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SWEET'S CATALOG FILE

A File of Manufacturers' Catalogs designed for the use of Architects, Engineers, Contractors and others whose practice it is to select, specify or purchase building materials, equipment and allied services.

SWEET'S CATALOG SERVICE

DIVISION OF F. W. DODGE CORPORATION

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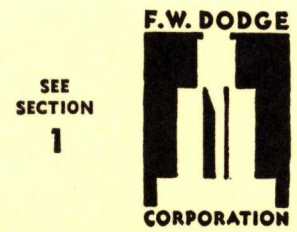

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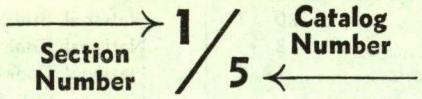

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- Air-Master 26/98
- **American Foundry & Furnace Co.** 26/83
- Arc-Eng 26/95
- **Auer Register Co.** 26/85
- **Barber-Colman Co.** 26/86
- Beco 7/37
- **Bennett Fireplace Co.** 26/137
- **Best Register Co.** 26/87
- **Carrier Corp.** 26/6
- **Diamond Mfg. Co.** 26/88
- Duo-Trol 26/98
- Effico 7/25
- Expanslip 26/137
- Fabrikated 26/92; 26/95
- **Ferro-Co Corp.** 26/100
- Governair 26/97
- H&C 26/91
- **Harrington & King Perforating Co.** 26/89
- **Hart & Cooley Mfg. Co.** 26/91
- **Heatilator Co.** 26/142
- **Hirschman, W. F., Co., Inc.** 7/25
- **Independent Register Co.** 26/92
- **Johnson Service Co.** 26/41
- **Knowles Mushroom Ventilator Co.** 26/93
- McKnight 26/96
- **Modine Mfg. Co.** 26/73
- Nu-Notch 26/93
- **Powers Regulator Co.** 26/43
- R. & G. 26/95
- RPM 7/29

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United States Register Co. 26/97
Waterloo Register Co. 26/98
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Calorider 26/22
Carrier Corp. 26/6
Fox Furnace Co., Div. of American Radiator & Standard Sanitary Corp. 26/13
Kathabar 26/24
Research Corp. 26/22
Sirocco 26/3
Surface Combustion Corp. 26/24
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Westinghouse Electric & Mfg. Co. 26/27
York Ice Machinery Corp. 26/31; 28/41

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Kason Hardware Corp. 28/42

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Anemostat Corp. of America ... 26/84

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Bennett Fireplace Co. 26/137
Covert, H. W., Co. 26/139
Donley Brothers Co. 26/140
Dutch Oven 26/140
Equal-Aire Incinerator Div. Sargent Building Specialities Co. .. 28/54
Ewing Incinerator Co. 28/55
Incinerite 28/63
Indiana Foundry Co. 26/144
K-M 28/57
Kellogg Mann Corp. 28/57
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Majestic Co. 26/145
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Peerless Mfg. Corp., Inc. 26/146
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G&G Hoist Corp. 26/130
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Armco 6/39
Ducturns 26/96
Reynolds Corp. 26/23
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Tuttle & Bailey, Inc. 26/96
Wood, Gar, Industries, Inc. 26/30

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Ash—Fireplace

Armored Concrete Corp. 13/52
Bennett Fireplace Co. 26/137
Covert, H. W., Co. 26/139
Donley Brothers Co. 26/140
Dutch Oven 26/140
Equal-Aire Incinerator Div. Sargent Building Specialties Co. .. 28/54
Indiana Foundry Co. 26/144
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Steam Power Plant

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American Blower Corp., Div. of American Radiator & Standard Sanitary Corp. 26/3
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See Fans—Ventilating or Exhaust

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EXTENSION

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See Hangers—Pipe—Hanger Iron for

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Attic Ventilating

See Ventilators—Attic Gable

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Blo-Fan 26/67
Emerson Electric Mfg. Co. 26/65
Guth, Edwin F., Co. 24/5
Guthfan 24/5
Junior 26/70
Pryne & Co., Inc. 26/67
Trade-Wind Motorfans, Inc. 26/70
Ty-Fandolier 14/19
Tyler, W. S., Co. 14/19
Warner Elevator Mfg. Co. 22/14
West Wind Corp. 26/71
Westwind Junior 26/71

Desk, Bracket or Ceiling—Electric Light Combination

Air-Lite 26/86
Barber-Colman Co. 26/86

Ventilating or Exhaust

(See also Ventilators — Wall— Fan Units; Ventilators—Roof—Fan)

American Blower Corp., Div. of American Radiator & Standard Sanitary Corp. 26/3
American Coolair Corp. 26/63
Breezo 26/4
Buffalo Forge Co. 26/4
Burnham Boiler Corp. 26/5
Clarage Fan Co. 26/7
Clay Equipment Corp. 21/92
Coolair 26/63
Emerson Electric Mfg. Co. 26/65
Forbes 7/34
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In-Bilt 26/62
Limit Load 26/4
Multivane 26/69
New Victor 26/62
Pacific Breeze 26/67
Pryanco 26/67
Pryne & Co., Inc. 26/67
Rexvane 26/69
Signal Electric Mfg. Co. 26/68
Silentvane 26/69
Sirocco 26/3
Sturtevant, B. F., Co. 26/69
Tri-Peller 7/34
Ventura 26/3
Victor Electric Products, Inc. 26/62
West Wind Corp. 26/71
Westwind Junior 26/71
Westwind Standard 26/71
Wing, L. J., Mfg. Co. 26/72
Wing-Scruplex 26/72
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Ventilating or Exhaust — Acid-proof

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Ventilating or Exhaust—Acid Resistant

Duriron Co., Inc. 27/15

Window—Ventilating

American Coolair Corp. 26/63
Clay Equipment Corp. 21/92
Coolair 26/63
Emerson Electric Mfg. Co. 26/65
Signal Electric Mfg. Co. 26/68
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West Wind Corp. 26/71
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Fox Furnace Co., Div. of American Radiator & Standard Sanitary Corp. 26/13
Holland Furnace Co. 26/15
Independent Air Filter Co. 26/125
Kompak 26/125
Permo Pad 26/125
Renu-Vent 26/124
Sturtevant, B. F., Co. 26/69
Throway 26/124
Trane Co. 26/25
Unimatic 26/124
See also 7/20

Air—Electrical Precipitation

Research Corp. 26/22

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Colonial Fireplace Co. 26/138
Donley Brothers Co. 26/140
Flexscreen 13/31; 26/137
Fyr-Slyd-Screen, Inc. 26/141
Jackson, Wm. H., Co. 26/143
Jones, Harold K., Co. 23/20

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FIREPLACE—Cont.

Accessories — Andirons, Fireset and Stands, Screens, Grates, Fenders, Woodholders — Cont.

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Lynch, Kenneth, Inc. 13/31
MacCormack 16/67
Rolling Screens, Inc. 16/67
Sloane, W. & J. 26/148
Sparkscreen 26/141
See also 13/35; 16/56; 26/146

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See Heaters—Air—Fireplace Units—Gas or Electric

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See Dumps—Ash—Fireplace

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See Doors—Ashpit, Trap or Clean-out

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See Dampers—Fireplace

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See Franklin Stoves

Gas Heaters

See Heaters—Air—Fireplace Units—Gas or Electric

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Grates—Electric

See Heaters—Air—Fireplace Units—Gas or Electric

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See Heaters—Air—Fireplace—Gas or Electric

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See Mantels

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Colonial Fireplace Co. 26/138
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See Dampers—Fireplace

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See Registers—Metal Frames for

Wall—Ventilator or Grille

Independent Register Co. 26/92
V-U 26/98
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Jackson, Wm. H., Co. 26/143
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Coal

National Coal Assn. 26/150

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See Stokers; Burners—Oil

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See 26/22

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Controls—Heating

See Dampers; Regulators

FURNACES—METALLURGICAL

Rust Engineering Co. 26/136

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(See also Boilers; Heaters—Unit)

Coal—Magazine Feed

Spencer Heater Div. Lycoming Mfg. Co. 26/118

Coal—Manually Fired

Air-Flo 26/17
Holland Furnace Co. 26/15
Lennox Furnace Co., Inc. 26/17
Mueller, L. J., Furnace Co. 26/21
Vaporaire 26/15

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Comfortrol-Iron Fireman 26/28
Comfortrol-Stoker 26/28
Holland Furnace Co. 26/15
Meyer Furnace Co. 26/18
Mueller, L. J., Furnace Co. 26/21
Vaporaire 26/15
Waterman-Waterbury Co. 26/28
Weir 26/18

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AGP 26/1
Aire-Flo 26/17
American Gas Products Corp., Div. American Radiator & Standard Sanitary Corp. 26/1
Capitolaire 26/121
Comfortrol Oil-O-Matic 26/28
Comfortrol—Seamless 26/28
Electrol Incorporated 26/10
Fox Furnace Co., Div. of American Radiator & Standard Sanitary Corp. 26/13
Gastite 26/28
Holland Furnace Co. 26/15
Janitrol 26/24
Lennox Furnace Co., Inc. 26/17
Meyer Furnace Co. 26/18
Mueller, L. J., Furnace Co. 26/21
Oilfyre 26/17
Sunbeam 26/13
Surface Combustion Corp. 26/24
United States Radiator Corp. 26/121
Vaporaire 26/15
Waterman-Waterbury Co. 26/28
Weir 26/18
Wood, Gar, Industries, Inc. 26/30

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Blo-Aire 26/18
Climator 26/21
Fluid Heat Div., Anchor Post Fence Co. 26/2
Meyer Furnace Co. 26/18
Mueller, L. J., Furnace Co. 26/21

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Gas Fired

Aire-Flo 26/17
Coleman Lamp & Stove Co. 26/8
Equator-Aire-Flo 26/17
Gas-Era 26/21
Holland Furnace Co. 26/15
Lennox Furnace Co., Inc. 26/17
Meyer Furnace Co. 26/18
Mueller, L. J., Furnace Co. 26/21
Vaporaire 26/15

Gravity Circulation—Coal, Gas or Oil Fired

AGP 26/1
American Gas Products Corp., Div. American Radiator & Standard Sanitary Corp. 26/1
Holland Furnace Co. 26/15
Janitrol 26/24
Meyer Furnace Co. 26/18
Surface Combustion Corp. 26/24
Vaporaire 26/15
Waterbury-Gastite 26/28
Waterbury Seamless 26/28
Weir 26/18
York Oil Burner Co. 26/123

Oil Fired

(See also Burners—Oil)
Aire-Flo 26/17
Comfortrol Oil-O-Matic 26/28
Fox Furnace Co., Div. of American Radiator & Standard Sanitary Corp. 26/13
Holland Furnace Co. 26/15
Lennox Furnace Co., Inc. 26/17
Meyer Furnace Co. 26/18
Sunbeam 26/13
Vaporaire 26/15
Waterman-Waterbury Co. 26/28
Weir 26/18
Wood, Gar, Industries, Inc. 26/30
York Oil Burner Co. 26/123

Wood Fired

Holland Furnace Co. 26/15
Meyer Furnace Co. 26/18
Vaporaire 26/15
Weir 26/18

FURNACES AND KILNS

Brick

Rust Engineering Co. 26/136
See also 26/132

Cement

See 3/1

GAGES

See Gauges

GAS

Fired Boilers

See Boilers—Heating—Gas Fired

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Anderson Products, Inc. 26/46
Brown 26/42
Everson Mfg. Co. 21/67
Gauge-Rite 26/46
Thrush, H. A., & Co. 26/44
Trane Co. 26/25
Webster, Warren, & Co. 26/45
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Water Level

Brown 26/42
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GOVERNORS

Steam Pump

Webster, Warren, & Co. 26/45

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Fireplace—Coal or Wood

Bennett Fireplace Co. 26/137
Donley Brothers Co. 26/140
Lynch, Kenneth, Inc. 13/31
Majestic Co. 26/145

Fireplace—Electric

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Shaking and Dumping

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Donley Brothers Co. 26/140
Washburn & Granger, Inc. 28/64
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High Velocity Air Diffuser

Anemostat Corp. of America 26/84

Radiator

See Grilles and Screens; Radiator—Covers and Cabinets

GRILLES AND SCREENS

Heating, Ventilating or Air Conditioning — Cast, Stamped, Perforated and/or Woven Metal

Airline 26/96
Air-Master 26/98
American Foundry & Furnace Co. 26/83
Arc-Eng 26/95
Auer Register Co. 26/85
Barber-Colman Co. 26/86
Bennett Fireplace Co. 26/137
Best Register Co. 26/87
Carrier Corp. 26/6
Clinton 26/99
Co-Pilot 26/98
Covert, H. W., Co. 26/139
Croscane 26/99
Desco 19/4
Detroit Show Case Co. 19/4
Kmpc 20/35
Diamond Mfg. Co. 26/88
Disc-Loc 26/93
Donley Brothers Co. 26/140
Fabrikated 26/92; 26/95
Ferro-Co Corp 26/100
Flexair 26/96
Fox Furnace Co., Div. of American Radiator & Standard Sanitary Corp. 26/13
H&C 26/91
Harrington & King Perforating Co. 26/89
Hart & Cooley Mfg. Co. 26/91
Heatilator Co. 26/142
Hendrick Mfg. Co. 29/90
Kawneer Co. 19/7
Kentucky Metal Products Co., Inc. 20/35
Knowles Mushroom Ventilator Co. 26/93
Independent Register Co. 26/92
Industro 20/36
Mitco 11/98
Modine Mfg Co. 26/73

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GRILLES AND SCREENS—Cont.

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Multiflector 26/25
Panelouvre 16/89
Pilot 26/98
Quaker City Metal Products Corp. 26/101
R. & G. 26/95
Reg-Gril-Co. 26/95
Register & Grille Mfg. Co., Inc. 26/95
Skyline 26/98
Superior Fireplace Co. 26/149
T & B 26/96
Trane Co. 26/25
Tuttle & Bailey, Inc. 26/96
U.S. 26/97
Uni-flo 26/86
United States Register Co. 26/97
Ventilouvre Co., Inc. 16/89
Waterloo-Airmaster 26/98
Waterloo Register Co. 26/98
Western Wire & Iron Works, Inc. 20/36
Wickwire Spencer Steel Co. 26/99; 26/102
Wiscane 26/99
Wissco 26/99
Zouri 19/12
See also 26/94
Specifications 26/6; 26/99

HANGERS

Pipe

(Including Ring and Bolt; Wire Hooks; Adjustable, Strap, Sprinkler, etc.)
Grinnell Co., Inc. 26/75
Hussey, C. G., & Co. 13/9
Paine Co. 16/53
Porter, H. W., & Co., Inc. 26/81
Ric-wiL Co. 26/82
Romex 16/53
U.F.S. 26/75
See also 26/103

Pipe Coil

Maforco 28/43
Market Forge Co. 28/43

Pipe—Hanger Iron for

Paine Co. 16/53

Radiator

A-Just-Rite 26/46
Anderson Products, Inc. 26/46
E-Z 26/105
Healy-Ruff Co. 26/105
Paine Co. 16/53
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Specifications 26/105

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Unit Heater

Grinnell Co., Inc. 26/33

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Æolus Dickinson Industrial Div. Paul Dickinson, Inc. 7/19
Dickinson 7/19
Ferrocast 7/19

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Exchangers, Interchangers, Economizers, etc.

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AGP 26/1
American Gas Products Corp., Div. American Radiator & Standard Sanitary Corp. 26/1
Filtrine Mfg. Co. 27/51

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York Ice Machinery Corp. 28/41
Young Radiator Co. 26/35
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Regulators

See Controllers—Temperature; Thermostats; Regulators—Damper

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Air—Convector Type

See Radiators—Convector Type

Air—Electric—Auxiliary or Bathroom

Adam, Frank, Electric Co. 23/13
Biltin 27/97
F-A 23/13
Fairfacts Co., Inc. 27/97
Prometheus Electric Corp. 28/23
Quikheter 23/13
Thermador Electrical Mfg. Co. . . 26/34

Air—Electric—Portable

Adam, Frank, Electric Co. 23/13
F-A 23/13
Quikheter 23/13

Air—Fireplace Units—Gas or Electric

Bennett Fireplace Co. 26/137
Colonial Fireplace Co. . . 26/138
Covert, H. W., Co. 26/139
Donley Brothers Co. 26/140
Glo-Hot 26/138
Heatilator Co. 26/142
Heatsaver 26/140
Majestic Co. 26/145
Peerless Mfg. Corp., Inc. 26/146
Victor 26/138
Prometheus Electric Corp. 28/23
Radiheater 26/139
Superior Fireplace Co. 26/149

Air—Warm Air Furnaces

See Furnaces—Warm Air

Air Conditioning

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Convector Type

See Radiators—Convector Type

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Fireplace

See Heaters—Air—Fireplace

Furnace Type

See Furnaces—Warm Air

Garage—Electric

See Heaters—Air—Electric—Portable

Oil Fuel

Anthony Company 26/106
See also 27/45; 27/46; 27/50

Radiator—Electric

Prometheus Electric Corp. 28/23

Radiators—Gas

AGP 26/1
American Gas Products Co. 26/1

Unit—Boiler or Furnace Only—Coal, Gas or Oil Fired

(See also Oil Burners and/or Equipment; Boilers—Heating; Furnaces)

AGP 26/1
American Gas Products Corp., Div. American Radiator & Standard Sanitary Corp. 26/1
Crane Co. 26/111

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HEATERS—Cont.

Unit—Boiler or Furnace Only—Coal, Gas or Oil Fired—Cont.

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Electrol-American 26/10
Electrol Incorporated 26/10
Electrol-Kewanee 26/10
Heat-An-Aire 26/19
Ideal-Empire 26/1
May Oil Burner Corp. 26/19
Oil-O-Matic 26/29; 26/122
Williams Oil-O-Matic Heating Corp. 26/29; 26/122

Unit—Boiler or Furnace—Coal, Gas or Oil Fired—Fan or Blower, Air Washer, Moistener and/or Filter

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AGP 26/1
Aire-Flo 26/17
American Blower Corp., Div. of American Radiator & Standard Sanitary Corp. 26/3
American Gas Products Corp., Div. American Radiator & Standard Sanitary Corp. 26/1
Boiler-Air Conditioner 26/12
Capitolaire 26/121
Carrier Corp. 26/6
Clarage Fan Co. 26/7
Comfortrol 26/28
Comfortrol Oil-O-Matic 26/28
Comfortrol-Seamless 26/28
Conditionair 26/9
Delco-Frigidaire Conditioning Division, General Motors Corp. . . 26/9
DeLuxe 26/14
Electrol Incorporated 26/10
Fairbanks, Morse & Co. 26/11
Fitzgibbons Boiler Co., Inc. 26/12
Fitzgibbonsaire 26/12
Fluid Heat Div., Anchor Post Fence Co. 26/2
Fox Furnace Co., Div. of American Radiator & Standard Sanitary Corp. 26/13
Heat-An-Aire 26/19
Heil Co. 26/14
Holland Furnace Co. 26/15
Janitrol 26/24
Johnson, S. T., Co. 26/113
Kathabar 26/24
Lennox Furnace Co., Inc. 26/17
May Oil Burner Corp. 26/19
Meyer Furnace Co. 26/18
Multitherm 26/7
Oil-O-Matic 26/29
Oilfyre 26/17
Reynolds Corp. 26/23
Selectair 26/113
Sunbeam 26/13
Surface Combustion Corp. 26/24
Tempered-Aire 26/30
United States Radiator Corp. . . 26/121
Venturafin 26/3
Waterman-Waterbury Co. 26/28
Weir 26/18
Williams Oil-O-Matic Heating Corp. 26/29
Wood, Gar, Industries, Inc. 26/30
York Ice Machinery Corp. 26/31
York Oil Burner Co. 26/123
See also 16/113; 26/66

Unit—Indirect Heat—Gas Fired

AGP 26/1
American Gas Products Corp., Div. American Radiator & Standard Sanitary Corp. 26/1
Buffalo Forge Co. 26/4
Janitrol 26/24
Surface Combustion Corp. 26/24
Unit-Or 26/1

Unit—Indirect Heat with Blower or Fan

American Blower Corp., Div. of American Radiator & Standard Sanitary Corp. 26/3
Boiler-Air Conditioner 26/12
Carrier Corp. 26/6
Featherfin 26/72
Featherweight 26/72
Fedders Mfg. Co. 26/32
Fitzgibbons Boiler Co., Inc. 26/12
Fitzgibbonsaire 26/12
Giant 26/45
Grinnell Co., Inc. 26/33
Ilg Electric Ventilating Co. 26/66
Janitrol 26/24
Kroy 26/6
Rexvane 26/69
Rome-Turney Radiator Co. 26/74
Speed Heater 26/69
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WOVEN

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AGP

THE WORLD'S LEADING MANUFACTURER OF

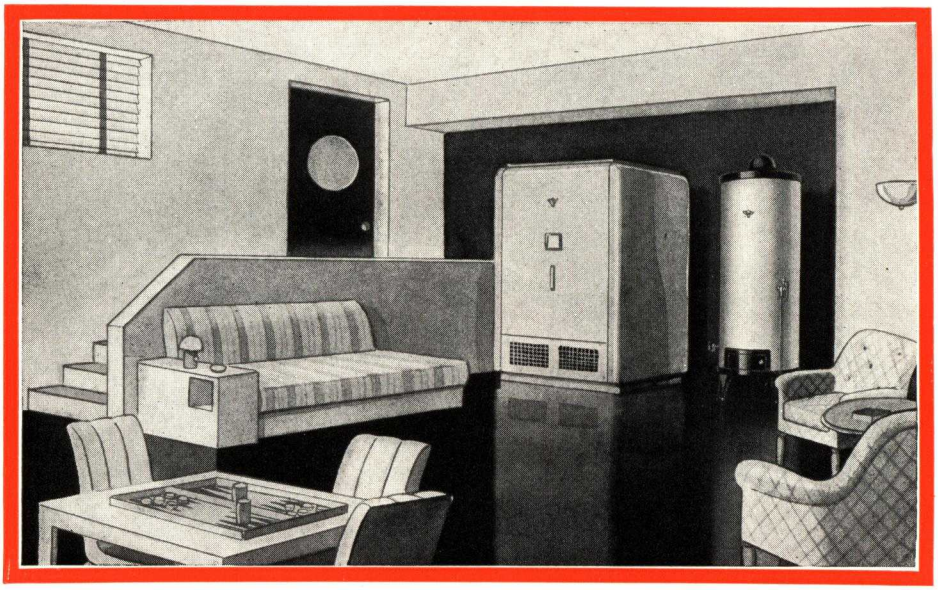
AMERICAN GAS PRODUCTS CORP.
DIVISION OF
AMERICAN RADIATOR & STANDARD SANITARY CORP.
NEW YORK

GAS

HEATING, HOT WATER and AIR CONDITIONING APPLIANCES

AGP Automatic Gas-Fired Heating Equipment

By—



AGP automatic gas-fired equipment permits conversion of basement space to useful living area. Accompanying illustration shows an AGP Empire Ideal Boiler and an AGP Clipper Water Heater. The attractive gun-metal baked enamel finish of the equipment, complete elimination of soot, dirt and fuel storage, and automatic control transform the old dusty basement to a room for study and recreation.

AGP Gas-fired Automatic Heating Equipment is manufactured in an inclusive range of types and sizes for serving every domestic heating need. Any type of heating medium—steam, vapor, water and air—may be used with AGP gas-fired equipment. In addition to complete combinations of equipment designed for original installations, a line of gas convertors is manufactured for converting installed coal or oil-fired boilers or furnaces to automatic gas-fired systems.

CHARACTERISTICS OF GAS-FIRED HEATING

Gas-fired heating differs essentially from other types of heating in (1) cleanliness; (2) flexibility and greatest adaptability to automatic control; and (3) constant efficiency. Because of the nature of gas the process of combustion, once started, may be controlled automatically and mechanically maintain a desired room temperature with room thermostat controlling the operation of a valve. The efficiency of gas-fired boilers is very nearly constant, the A.G.A. approval gives a gas boiler output rating of 80% of the input.

COMPARATIVE ECONOMY

Cost of heating by gas will vary with the rate structure of the gas utility operating in a given locality, on the Btu content of the gas, climatic conditions and type and quality of building construction. Cost comparison with other fuels will likewise vary widely with specific local factors, such as the relative efficiencies of the different fuels, and the delivered efficiencies of the operating installations selected for comparison.

Gas-fired equipment, because of its relatively high efficiency, shows especially favorable results when used to heat spaces fully provided with building insulation. In addition, those items of expense which are not immediately apparent, are either entirely eliminated or are considerably diminished. Among such items are: Labor (attention to heating plant, emergency repair service, etc.); Service charges for adjusting and cleaning burners, flues, etc.; Equipment costs and depreciation; Electric charges for operating motors, fans and other accessories; and such intangible but important items as omission of basements, or basement space made available for living or recreational quarters.

RANGE OF PRODUCTS AND APPLICATION

The complete range of AGP products is described in these sheets. Full descriptions, capacity ratings, specifications, overall dimensions, data on controls and recommendations for installation are given in the following pages:

AGP Ideal Standard and AGP Ideal Empire Gas-Fired Boilers for any steam, vapor or hot water heating system or for a hot water supply system, either direct or indirect. See pages 4 and 5.

AGP Air Conditioners Type 2-FE and Type K for complete automatic filtered and humidified warm-air heating by forced circulation. See Pages 6 and 7 and 8 and 9.

AGP Gas-Fired Floor Furnace for ductless warm air heating by gravity circulation. See page 8.

AGP Gas-Fired Gravity Furnaces for warm air heating without forced circulation. See page 9.

AGP Gas Convertors for converting existing coal or oil-fired boilers on steam, vapor or hot water systems to completely automatic gas-fired units. See page 9.

AGP Water Heaters for automatic storage type domestic hot water supply. See pages 10 and 11.

*

SELECTION OF GAS-FIRED EQUIPMENT

Heat-generating capacity of gas-fired equipment can be predicted accurately within one or two percent and is not affected by condition of fuel bed or soot accumulation. Consequently all gas equipment is rated according to hourly Btu output, namely amount of steam or hot-water heat available at outlet of boiler, or warm-air heat at bonnet of furnace. Btu output rating is based on approved American Gas Association Btu input rating and A.G.A. approved average efficiency.

Output ratings may be converted to equivalent steam radiation by dividing by 240, and to equivalent water radiation by dividing by 150.

All AGP equipment is rated on the following pages according to A.G.A. output ratings (either in Btu/hr. or sq. ft. of radiation), and also according to square feet of direct C.I. radiation supplied. The latter rating is arrived at by deducting from the first, factors for piping load loss and starting load as approved by the A.G.A.

To select AGP equipment of proper capacity, calculate total heat loss in Btu of space to be heated, according to standard methods.

This total heat loss, expressed in Btu or square feet of radiation, should be equal to or not greater than AGP rating for square feet of direct C.I. radiation supplied (in the case of a steam or water boiler) and equal to or not greater than output at registers (in the case of a warm-air furnace).

For preliminary calculation or quick check on the adequacy of a boiler in buildings where glass area does not exceed ¼ of

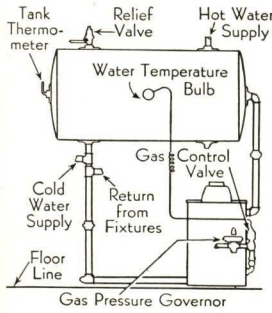
*AGP Gas-fired Steam Radiators and Unit-Ors for vented or non-vented direct space heating. See Pages 8 and 9.

AMERICAN GAS PRODUCTS CORPORATION 40 WEST 40TH STREET
DIVISION OF AMERICAN RADIATOR & STANDARD SANITARY CORPORATION NEW YORK, N.Y.

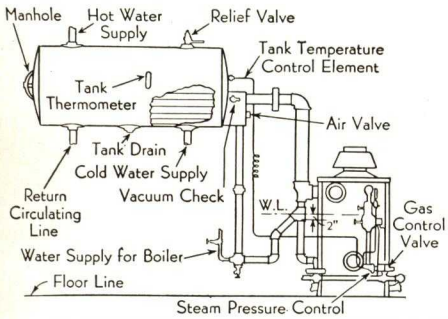
AGP Automatic Gas-Fired Heating Equipment

By AGP

I - DOMESTIC HOT WATER SUPPLY

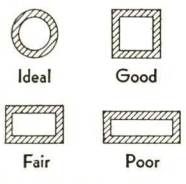


DIRECT SYSTEM
D W Equipment
Boiler directly connected to storage tank. Recommended boilers: Types 1-GA, 2-GA, 4-GA

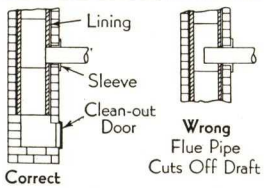


INDIRECT SYSTEM
I S Equipment
Heat Exchanger used (Excelso type or submerged pipe coil)

II - FLUE RECOMMENDATIONS



FLUE SHAPES



FLUE CONNECTIONS

FLUE SIZES

Boiler No.	Diameters (inches) Round Flues for Chimney Hts. of: *10'	40'	70'	Boiler No.	Diameters (inches) Round Flues for Chimney Hts. of: *10'	40'	70'
0-G- 4	5	5	5	4-G-22	23	20	16
0-G- 5	5	5	5	4-G-25	24	20	16
0-G- 6	6	6	6	4-G-28	26	20	16
0-G- 7	6	6	6	4-G-31	26	22	20
1-G- 4	6	6	5	4-G-33	28	22	20
1-G- 5	7	7	6	4-G-37	30	22	22
1-G- 6	8	7	7	4-G-41	32	24	22
1-G- 7	8	8	7				
1-G- 8	8	8	8	*2 Boilers*			
1-G- 9	9	9	8	4-G-21	31	24	20
1-G-10	9	9	8	4-G-22	32	26	21
1-G-11	10	9	9	4-G-25	34	26	23
				4-G-28	36	28	24
4-G- 6	11	10	9	4-G-31	38	28	26
4-G- 7	12	10	10	4-G-33	40	28	26
4-G- 8	13	11	10	4-G-37	42	30	28
4-G- 9	14	11	10	4-G-41	45	30	28
4-G-10	15	12	11				
4-G-11	16	13	12	*3 Boilers*			
				4-G-28	45	32	28
4-G-13	17	14	12	4-G-31	48	32	30
4-G-15	18	14	13				
4-G-17	20	15	14	4-G-33	50	32	30
4-G-19	21	16	15	4-G-37	52	34	32
4-G-21	22	18	15	4-G-41	55	36	34

* Flue sizes for 10-foot chimneys are for special installations where greater height is impossible or impracticable. Not recommended for general practice

Heights are measured from the boiler.

If other than round flues are used the area must be the effective equivalent of the round flue

total wall area, the following (adapted from Mills' Rule) will be found useful.

$$\text{Sq. Ft. of steam radiation} = \frac{G}{2} + \frac{W}{20} + \frac{C}{200}$$

$$\text{Sq. Ft. of hot water radiation} = \left(\frac{G}{2} + \frac{W}{20} + \frac{C}{200}\right) \times 1.6$$

G = area of glass in square feet.
W = net area of exposed wall (plus floors and ceilings if exposed).
C = content of building in cubic feet.

SPECIFICATION

When ordering AGP equipment, the following information should always be specified: (1) Identifying number and symbol of equipment unit; (2) Identifying number(s) and symbol(s) of control equipment; (3) Characteristics of available gas supply; type (manufactured, natural or mixed), Btu content, specific gravity and pressure; (4) Characteristics of available electric energy: voltage, phase and cycle where electric room temperature controls are involved.

A short form specification will be found adequate as follows: "Furnish and install according to manufacturer's instructions, where shown on the plans an Empire Ideal (or Standard Ideal) Steam (or Water) Gas Boiler with an A.G.A. output rating of ....sq. ft. of radiation. The boiler shall be manufactured by the American Radiator Company and shall be completely equipped with Type .... Equipment consisting of ..... (list items of equipment)".

This should be supplemented with paragraphs governing installation of gas supply, piping, ductwork, connections, tests, etc., as required.

INSTALLATION

Installation of all AGP equipment should conform to the following standards of good practice:

Location should allow proper clearances for all connections and controls and permit servicing. Where in a confined space, a suitable opening to outside air, 144 square inches in the clear, for the average residence installation, should be provided for adequate air supply.

Gas connection: at least equal in size to governor size with minimum number of bends and in accordance with recommendations of the local utility.

Governor vent connection: ¼" vent piping from relief opening in governor to outside point 3' above ground, with elbow faced downward, or as directed by local utility.

Flue connection: not less than full size of opening at draft-diverter and pitched upward from unit connection to flue. Separate flue to be provided, without other connection to flue.

Water connection: where required, should include valve or stop-cock close to unit.

Duct system: where required, ducts should be galvanized iron or steel with double locked seams and jointed with standard "S" drive clips. Rectangular ducts shall be in accordance with the following table:

Gauge	Width of Duct	Seam	Reinforced Seam
26	Up to 12 inches	1"	
24	13" to 30"	1"	⅛" x 1"
22	31" to 48"	1"	⅛" x 1"
22	49" to 60"	1½"	⅛" x 1⅜"
20	61" to 90"	1½"	⅛" x 1⅜"

Where ducts pass through walls or partitions, opening shall clear duct metal by 1". Where necessary to change elevation of a duct, change should be as near 30° from horizontal as possible.

Piping: Adequate and rapid venting of air from steam heating systems is recommended to give maximum economy and minimum temperature variation.

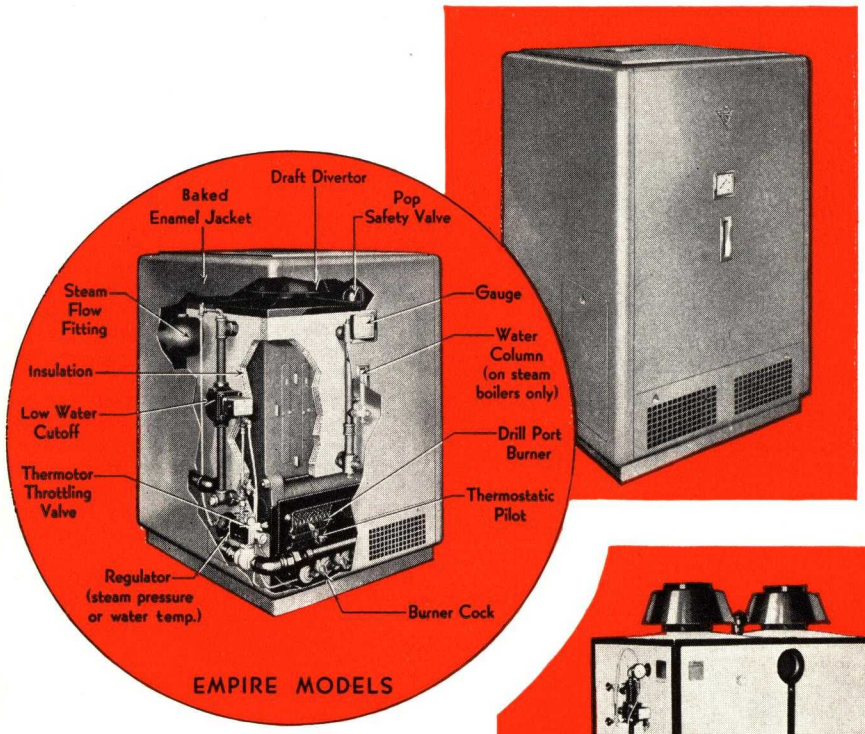
Insulation: Insulation of pipe lines in steam and hot water systems tends to cut down pipe losses and increase the efficiency of the system. Ducts run through unheated garages or unexcavated portions of basement should be insulated with 1" air cell asbestos or equal. Warm air risers, if on outside walls, should be insulated with 1½" air cell asbestos. Other warm air risers should be covered with asbestos paper.

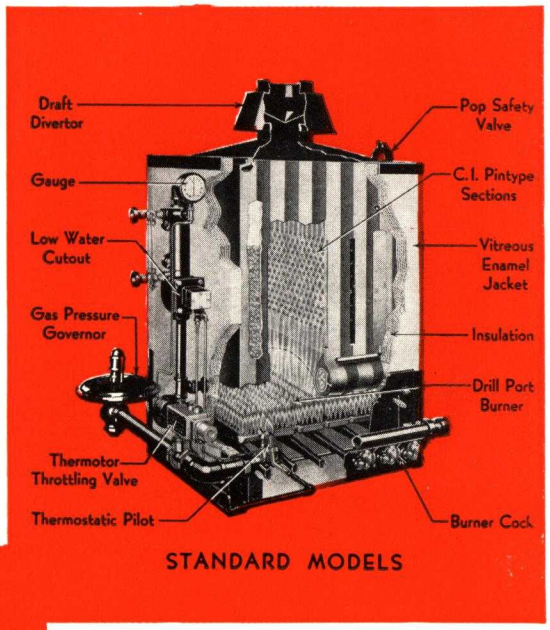
Flues: A flue of adequate size and proper construction is essential to remove products of combustion from boiler room. Chimneys should be of good construction, preferably lined with glazed tile or terra cotta with carefully filled cement mortar joints. For recommendations on sizes and shapes refer to Table I.

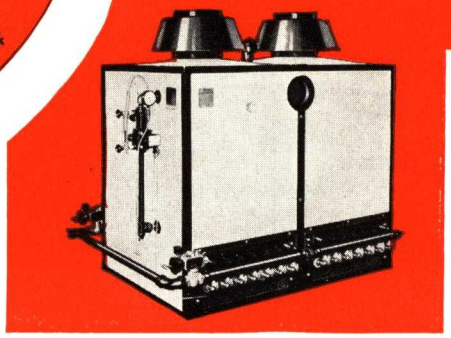
40 WEST 40TH STREET NEW YORK, N.Y.
AMERICAN GAS PRODUCTS CORPORATION
DIVISION OF AMERICAN RADIATOR & STANDARD SANITARY CORPORATION

AGP Gas Fired Steam & Hot Water Boilers

By___







AGP Empire Ideal Type Boilers are illustrated top center and in phantom view above. All projections are eliminated, and controls and connections encased in a baked enamel jacket. AGP Standard Ideal Type Boilers are illustrated at the right, and in phantom view at extreme right.

DESCRIPTION

Two general types of AGP automatic gas-fired boilers are manufactured for use with hot water, vapor or steam heating systems: AGP **Standard Ideal,** with exposed trim and connections, and AGP **"Empire" Ideal,** with all controls completely enclosed in a baked-enamel cabinet type jacket, and connections arranged on the rear surface so that pipes and flues may be furred into the wall.

Forty-seven sizes are available with an output range of 163 to 11,430 square feet of direct cast-iron steam radiation; and 135 to 18,286 square feet of direct cast-iron water radiation.

Basic equipment of each unit consists of a raised drilled port burner with gas valve electrically operated from a room thermostat and mechanically controlled by steam pressure or water temperature; heat-absorbing surface of patented Pintype C.I. sections; acid-proof vitreous enamel finished canopies and divertor; and enamelled jacket insulated with cellular composition asbestos.

Controls. All control functions of AGP Ideal boilers are centered in the **AGP Thermotor Throttling Valve** which gradually reduces gas consumption as desired steam pressure or water temperature is reached. The thermotor operates from the room thermostat and embodies a mechanical limit control. Related controls include: **Low Water Cut-off** for shutting off gas supply to main burners if water line on steam boilers reaches a low point; **Steam Pressure or Water Temperature Regulator,** for controlling supply of gas to burners according to predetermined pressure or temperature; **Gas Pressure Governor,** for maintaining gas pressure at a fixed maximum; **Thermostatic Pilot** for closing gas supply valve should pilot light be extinguished. Throttling, limit and safety pilot controls function independently of current, and valve may be operated manually in the event of current failure. Controls are integrated so as to furnish completely automatic heat without manual control.

Domestic Hot Water is supplied by AGP Ideal Boilers by means of a DW (direct water) or IS (indirect steam) system. DW system uses a direct-connection to storage tank in which temperature of the water is controlled by means of a water-temperature bulb attached to main gas-control valve with a 10 foot capillary tube. Temperature of water in the storage tank may be set by means of a dial. Valve operates either as throttling or snap-action valve.

Equipment for DW system includes: Boiler with gas-control valve, thermostatic pilot and gas-pressure governor, thermometer and temperature-pressure relief valve for storage tank. Boilers in types 1-GA, 2-GA, and 4-GA in Table I are recommended for use with DW systems and are tested to 200 lbs.

IS system uses pipe-coil or Excelso indirect water heater to transmit heat generated by steam boiler to water in storage tank. Boiler operates at constant efficiency and normal low pressure. Temperature of the water in the tank is controlled by means of an immersion element connected to main gas-control valve with 10-foot capillary tube. Temperature of the water may similarly be set by means of dial.

Equipment for IS system is similar to that for DW system plus low-water cut-off. Boilers in types O-GS, 1-GS and 4-GS are all recommended for use with IS systems.

SELECTION AND SPECIFICATION

AGP boilers should be selected in accordance with procedure outlined on page 2. Specification should include general information listed on page 2 in addition to all items of equipment appropriate for steam or water boiler as selected, i.e., steam pressure or water temperature regulator, compound steam gauge or combination altitude gauge and thermometer, etc.

INSTALLATION

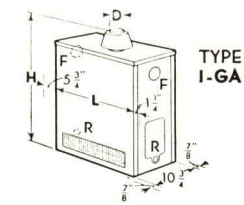
Installation should conform to good practice recommendations listed on page 3.

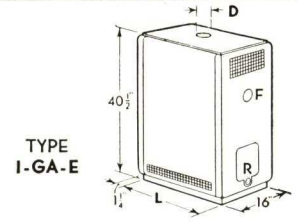
AMERICAN GAS PRODUCTS CORPORATION 40 WEST 40TH STREET
DIVISION OF AMERICAN RADIATOR & STANDARD SANITARY CORPORATION NEW YORK, N.Y.

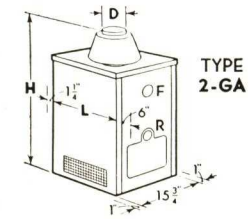
AGP Gas Fired Steam & Hot Water Boilers

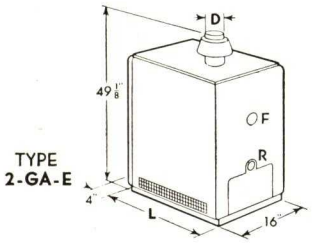
By— AGP AMERICAN GAS PRODUCTS CORP.

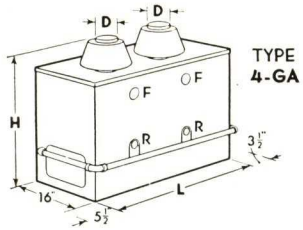
RATINGS, DIMENSIONS and CLEARANCES

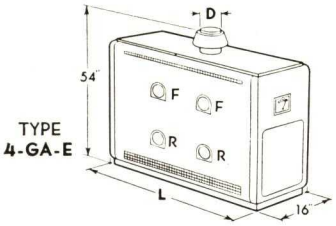


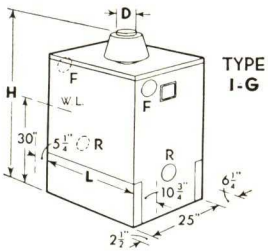


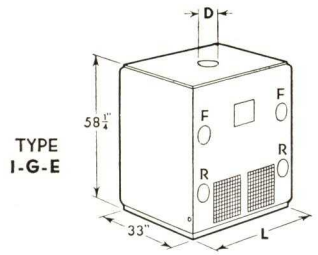


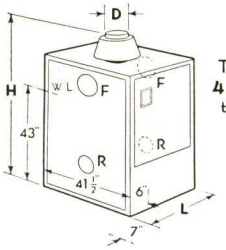


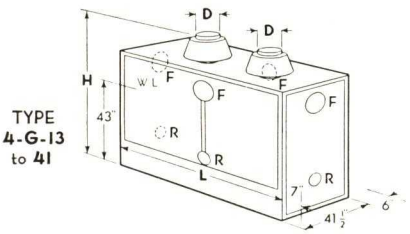






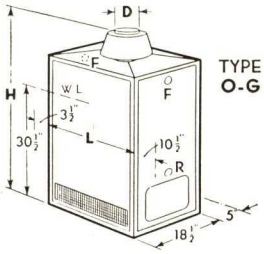


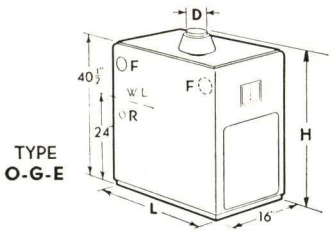




* **4-G-6** to **4-G-11** - 2 - 6" Flows; 2 - 5" Returns
4-G-13 to **4-G-21** - 4 - 6" Flows; 3 - 5" Returns

4-G-22 to **4-G-31** - 6 - 6" Flows; 4 - 5" Returns
4-G-33 to **4-G-41** - 8 - 6" Flows; 5 - 5" Returns





BOILER NUMBER	RATINGS - Sq. Ft. Radiation				Dimensions (inches)		D Diam. FLUE (inches)
	HOT WATER		STEAM				
	AGA Output	Supplies Installed	AGA Output	Supplies Installed	L	H	
TYPE 1-GA for Water Only - 2 - 1½" Flow Connections; 2 - 1½" Returns							
1-GA-4	210	135			13¾	37¼	3
1-GA-5	280	180			16¾	37¼	4
1-GA-6	350	225			19¾	37¼	4
1-GA-7	420	270			22¾	39	5
TYPE 1-GA-E for Water Only - 1 - 1½" Flow Connection; 1 - 1½" Return							
1-GA-4-E	210	135			19¼	40½	3
1-GA-5-E	280	180			22¼	40½	4
1-GA-6-E	350	225			25¼	40½	4
1-GA-7-E	420	270			28¼	40½	5
TYPE 2-GA for Water Only - 1 - 2½" Flow Connection; 1 - 2½" Return							
2-GA-4	420	270			13¾	42¼	5
2-GA-5	560	359			16¾	42¼	5
2-GA-6	700	449			19¾	42¼	6
2-GA-7	840	539			22¾	42¼	6
TYPE 2-GA-E for Water Only - 1 - 2½" Flow Connection; 1 - 2½" Return							
2-GA-4-E	420	270			19¼	49⅛	5
2-GA-5-E	560	359			22¼	49⅛	5
2-GA-6-E	700	449			25¼	49⅛	6
2-GA-7-E	840	539			28¼	49⅛	6
TYPE 4-GA for Water Only - 2 - 2½" Flow Connections; 2 - 2½" Returns							
4-GA- 9	1120	725			29	42½	2-5
4-GA-11	1400	915			35	42½	2-6
4-GA-13	1680	1109			41	42½	2-6
TYPE 4-GA-E for Water Only - 2 - 2½" Flow Connections; 2 - 2½" Returns							
4-GA- 8-E	980	630			37¼	54	7
4-GA- 9-E	1120	725			40¼	54	7
4-GA-11-E	1400	915			46¾	54	8
4-GA-13-E	1680	1109			52¼	54	8
TYPE 1-G for Steam or Water - 2 - 4" Flow Connections; 2 - 4" Returns							
1-G- 4	980	631	610	391	19	51	6
1-G- 5	1240	807	775	497	23	55½	7
1-G- 6	1500	980	940	606	27	54¼	8
1-G- 7	1770	1168	1105	715	31	54¾	8
1-G- 8	2030	1353	1270	826	35	55¾	8
1-G- 9	2300	1598	1435	938	39	58½	9
1-G-10	2560	1739	1600	1050	43	59¼	9
1-G-11	2820	1935	1765	1165	47	59¾	10
TYPE 1-G-E for Steam or Water - 2 - 4" Flow Connections; 2 - 4" Returns							
1-G- 4-E	980	631	610	391	32	58¼	6
1-G- 5-E	1240	807	775	497	36	58¼	7
1-G- 6-E	1500	980	940	606	40	58¼	8
1-G- 7-E	1770	1168	1105	715	44	58¼	8
1-G- 8-E	2030	1353	1270	826	48	58¼	8
1-G- 9-E	2300	1598	1435	938	52	58¼	9
1-G-10-E	2560	1739	1600	1050	56	58¼	9
TYPE 4-G for Steam or Water - 6" Flow Connections; 5" Returns For number of connections see *							
4-G- 6	3200	2214	2000	1332	27	70	11
4-G- 7	3840	2676	2400	1624	31	70¾	12
4-G- 8	4480	3151	2800	1922	35	73	13
4-G- 9	5120	3634	3200	2214	39	73¾	14
4-G-10	5760	4114	3600	2505	43	75½	15
4-G-11	6400	4571	4000	2793	47	76	16
4-G-13	7680	5486	4800	3387	61¼	70¾	2-12
4-G-15	8960	6400	5600	4000	69¼	73	2-13
4-G-17	10240	7314	6400	4570	77¼	73¾	2-14
4-G-19	11520	8230	7200	5143	85¼	75½	2-15
4-G-21	12800	9143	8000	5714	93¼	76	2-16
4-G-22	13440	9600	8400	6000	103½	73	3-13
4-G-25	15360	10970	9600	6857	115½	73¾	3-14
4-G-28	17280	12343	10800	7714	127½	75½	3-15
4-G-31	19200	13714	12000	8570	139½	76	3-16
4-G-33	20480	14625	12800	9145	153¾	73¾	4-14
4-G-37	23040	16457	14400	10285	169¾	75½	4-15
4-G-41	25600	18286	16000	11430	185	76	4-16
TYPE O-G for Steam Only - 2 - 2½" Flow Connections; 1 - 1½" Return							
0-G-4			270	173	14	53	4
0-G-5			360	230	17	54	5
0-G-6			450	289	20	54	6
0-G-7			540	346	23	54	6
TYPE O-G-E for Steam Only - 3" Flow Connections; 1½" Returns (1 each, Nos. 4 to 6; 2 F, 1 R, Nos. 7 to 11)							
0-G- 4-E			255	163	29	51¾	5
0-G- 5-E			340	218	33	52¼	5
0-G- 6-E			425	272	37	51¾	6
0-G- 7-E			510	327	41	52¼	6
0-G- 9-E			680	436	49	54¼	7
0-G-11-E			850	545	57	54¼	8

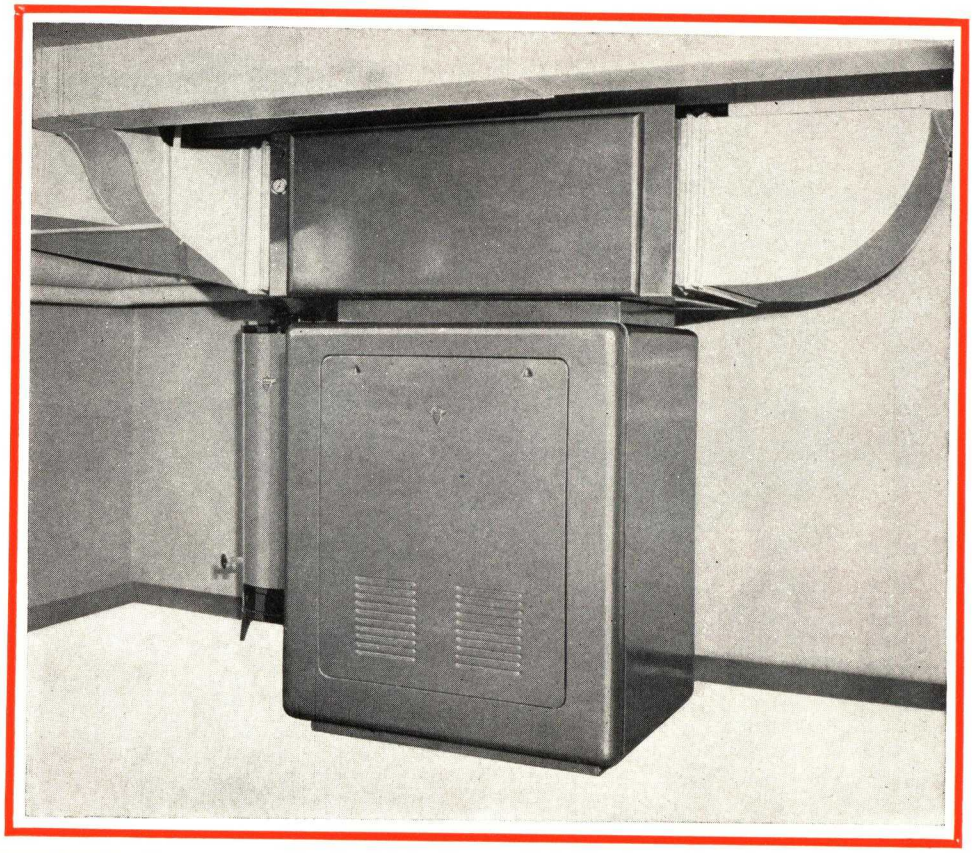
40 WEST 40TH STREET
NEW YORK, N.Y.
AMERICAN GAS PRODUCTS CORPORATION
DIVISION OF AMERICAN RADIATOR & STANDARD SANITARY CORPORATION

AGP Gas-Fired Air Conditioners

By—

The AGP Type 2-FE air conditioner is a direct, gas-fired mechanical furnace which provides completely automatic, central, recirculating warm-air heating. Air is filtered, heated, humidified, delivered and returned through ducts by means of forced circulation.

The Conditioner is completely encased in an Empire type jacket of furniture steel finished in gun-metal enamel, and contains (a) *Heating Unit* consisting of cast-iron cored sections forming an efficient heating element with a single combustion chamber under the same jacket alongside the heating sections, a plenum compartment containing the humidifier, and (b) *Fan Motor Unit* mounted above the Heating Unit, the two units operating on the Counter Flow Principle of heat transfer. Air is blown down over the outer surfaces of the heating sections in opposition to the upward flow of hot gases on the inside of the heating surface, affording a high efficiency of heat transfer with minimum heating surface. For domestic hot water equipment recommended for use in combination with the AGP air conditioner see Page 10.



EQUIPMENT AND CONTROLS

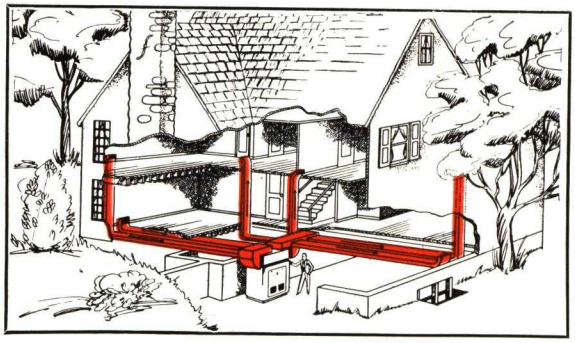
Gas Burners and Gas Valves. Standard AGP burner equipment is used with a Thermotor Throttling valve, and single thermostatic pilot. Gas supply to burners is directly controlled by room thermostat, while air discharge temperature is automatically and mechanically controlled by temperature throttling element. In addition, the stack limit control, a non-resetting safety control located in the flue, shuts off supply of gas to the thermostatic pilot and thus closes the main valve should the flue temperature exceed a predetermined maximum.

Fan Motor Unit has intake and discharge connections on opposite sides, for horizontal duct connections. It contains air filters of the Arco cellular replacement type, made of corrugated fibre board, viscous-coated, and an American Blower "Sirocco" squirrel cage fan mounted on rigid steel frame with rubber vibration dampeners. It may be erected with intake or outlet to conditioned space on either right or left side of assembled unit.

Fan Control. The fan is operated by a heat-operated stack fan switch, which turns fan on in advance of final limit of flue temperature, while thermal efficiency is relatively high, and turns fan off when flue temperature has dropped to point at which little stored heat remains in heating sections.

Humidifier Equipment. Humidification is supplied in a standard assembly by means of an evaporating plate humidifier, with adjustable water feed. Spray humidifier equipment with solenoid valve and humidistat is available as optional equipment for automatic control of humidity.

Instrument Panel. All controls are mounted on a panel placed over the front of the inner casing, and readily accessible by removal of front jacket panel.



A typical installation of the AGP Air Conditioner is shown above, with return and discharge duct connections. Heating unit, controls and fan-motor unit are completely encased in a lustrous enamel jacket. Diagram at the left shows a typical air conditioning duct system outlined in red. Except for the compact area occupied by the Air Conditioner, the entire basement is available for living area.

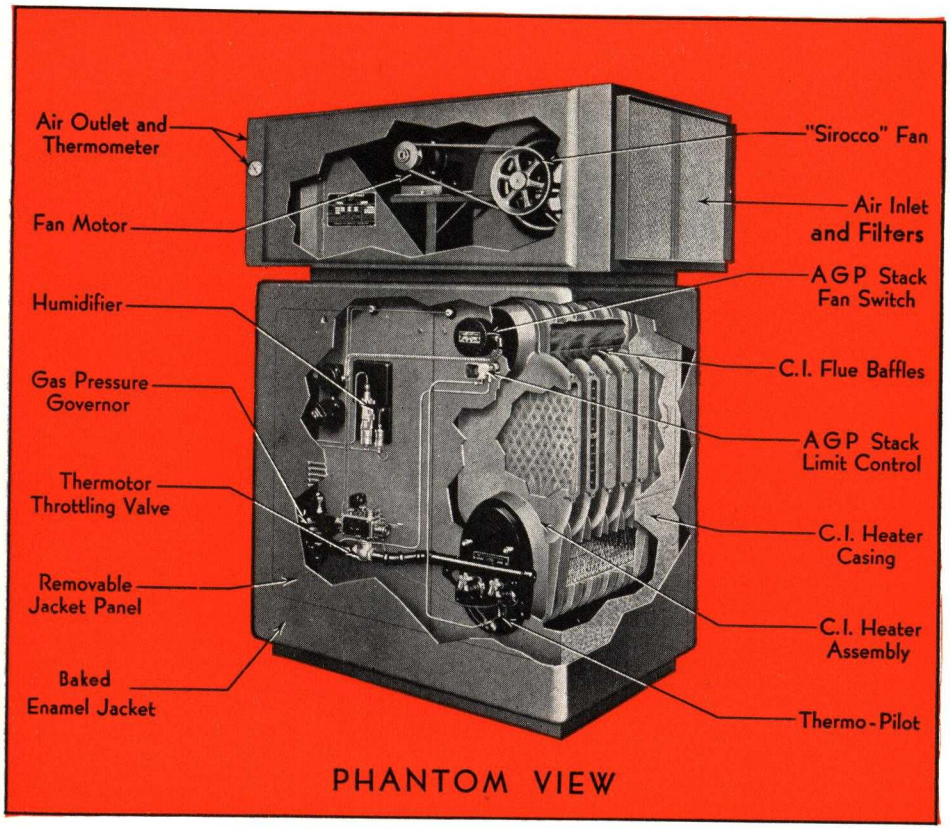
I - SELECTION FACTORS - Capacity Ratings

Model Number	AGA Rating Input Btu/hr.	AGP Guaranteed Rating			Conditioned Space Cu. Ft.	Maximum Fan CFM at 65°F
		Input Btu/hr.	Output at Bonnet Btu/hr.	Output at Registers Btu/hr.		
2-FE-4-100	100,000	90,000	72,000	64,800	10,600	660
2-FE-4-80	100,000	100,000	80,000	72,000	14,700	920
2-FE-5-100	125,000	112,500	90,000	81,000	13,300	830
2-FE-5-80	125,000	125,000	100,000	90,000	18,400	1150
2-FE-6-100	150,000	135,000	108,000	97,200	15,800	990
2-FE-6-80	150,000	150,000	120,000	108,000	22,000	1375
2-FE-8-100	200,000	180,000	144,000	129,600	21,100	1320
2-FE-8-80	200,000	200,000	160,000	144,000	29,400	1840
2-FE-10-100	250,000	225,000	180,000	162,000	26,600	1660
2-FE-10-80	250,000	250,000	200,000	180,000	36,600	2290
2-FE-12-100	300,000	270,000	216,000	194,400	31,700	1980
2-FE-12-80	300,000	300,000	240,000	216,000	44,000	2750

AMERICAN GAS PRODUCTS CORPORATION 40 WEST 40TH STREET
DIVISION OF AMERICAN RADIATOR & STANDARD SANITARY CORPORATION NEW YORK, N.Y.

AGP Gas-Fired Air Conditioners

By—



PHANTOM VIEW

SELECTION

Total heat loss should be calculated in the usual manner, and expressed in Btu per hour (follow standard methods). This calculation, together with a calculation of the cubic content of the space to be conditioned will permit selection of the proper size AGP air conditioner from the data given in Table 1. Heat loss should not exceed AGP guaranteed rating for output at registers, and cubic content should not exceed rating for maximum conditioned space.

Two sizes of fan motor unit are available for each of 6 sizes of heating units. In each of these, the smaller fan provides adequate air delivery (4 changes per hour) in relation to heat loss for the average uninsulated house; the larger provides adequate air delivery for an insulated house, in which the heat loss is identical but the cubic content is greater.

Overall clearance dimensions and sizes of all connections are given in Table II.

Duct Design. The conditioner is ordinarily assembled with intake of return air on right hand side and discharge outlet of warm air on left hand side. This assembly is reversible. In addition, the entire fan motor unit is reversible, front to back.

Kitchens, bathrooms and garages should never be provided with return air connections, as the air which is supplied to them should not be recirculated. If exhaust fans are used in any of these spaces, the amount of air exhausted should be allowed for in estimating heat loss, selecting the conditioner and designing the supply duct. The use of stud or joist spaces for return air ducts is not considered good practice in a trunk duct system.

All duct work should be not less than 26 gauge galvanized iron or steel with double locked seams and jointed with standard "S" drive clips.

Branch ducts or risers should have a cross-sectional area not less than 18 square inches, with no dimension smaller than 3". Maximum ratio of width to depth should be not more than 3 to 1 for trunks or basement branches, and 4 to 1 for risers.

All branch take-offs should be full-size, on a radius 1½ times the width of the branch, with minimum inside radius in main and trunk lines not less than ¾ the width of the duct.

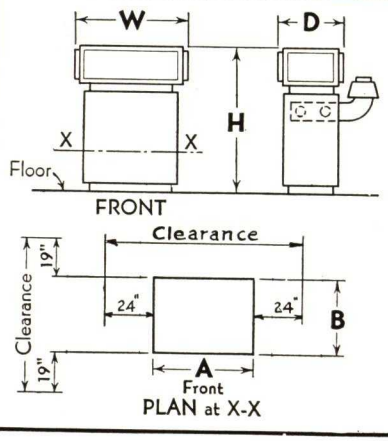
All risers and fittings should be supported from studs or joists with heavy galvanized band iron.

Volume dampers should be installed in all main ducts, and in all branch ducts near their connection with main duct. Dampers should be of locking type with indicator.

INSTALLATION

The conditioner should be located not less than 19" from front and rear walls so that all controls are accessible, and not less than 24" from side walls so that heating surfaces are readily accessible for cleaning. Installation should conform to good practice recommendations listed on page 3. See pages 8 and 9 for other conditioners.

II - CLEARANCES, DIMENSIONS and SPECIFICATIONS

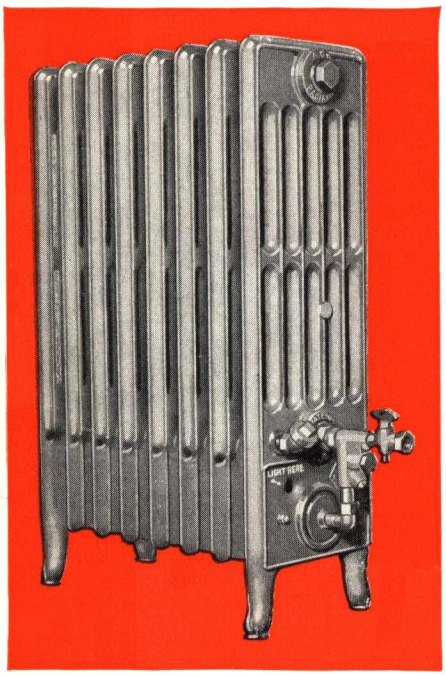


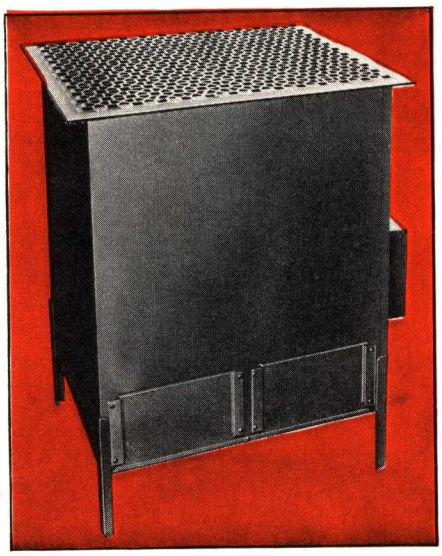
Model Number	Fan Motor Unit No.	Fan Motor H. P.	Size of Gas Cont. Valve (inches)	Number and Diameter of Flue Connections	Intake and Discharge Duct Conn. (in.)	Dimensions in Inches W	H	D	A	B	Approx. Shipping Weight (lb.)
2-FE-4-100	109-A	1/6	1	5	14½ x 24	56½	72½	29	50	29	1210
2-FE-4-80	109-B	¼	1	5	14½ x 24	56½	72½	29	50	29	1210
2-FE-5-100	109-B	¼	1	6	14½ x 24	56½	72½	29	50	32	1290
2-FE-5-80	112-A	¼	1	6	18½ x 28½	60	76½	34	50	32	1355
2-FE-6-100	109-B	¼	1	6	14½ x 24	56½	72½	29	50	35	1355
2-FE-6-80	112-A	¼	1	6	18½ x 28½	60	76½	34	50	35	1420
2-FE-8-100	112-B	¼	1¼	7	18½ x 38	60	76½	44	50	50	1760
2-FE-8-80	112-C	⅓	1¼	7	18½ x 38	60	76½	44	50	50	1755
2-FE-10-100	209-A	⅓	1¼	8	14½ x 58½	60	77½	64	50	62	2275
2-FE-10-80	212-A	½	1¼	8	18½ x 58½	60	81½	64	50	62	2315
2-FE-12-100	209-B	½	1¼	8	14½ x 58½	60	77½	64	50	62	2450
2-FE-12-80	212-B	¾	1¼	8	18½ x 58½	60	81½	64	50	62	2500

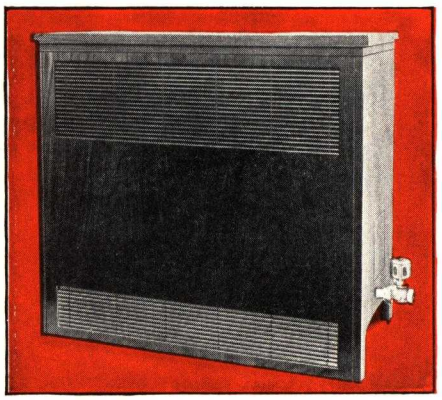
40 WEST 40TH STREET
NEW YORK, N.Y.
AMERICAN GAS PRODUCTS CORPORATION
DIVISION OF AMERICAN RADIATOR & STANDARD SANITARY CORPORATION

AGP Radiators, Floor Furnaces, Space Heaters and Conditioners

By—







Two compact AGP gas-fired space heaters are illustrated: the Floor Furnace (directly above), and the Unit-or (above right)

AGP Unit-or Capacities & Dimensions

UNIT-OR Number	INPUT Btu per hr.	RATING Equiv. Sq. Ft. Steam		DIMENSIONS (ins.)	
		without flue	with flue	Height	Floor Area
1	16,800	70	56	28½	12¾ x 31
2	21,600	90	72	32½	12¾ x 31
3	26,400	110	88	38½	12¾ x 31

AGP GAS FIRED RADIATORS
(Vented and Unvented)

Unvented

No. of Sections		Column	Height in Inches	Rating Sq. Ft.	Length Over All
26"	4	6	26	34	15½"
	5	6	26	41	18
	6	6	26	48	20½
	7	6	26	55	23
	8	6	26	62	25½
	9	6	26	68	28
	10	6	26	75	30½
	12	6	26	88	35½
	15	6	26	108	43
	18	6	26	129	50½
32" High	4	6	32	42	15½
	5	6	32	51	18
	6	6	32	60	20½
	7	6	32	70	23
	8	6	32	79	25½
	9	6	32	88	28
	10	6	32	97	30½
	12	6	32	116	35½
	15	6	32	143	43
	18	6	32	168	50½
38"	4	5	38	41	15½
	6	5	38	60	20½
	8	5	38	78	25½
	10	5	38	97	30½
	12	5	38	116	35½
	15	5	38	144	43

Radiators—5 col.—8" in width—6 col. 9¾" in width.

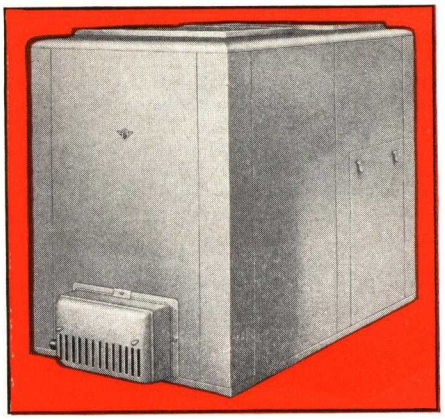
Vented
26 in. and 38 in. High—5 Columns

No. of Sections	Rating Sq. Ft.		Length Inches Both 26" and 38"
	26" High	38" High	
4	12	22	15
5	15	27½	17½
6	18	33	20
8	24	44	25
10	30	55	30
12	36	66	35
15	45	82½	42½
18	54	99	45
20	60	110	50
22	66	121	55
25	75	137	62½

AGP FLOOR FURNACE Capacities and Dimensions

FLOOR FURNACE Number		INPUT Btu per hr.	OUTPUT Btu per hr.	Approx. Capacity of Space Heated (Cu. Ft.)		DIMENSIONS (inches)	
Cast Grille	Steel Grille			0°	35°	Depth (below floor)	Floor Opening
21 CG	21 SG	20,000	14,000	3,000	6,000	38	14½ x 22½
31 CG	31 SG	35,000	24,500	4,500	9,000	38	18⅜ x 26⅜
41 CG	41 SG	50,000	35,000	6,000	12,000	38	22⅜ x 28⅜
51 CG	51 SG	75,000	52,500	9,000	18,000	40	26½ x 32½

AGP Gas Fired Air Conditioners



The AGP Air Conditioner, Type K is illustrated at the right. Designed as a companion to the Type 2-FE Conditioner suitable for use in the small residence, the Type K Conditioner supplies filtered, heated and humidified air by forced circulation through a system of delivery and return ducts. It is encased in a gun-metal enamel jacket.

The AGP Gas-Fired Air Conditioner, Type K is a forced warm air furnace designed for use in the modest dwelling. It contains a heating unit of heavy Armco copper bearing steel which is acetylene welded gas-tight, and may be automatically controlled by room-thermostat.

The Type K Conditioner is equipped with a glass wool type filter which is readily removable for inexpensive replacement. Humidification may be supplied automatically with a Thermo-Drip Humidifier, which is furnished as optional equipment.

The complete assembly is encased in a metal jacket finished in baked-on smooth gun-metal enamel.

Capacity ratings and dimensions are listed in the accompanying table. Selection should be based on output ratings in accordance with procedure outlined on Page 7. Installation should conform to standards of good practice described on Page 3. Design and installation of duct-work should conform to practices outlined on Page 7.

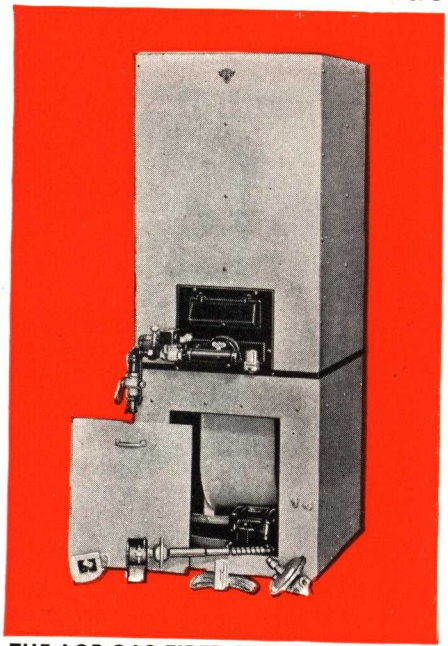
AGP Conditioner - Type K

UNIT Number	BTU per hour		DIMENSIONS (ins.)		
	Input Capacity	Register Output	H	W	D
9KS	90,000	60,750	53	27	47
12KS	120,000	81,000	57	32	57½
16KS	160,000	108,000	57	42	69
20KS	200,000	135,000	61	47	79
26KS	260,000	175,500	65	54	86½

AMERICAN GAS PRODUCTS CORPORATION 40 WEST 40TH STREET
DIVISION OF AMERICAN RADIATOR & STANDARD SANITARY CORPORATION NEW YORK, N.Y.

AGP Warm Air Furnaces and Gas Converters

By—



THE AGP GAS-FIRED JUNIOR FORCED AIR FURNACE, illustrated above, is designed for use in small dwellings, and may be installed in a closet, alcove or kitchen corner. It contains a heating element and radiation section of steel, air filters and blower, encased in an insulated steel jacket finished in baked-on smooth gray enamel. Capacity ratings and dimensions are listed in the table at right.

GRAVITY WARM AIR FURNACE

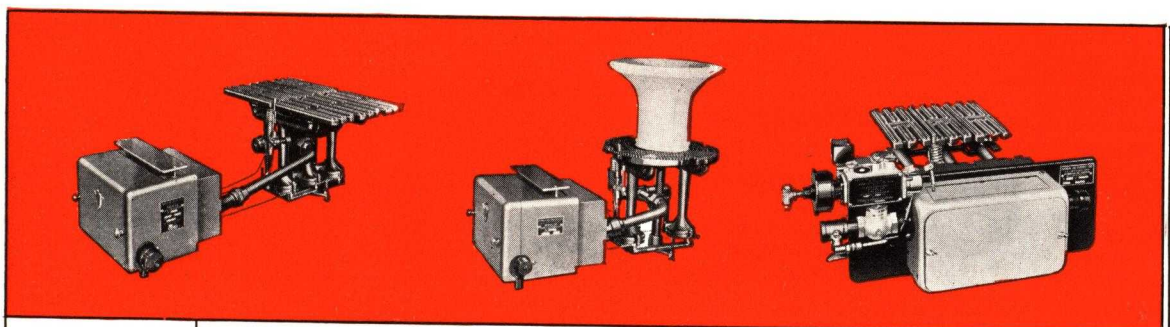
ITEM		Furnace Number				
		SG32-12CS	SG36-14CS	SG42-18CS	SG50-21CS	SG56-24CS
Capacity in 000's Btu/hr.	Input (AGA)	90	120	160	200	260
	Output	67.5	90	120	150	195
Dimensions (inches)	Width	27	32	41½	46½	53½
	Length	27	32	41½	46½	53½
	Height (overall)	58¾	62½	62½	66½	70½
	Canopy op'g. (square)	14¾	19¾	29¼	34¼	41¼

Junior FORCED AIR FURNACE

ITEM		Model Number		
		27-12	36-14	42-18
Capacity Btu/hr.	Input	90,000	120,000	160,000
	Register Output	60,750	81,000	108,000
Overall Dimensions (inches)	Depth	39¼	50¾	60¼
	Width	27	32	41½
	Height	75	79	81½

THE AGP GAS-FIRED STEEL GRAVITY FURNACE, provides semi-automatic warm air heating by gravity circulation which may be made completely automatic by the addition of a room thermostat. It contains a steel heating element enclosed in a galvanized or gun-metal enamel finish casing; optional equipment includes either manual or automatic type humidifier.

Selection should be based on capacity ratings as listed in the accompanying table, in accordance with procedure outlined on Page 3.



ITEM		AGP RECTANGULAR Convertor Number (S - Steam, W - Water, or F - Furnace)																			
		152	153	154	155	182	183	184	185	186	187	243	244	245	246	247	303	304	305	306	307
Maximum Input in Thousand Btu per hour		140	210	280	350	160	240	320	400	480	560	330	440	550	660	770	375	500	625	750	875
Minimum Dimensions Combustion Chamber (in inches)	W	15½	15½	15½	15½	18½	18½	18½	18½	18½	18½	24½	24½	24½	24½	24½	30½	30½	30½	30½	30½
	L	15¼	20	24¾	29½	16¼	21	25¾	30½	35¼	40	23	27¾	32½	37¼	42	25	29¾	34½	39¼	44

AGP RED FLASH Convertor Number (S or W)	Maximum Input Btu/hr. (in 000's)	Sq. Ft. Direct Radiation Installed	
		S	W
I-R-5	116.8	235	375
I-R-6	134.4	270	430
I-R-7	160.0	320	510
I-R-8	177.6	355	570
I-R-9	203.2	405	650
I-R-10	220.8	440	710
I-R-11	246.4	495	790

AGP ROUND Convertor Number (S, W, or F)	Maximum Input Btu/hr. (in 000's)	Diameter Burner (inches)
13-A	150	13
15-A	180	15
19-A	240	19
23-A	360	23

AGP GAS CONVERTORS for converting coal or oil-fired steam, hot water, or warm air systems to gas-fired systems controlled by room thermostat, are of three types:

AGP Rectangular Convertor for any rectangular boiler or furnace. Careful choice should be made to obtain the required input and proper burner area, suited to the individual fire box cross section.

AGP Round Gas Convertor for any round boiler or furnace, and especially designed for Arco round boilers, provides increased boiler efficiency.

AGP Redflash Convertor, for Ideal No. 1 Redflash boilers. Convertor numbers correspond to numbers of Ideal boilers for which they are designed.

Equipment includes complete burner assembly, adjustable gas orifices and air control embodied in attractive chamber which has a minimum extension into basement space.

Control equipment consists of: Thermotor gas valve with vapor tension thermostatic pilot providing complete control by room thermostat of any selection, and mechanical throttling and limit control as described under Ideal Boilers, Page 4.

Selection should be based on the following formulae and input ratings given in the accompanying tables (check adequacy of existing installation).

Warm Air Installation — Btu input = heat loss of building (Btu/hr.) x 1.56.

Steam and Hot Water Installations — Btu input = heat loss of building (Btu/hr.) x F (see following table).

Sq. Ft. Steam Rad. Reqd.	Sq. Ft. H.W. Rad. Reqd.	Factor "F"
200	350	2.11
250	400	2.09
300	470	2.04
400	640	2.00
500	800	1.95
600	1000	1.90
700	1100	1.83

AGP Gas-Fired Hot Water Heaters

By AGP

DESCRIPTION

Three types of AGP automatic gas-fired storage water heaters are available in a wide range of sizes for domestic and small commercial use: AGP Regular, the Dictator, and AGP Clipper; varying only in mechanical principle of flue design, all three types are manufactured in approximately similar capacities, and will yield equal efficiencies. Choice among the three types will be governed by preference for type of flue or finish color of exterior jacket.

AGP Regular is made in five sizes ranging from 20 to 75 gallons, with tank of galvanized steel or copper strengthened to withstand hydrostatic pressure of 300 pounds, and steel jacket finished in ivory and black crystalline enamel.

The Dictator is made in 4 sizes ranging from 15 to 40 gallons, with steel or strengthened copper tank, and steel jacket finished in baked-enamel in green or gray tones to match the Empire Boiler.

AGP Clipper is made in five sizes ranging from 15 to 40 gallons, with copper-bearing galvanized steel tank only, and steel jacket finished in light green baked-enamel with darker green trim.

FLUE DESIGN

AGP Regular has kidney shaped multiple flues, designed to provide ample heating surface coincident with efficient flue area. Flues form a central water column surrounded by hot flue gases, causing water to heat rapidly and recirculate through tank until adequate uniform temperature is reached. The Dictator has a single flue of large diameter with spiral baffle permitting full utilization of heating surfaces together with proper evacuation of the products of combustion. AGP Clipper has a circumferential flue surrounding tank, which utilizes all the products of combustion on the entire heating surface.

CONTROLS AND EQUIPMENT

All heaters are uniformly equipped with:

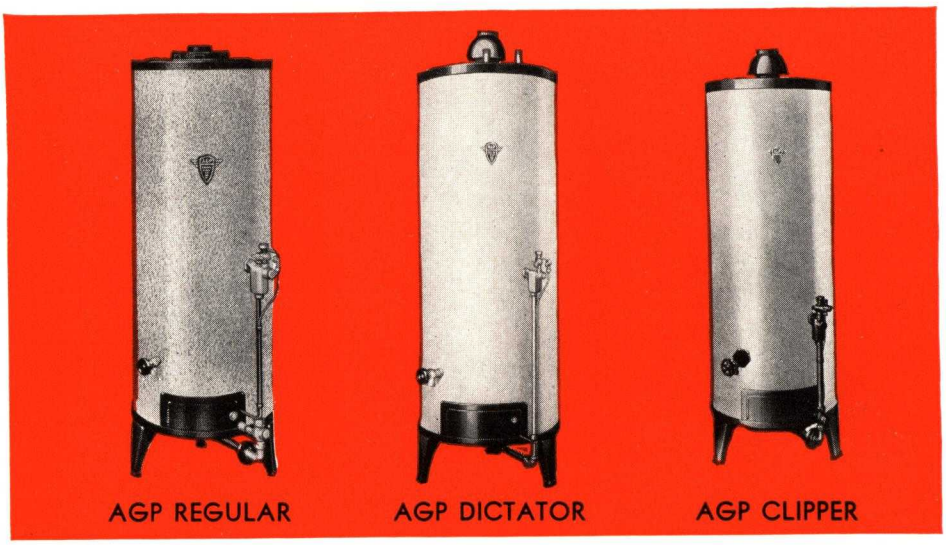
(1) a heavy blanket of rock wool *insulation,* extra thick on top surface;

(2) cold water, *Copper Intake Tube* so located that cold water injection will properly affect water temperature control element;

(3) a snap-action valve type thermostatic *water temperature control.*

Additional uniform equipment includes *draft diverter,* adequate *clean-out plugs, drain cocks* and *floor shield.*

Burner and thermostatic pilot equipment varies with type of heater. AGP Regular and Clipper have a C.I. blue-flame drill port burner and a multiport blue flame thermostatic pilot utilizing a bi-metallic element. The Dictator has a patented jet type burner, with individual brass jets, and heat-resisting alloy bell baffle. Thermostatic pilot is built within main burner, and utilizes a bi-metallic element.



Exterior appearance of AGP Gas-fired storage type water heaters is illustrated above. Reading from left to right: AGP Regular, The Dictator, and AGP Clipper. The accompanying diagram shows a standard installation with hot and cold water connections, flue connection, and gas connection indicated

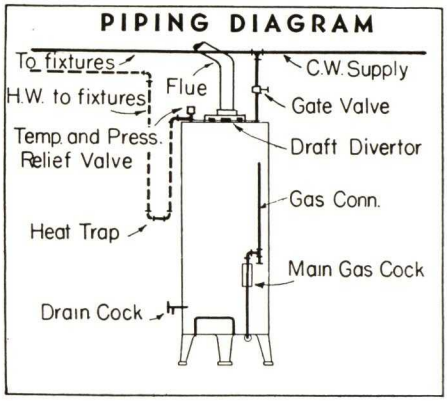
SELECTION

AGP storage water heaters may be used in conjunction with AGP boilers and air conditioners to furnish completely automatic hot water supply, or in conjunction with any heating system where domestic hot water supply is not integral.

Selection of the proper capacity heater should be based on data given in Table 2. Required capacity should be calculated in accordance with standard methods.

INSTALLATION

Installation of AGP automatic storage water heaters should conform to standards of good practice outlined on Page 3.



I - RECOMMENDED USES

Legend: R-Living or Bedroom; K-Kitchen; B-Bathroom; L-Laundry Room; P-Pantry; W-Washstand; C-Barber Chair

Type of Installation	Capacities in Gallons					
	15	20	25	30	40	75
Residences	1-3R K,B,L	3-5R K,B,L	4-7R K,B,L	5-7R K,2B,L	6-9R, K,2B 5-7R, K,3B,L	8-11R, 3-4B, K,P,L
Multi-Family Dwellings						Small 2-Family Apartment
Offices (General) (Business)	✓	✓	✓	✓	✓	✓
Soda Fountains	✓	✓	✓	✓	✓	✓
Beauty Parlors	1W	2-3W	3-5W	5-7W	7-9W	10-15W
Barber Shops	1-2C	3-5C	5-7C	7-8C	8-10C	10-20C
Offices (Doctors) (Dentists)		✓				
Restaurants						✓

AMERICAN GAS PRODUCTS CORPORATION 40 WEST 40TH STREET
DIVISION OF AMERICAN RADIATOR & STANDARD SANITARY CORPORATION NEW YORK, N.Y.

AGP Gas-Fired Hot Water Heaters

By—

II - CAPACITIES and DIMENSIONS

In the accompanying diagrams all dimensions are given in inches

H = overall height

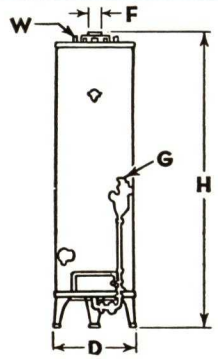
D = overall diameter

F = diameter of flue connection

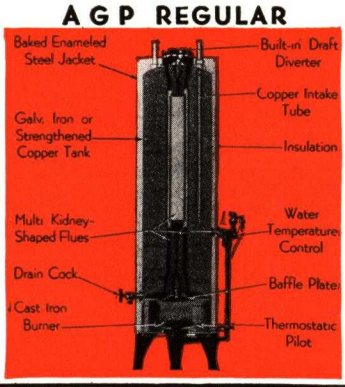
G = size of female gas connection

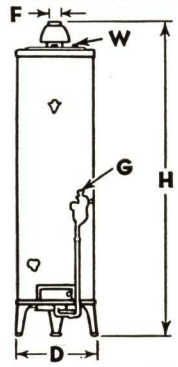
W = size of water pipe connection

Recovery gallons per hour represent U. S. Gallons raised 60°F. Recovery capacity Imperial Gallons equals Recovery capacity U. S. Gallon ÷ 1.2

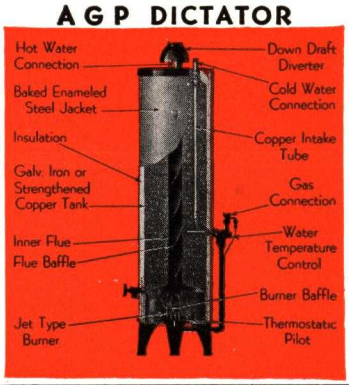


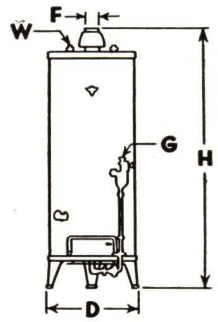
AGP REGULAR



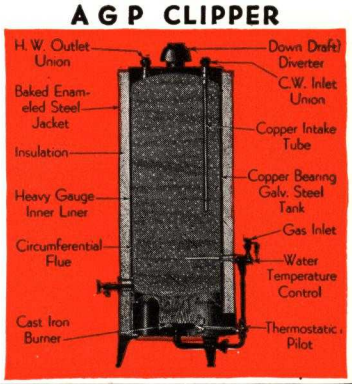


AGP DICTATOR





AGP CLIPPER



ITEM															
Unit Numbers	Steel Tank	20-S	25-S	30-S	40-S	75-S	152-S	202-S	302-S	402-S	153-S	203-S	253-S	303-S	403-S
	Strengthened Copper Tank	20-C	25-C	30-C	40-C	75-C	—	202-C	302-C	402-C	—	—	—	—	—
Capacity in Gallons		20	25	30	40	75	15	20	30	40	15	20	25	30	40
Dimensions in Inches	H Overall Height	57⅛	65⅛	54	66	66⅜	50	60	56¾	68¾	49½	49⅝	56¾	63⅞	64¼
	D Diameter	15¾	15¾	19	19	25½	15¾	15¾	19	19	18⅜	20⅝	20⅝	20⅝	22½
	F Flue Diameter	3	3	3	3	4	3	3	3	3	3	3	3	3	3
	G Size of female gas conn.	½	½	½	½	⅜	½	½	½	½	½	½	½	½	½
	W Size of water pipe conn.	¾	¾	¾	¾	1¼	¾	¾	¾	¾	¾	¾	¾	¾	¾
Btu Input		20,000	22,500	25,000	30,000	60,000	17,500	20,000	25,000	28,000	20,000	20,000	30,000	30,000	30,000
Recov. Gals. per hour (60° rise)		28.0	31.5	35.0	42.0	83.9	24.5	28.0	35.0	39.2	28.0	28.0	42.0	42.0	42.0
Gas Consumption Cu. Ft. per hour	500 Btu	40.0	45.0	50.0	60.0	120.0	35.0	40.0	50.0	56.0	40.0	40.0	60.0	60.0	60.0
	550 Btu	36.4	40.9	45.5	54.5	109.0	31.8	36.4	45.5	51.0	36.4	36.4	54.5	54.5	54.5
	800 Btu	25.0	28.1	31.3	37.5	75.0	22.0	25.0	31.3	35.0	25.0	25.0	37.5	37.5	37.5
	1000 Btu	20.0	22.5	25.0	30.0	60.0	17.5	20.0	25.0	28.0	20.0	20.0	30.0	30.0	30.0
	1150 Btu	17.4	19.6	21.7	26.1	52.2	15.2	17.4	21.7	24.3	17.4	17.4	26.1	26.1	26.1
Approx. Shipping Weight	Steel	252	275	310	362	635	206	231	282	325	218	246	270	298	350
	Copper	227	255	299	346	617	—	194	248	291	—	—	—	—	—

40 WEST 40TH STREET NEW YORK, N.Y.
AMERICAN GAS PRODUCTS CORPORATION
DIVISION OF AMERICAN RADIATOR & STANDARD SANITARY CORPORATION

LOCATION OF SALES OFFICES

Ask for American Gas Products Corporation Representative

ATLANTA, GA.—G. J. Kollock
Norris Building

BALTIMORE, MD.—See Washington, D. C.

BOSTON, MASS.—American Gas Products Corporation
250 Stuart Street

BROOKLYN, N. Y.—J. A. McIntosh
1415 East 35th Street
C. E. Tice
1771 East 16th Street

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1807 Elmwood Avenue

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CHICAGO, ILL.—American Gas Products Corporation
122 South Michigan Avenue

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DENVER, COLO.—American Gas Products Corporation
810—14th Street

DETROIT, MICH.—American Gas Products Corporation
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KANSAS CITY, MO.—C. W. Hazelton
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30 Normal Avenue

NEW YORK, N. Y.—American Gas Products Corporation
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PHILADELPHIA, PA.—Sidney Loog
1050 North Delaware Avenue
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PITTSBURGH, PA.—American Gas Products Corporation
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ST. LOUIS, MO.—American Appliance Co.
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Taylor Arcade

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AMERICAN GAS PRODUCTS CORPORATION
DIVISION OF AMERICAN RADIATOR & STANDARD SANITARY CORPORATION
40 WEST 40TH STREET · NEW YORK, N.Y.

FLUID HEAT DIVISION

ANCHOR POST FENCE COMPANY

Manufacturers of Oil Burners and Air Conditioners

BALTIMORE, MD.

For Anchor Post Fencing, see File Index

fluid heat
OIL BURNER

"Wall-Flame" Rotary

Products

Pressure Atomizing Oil Burners, and Rotary "Wall-Flame" Oil Burners for conversion purposes; Oil-fired Winter-Conditioning Furnaces; Complete Burner-Boiler Units; Automatic Oil-Burning Water Heaters.

"Wall-Flame" Rotary Burners—Made in 7 sizes for converting steam, hot water, and warm air heating plants to oil burning. Has micrometer air adjustments on discharge side of the fan. Flame is applied directly against boiler wall.

Pressure Atomizing (Gun Type) Oil Burners—Made in 5 models with capacities from $\frac{7}{10}$ to 12 gal. of oil per hour.

All Fluid Heat Burners are adaptable for conversion in existing plants.

Pressure (Gun) Type

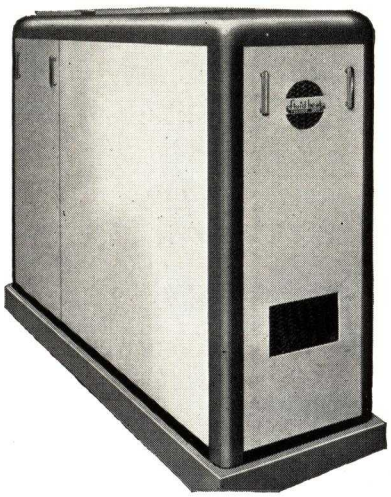
FLUID HEAT WINTER-CONDITIONING FURNACE

The Fluid Heat Winter-Conditioning Furnace is a practical, efficient and automatic residential heating plant which employs forced air circulation. It is designed to supply uniform heat, using filtered, properly moistened air.

Heating Economy

A system of expanded metal baffles in a heat exchanger chamber controls rate of travel of hot gases, delivering maximum heat to enveloping air. They then are carried through the humidifier where extra heat is supplied to guarantee sufficient moisture, and finally pass over the incoming air, serving to pre-heat this before it enters heating chamber.

An ingenious blower mechanism assures proper circulation of air over all the heated surfaces. Incoming air is made dust-free by the use of viscous type filters.



Improved Pressure Burner

This unit employs the most advanced burner of the pressure type. It regulates air for combustion at the discharge instead of the intake, guaranteeing an unvarying supply. A sharp rotating motion is imparted by the "spiraflo" thus assuring complete mixing of fuel oil with the air and a quiet flame.

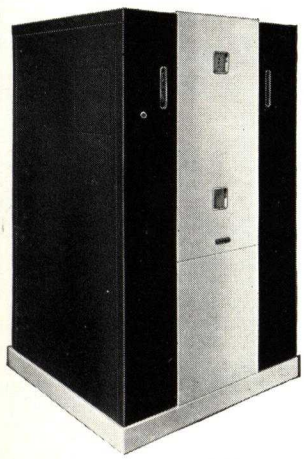
Unit and Cabinet

Entire surface of the steel exchanger is effective heating area and is gastight. The unvarying temperature throughout the exchanger results in uniform heat and long furnace life.

The entire unit is encased in a neat cabinet with no projecting surfaces and is wholly rigid.

FLUID HEAT BURNER-BOILER UNITS

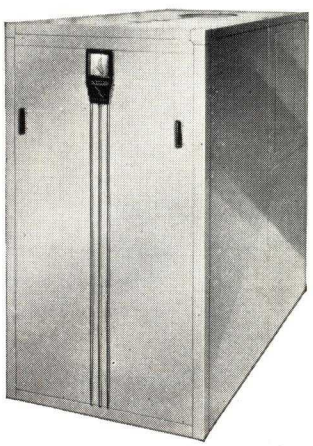
All approved construction developments are present in the Fluid Heat Burner-Boiler Units.



Series "R" and "P"

With a Fluid Heat Burner-Boiler Unit there is no need for a separate heater for domestic hot water or a separate fuel supply. An indirect coil to provide hot water is an integral part of the Unit. It has a 40-gal. capacity, (100-gal. capacity obtainable at slight extra cost). In addition, these units provide the following outstanding features:

(1) Built-in indirect heater for domestic hot water supply. 40-gal. capacity. (2) Specially designed finned surfaces in the long flue passages split the hot gases into thin streams, absorbing the maximum amount of heat into the boiler water. (3) Fluid Heat Oil Burner, completely enclosed by boiler cabinet. (4) Steel cabinet in attractive colors. (5) Heavy, indestructible asbestocell insulation prevents heat loss and insures quiet operation. (6) Machine ground surfaces of doors and sections prevent short-circuiting of gases, infiltration of air, and escape of odors. (7) Scientifically designed combustion chamber insures clean firing. (8) Front panel removable to permit observation of fire through Pyrex sight glass. (9) Large clean-out door gives easy access to all flue surfaces. (10) Water column, combination pressure and vacuum gauge on steam boilers; and altitude gauge and thermometer on hot water boilers. (11) Especially large steam releasing area and steam dome insure dry steam at entrance to piping. (12) Circulator pump on hot water boiler; low water cutoff on steam boilers.



Series "A"

152TT

AMERICAN BLOWER CORPORATION

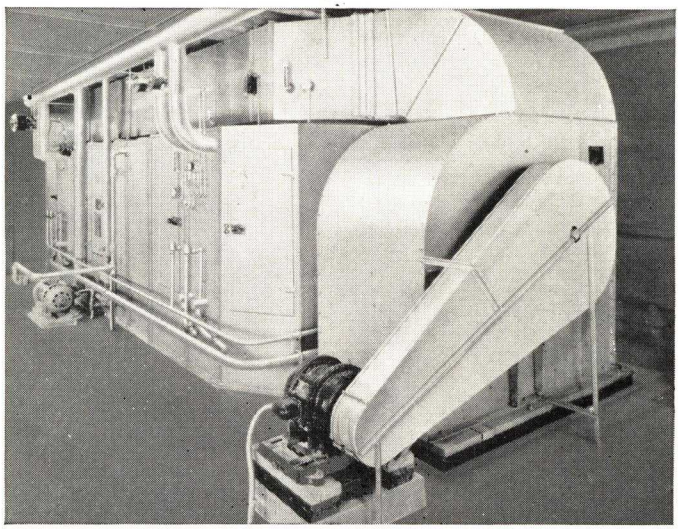
Division of American Radiator and Standard Sanitary Corporation

GENERAL OFFICES AND FACTORY

DETROIT, MICH.

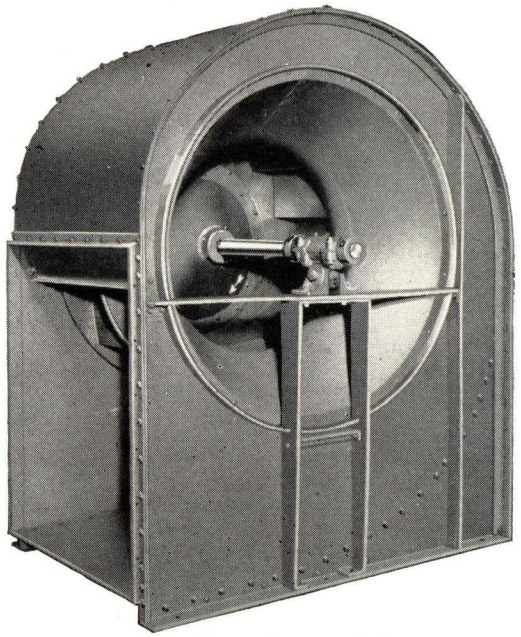
BRANCHES IN ALL PRINCIPAL CITIES

AIR CONDITIONING — HUMIDIFYING — DEHUMIDIFYING — COOLING — VENTILATING — HEATING — VAPOR-ABSORPTION — DRYING — AIR WASHING AND PURIFICATION



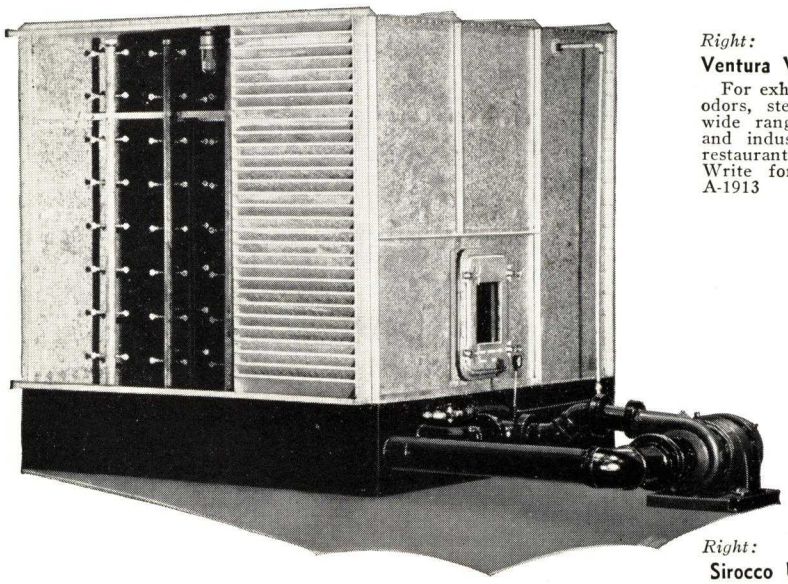
American Blower Central Air Conditioning Systems with Sirocco Fan

Standard for more than 30 years. Particularly adaptable for heating, ventilating, air washing, purifying and cooling large buildings. Write for complete data on central air conditioning systems



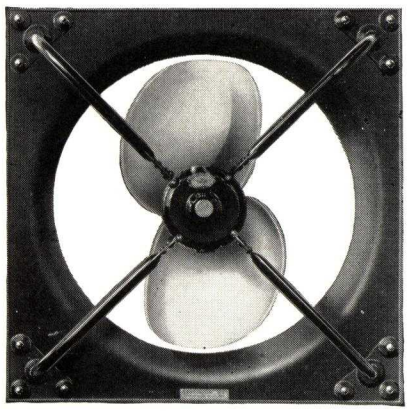
American Blower Multi-Blade Fan

For heating, ventilating, cooling and air conditioning system. High volumetric and mechanical efficiency. Driven by belt, steam engine, motor or turbine. Capacities 30,000 to 500,000 c.f.m. Write for Bulletin No. A-403



American Blower Dehumidifiers and Washers

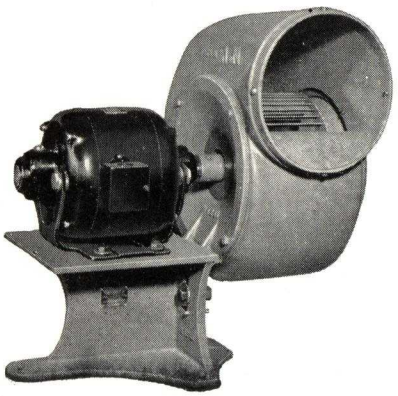
For dehumidifying, cooling and washing air in connection with central systems, for air conditioning, for process work or for use with a ventilating system where large quantities of fresh, washed air are required. Thousands of these dehumidifiers are already in operation in theaters, public buildings, office buildings, garages, hotels and industrial plants. Write for Special Bulletin No. 3523



Right:

Ventura Ventilating Fan

For exhausting bad air, odors, steam, etc., in a wide range of buildings and industrial processes, restaurants, garages, etc. Write for Bulletin No. A-1913



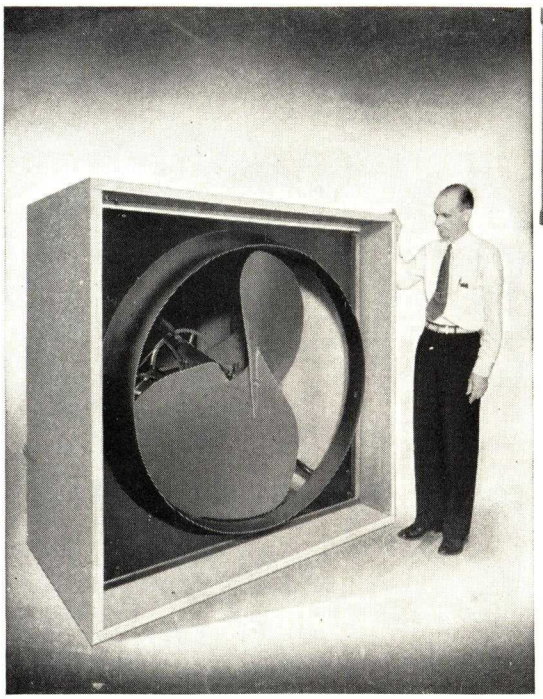
Right:

Sirocco Utility Blower

For use with a duct system in exhausting bad air, fumes, excessive heat and odors, or for furnishing fresh air. Variety of sizes for a wide range of application. Write for Bulletin No. A-18029

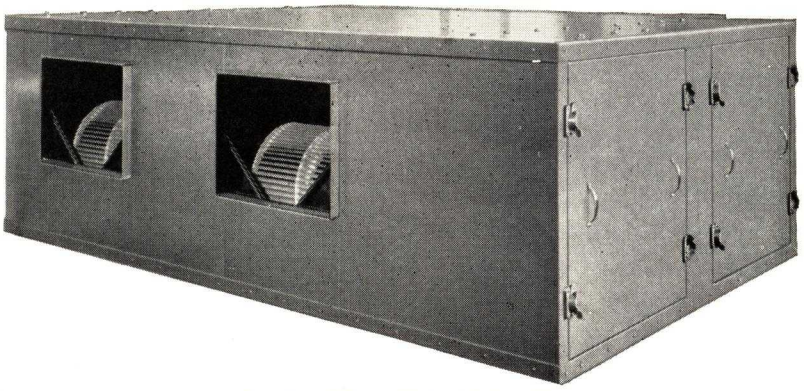
TYPES OF AMERICAN BLOWER CORPORATION AIR HANDLING AND CONDITIONING EQUIPMENT

All types of air handling and air conditioning equipment for industrial applications, process work, drying, cooling; also equipment for stores, offices, shops, public buildings, power plants, etc., and attic ventilation for homes.



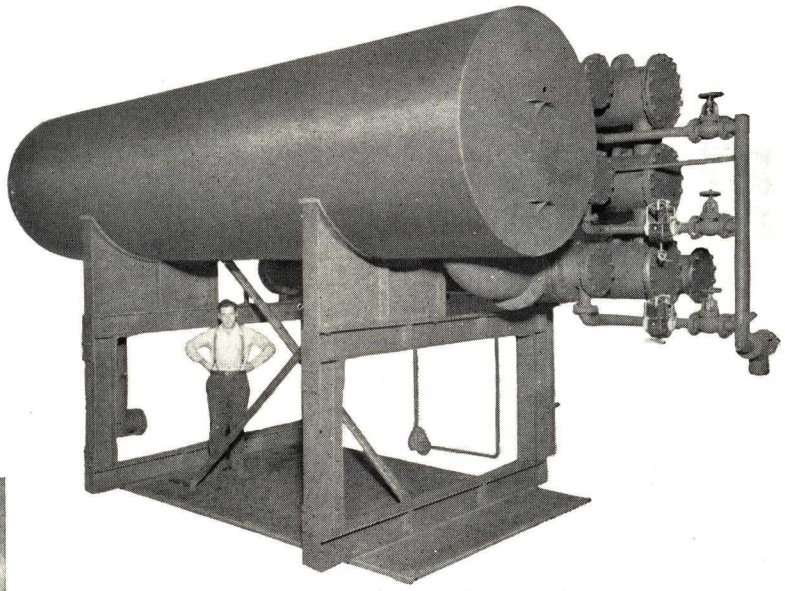
Ventura Home Conditioner

For comfort cooling by means of attic ventilation. Made in various sizes for all home needs. No refrigerating machine required. Thousands already in operation. Write for Bulletin No. A-3713



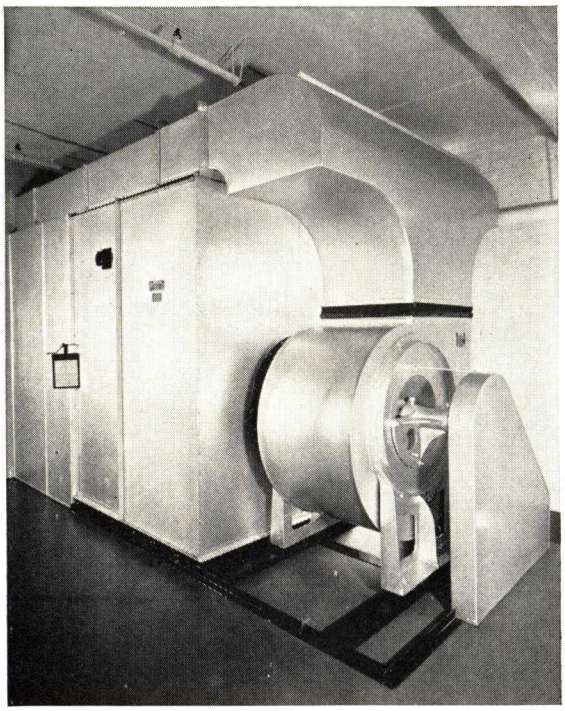
American Blower Series B Conditioner

For installation in stores, restaurants, offices and other commercial establishments. May be installed in present buildings or new buildings for cooling, ventilating, dehumidifying as well as heating and humidification. Write for technical Bulletin No. 5127



Decalorator Steam Refrigeration Units

Furnished for air conditioning and process cooling. By means of a jet of steam and the flow of condensing water, they function to produce cool, refrigerated water at any temperature above 35° F. For complete data on steam refrigeration, send for Bulletin No. 3727



American Blower Series K Conditioner

For use with a duct system in a wide variety of air conditioning applications. For complete data on this conditioner write for Bulletin No. 3927

152T

Copper Fin Surface Coils

For cooling and blast heating. Write for Bulletin No. 32

NOTE: *For complete data on any air handling equipment of any type, telephone the nearest American Blower Branch Office, or write direct to the factory. No obligation.*

BUFFALO FORGE COMPANY

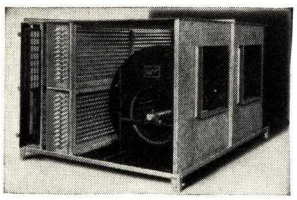
484 Broadway, BUFFALO, N. Y.

BRANCH OFFICES

ALBANY, N. Y., 611 Standard Bldg.
ATLANTA, GA., 724 First National Bank Bldg.
BALTIMORE, MD., 404 St. Paul St.
BOSTON, MASS., 486 Main St., Melrose Station
CHICAGO, ILL., 20 No Wacker Drive
CINCINNATI, OHIO, 622 Broadway
CLEVELAND, OHIO, 418 Rockefeller Bldg.
DALLAS, TEX., 315 So. Harwood St.
DAVENPORT, IOWA, 305 Security Bldg.
DENVER, COLO., Hendrie & Bolthoff Mfg. & Supply Co., 1635 Seventeenth St.
DES MOINES, IOWA, 214 Old Colony Bldg.
DETROIT, MICH., Coon DeVisser Co., 2051 W. Lafayette Blvd.
GREENVILLE, S. C., 201 Franklin National Life Bldg.
INDIANAPOLIS, IND., 310 Indiana Pythian Bldg.
KANSAS CITY, MO., 428 Dwight Bldg.
KITCHENER, ONT., CANADA, Canadian Blower & Forge Co., Ltd.
KNOXVILLE, TENN., C. F. Sexton, 702 Empire Bldg.
LOS ANGELES, CALIF., 708 Pershing Square Bldg.
MINNEAPOLIS, MINN., 619 Foshay Tower
NASHVILLE, TENN., Southern Sales Co., 117 Fifth Ave., No.
NEW ORLEANS, LA., Devlin Bros., 1003 Maritime Bldg.
NEW YORK, N. Y., 39 Cortlandt St.
PHILADELPHIA, PA., 220 So. Sixteenth St.
PITTSBURGH, PA., 431 Fulton Bldg.
SAN FRANCISCO, CALIF., Moore Machinery Co., 550 Fifth St.
ST. LOUIS, MO., 1598 Arcade Bldg.
SALT LAKE CITY, UTAH, Salt Lake Hardware Co.
SEATTLE, WASH., 500 First Ave., So.
TOLEDO, OHIO, 1922 Linwood Ave.
TUCSON, ARIZ., Tidmarsh Engineering Co.
WASHINGTON, D. C., 820 Woodward Bldg.
WILKES-BARRE, PA., Power Engineering Corp., 517 Brooks Bldg.

P. C. AIR CONDITIONING CABINETS, EVAPORATIVE CONDENSERS, LIMIT LOAD FANS AND AIR WASHERS

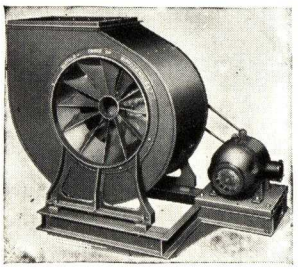
P. C. Air Conditioning Cabinets



Among the most popular units built for Air Conditioning, Buffalo P. C. Cabinets provide cleaning and cooling, cleaning, heating and cooling, or complete air conditioning, including humidifying and dehumidifying. They are made in a wide range of capacities, are extremely quiet in operation. Suitable for use with all types of commercial refrigerants, Buffalo P. C. Cabinets fit the needs of every comfort air conditioning job.

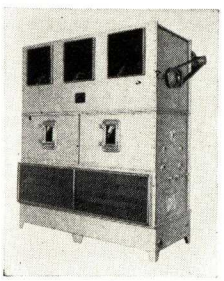
Coils are copper-fin tube; fans are famous Buffalo high efficiency multiblade type. Careful attention to design has provided units which are sturdy, practical, quiet and efficient. Bulletin 501 gives complete details.

Limit-Load Fans



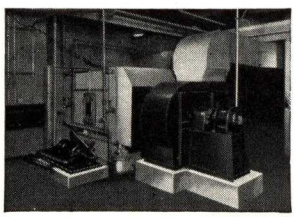
Buffalo Limit-Load Conoidal Ventilating Fans will solve your air handling problem efficiently and easily. These dynamically balanced fans are available mounted on a silent floating base. Fans are the non-overloading type and will give years of continuous trouble-free service. Another important feature of all Buffalo Limit-Load Fans is their quiet operation. All fans are accurately rated and guaranteed to deliver in accordance with their ratings. Available in a wide variety of sizes for every air handling problem. For complete details write for Bulletin 2955.

Evaporative Condensers



Buffalo Evaporative Condensers will save over 90% of the water used for direct cooling of condensers. The make-up water required will not exceed .03 g. p. m. per ton of refrigeration. The necessity for cooling towers is eliminated. All tanks are welded black steel. Casings of galvanized steel sheets and galvanized angles. All seams riveted and welded to make watertight construction. Eliminators of galvanized steel. Buffalo Close Coupled Pump operates Spray System. These Evaporative Condensers are designed for high efficiency with large coil service, low air velocities, and consequent low power consumption. Available in a wide variety of sizes, capacities 4½ tons up. Write for Bulletin 305A.

Air Washers

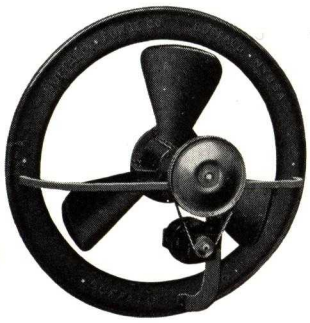


Buffalo Air Washers offer an economical and efficient method of air cleaning. They are easily installed and require a minimum of attention and service. Construction features include non-clogging operating nozzles, suction screen across full length of tank, maximum contact between air and water spray, demountable eliminators made in one piece. Made of copper or other materials to resist corrosion if necessary, Buffalo Air Washers are available in a wide range of sizes. Our Bulletin No. 480A gives complete details and all the necessary engineering data.

BREEZ-AIR ATTIC FANS, BREEZO KITCHEN FANS, BABY CONOIDAL FANS AND HVA FANS

Breez-Air Attic Fans for Comfort Cooling

These quiet, large capacity fans have won national recognition as an efficient and economical method of residential cooling during hot weather. Fans are put into operation after sundown and within a very few minutes the inside temperature of the home is brought down to within 3 or 4 degrees of the cool outside night air. Breez-Air Fans are available in the following sizes: 30, 36, 42, and 48 in. They are easily and quickly installed in either old or new homes.

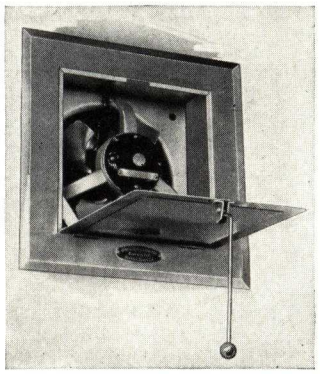


Buffalo Breez-Air Attic Fans are ruggedly constructed, with frame consisting of a steel ring to which is rigidly attached the fan and motor frame. Four bolt holes are provided to bolt the unit to the Penthouse or supporting frame. The fan wheel is the broad-blade type, thus assuring delivery of a larger volume of air and more quietly than can be done with the multi-blade type of fan. General Electric motors running at 1725 r.p.m. are standard equipment on these Attic Fans. The motors are mounted on resilient rubber supports and bolted to the steel frame.

For complete information, write for Bulletin 3085.

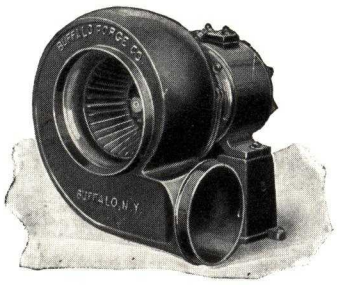
Breezo Kitchen Ventilating Fans

Buffalo 8-in Home Ventilating Units provide proper ventilation for bungalows, apartments, kitchenettes, and kitchens of all types of homes. Fans are sturdily built and unusually quiet in operation. Fan is complete with wall box ready for installation. When fan is not in use, the doors of the box may be easily closed. The Buffalo Home Ventilating Fan is also available in 12-in. size for larger homes. For complete information, write for Bulletin 2892-C.



Baby Conoidal Fans for Ventilating, Exhausting, Etc.

These high velocity fans have many uses in ventilating industrial plants, stores, schools, and public buildings. Industrial uses include exhausting from hoods and vats, where steam, smoke or foul air must be removed. In schools and public buildings, Baby Conoidal Fans are frequently used to ventilate washrooms, telephone booths, etc. Fans are available in 5 sizes. Write for Bulletins giving complete information.

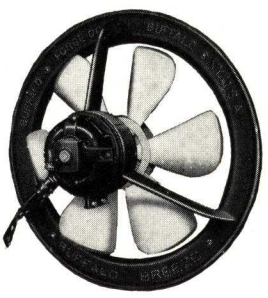


HVA Fans for Air Conditioning

Buffalo HVA Fans are of the multiblade type directing a large volume of air efficiently against the back pressure encountered in the usual air conditioning system. These fans operate quietly at the speeds for which they are intended. Bearings are floated on rubber insulation. Buffalo HVA Fans are available in a wide range of sizes and capacities. Complete engineering data and rating tables gladly furnished on request.

Breezo Fans for Industry

Buffalo Breezo Fans are solving ventilation problems for hundreds of industries quietly and economically. It is the special streamlined design, and construction of the pressed steel ring permits the air to enter the wheel without frictional loss or eddy currents. Bearings are of extra large dimensions. Capable of rendering many years of uninterrupted service. Motors are totally enclosed to keep out dirt and water.

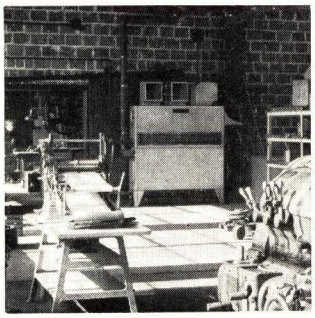


The air in your plant should be changed every five to ten minutes. The Buffalo Breezo Fan offers the efficient, economical solution to this problem.

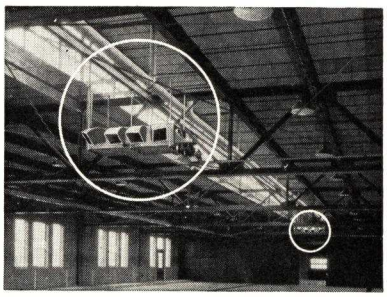
BUFFALO HIGHBOY, LOWBOY, BREEZO-FIN AND GAS UNIT HEATERS

Highboy and Lowboy Unit Heaters

Buffalo Highboy and Lowboy Unit Heaters were specially designed to distribute warm air over a large area quietly, efficiently, and at a low cost. The Highboy is compactly designed to take a minimum of floor space and the outlets so arranged to give maximum distribution of the heated air. High efficiencies are obtained because of the special design and centrifugal multi-rotors, the shape of the individual fan housings, the use of finned heating coils, and the properly proportioned outlets.

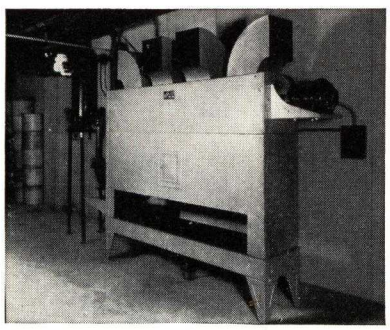


Where floor space is at a premium, Buffalo Lowboy Unit Heaters are recommended for suspension as they can be readily suspended from the ceiling in any part of the building requiring Unit Heaters.



Heaters are available with special Thermadjust dampers. With this special control, minimum outlet temperatures are used at all times, thus assuring maximum economy in operation.

Unit Coolers



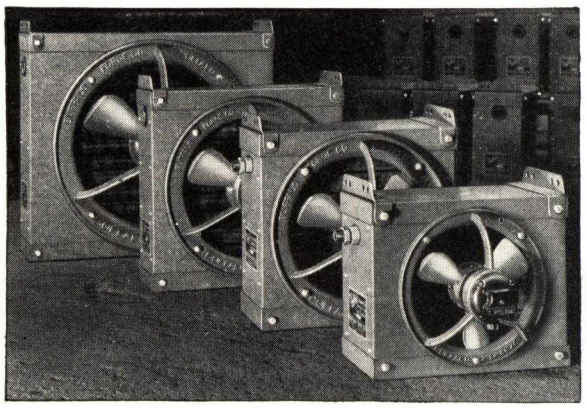
Buffalo Unit Coolers are available in the following types: 1. Floor Type, 2. Flat Suspended Type, 3. Type S C Suspended Type. We illustrate the Floor Type Unit.

Buffalo Floor and Flat Suspended Unit Coolers were designed primarily for industrial and cold storage work. Both steel and copper coils have extended surface but only three fins per inch so that they can spray successfully under frosted conditions. Copper coils are designed for freon and Methyl Chloride. Steel coils for ammonia, cold water, and brine. Fans have been designed for quiet and most efficient operation. Rotors are mounted on ball bearings.

For complete information on all types and sizes of Buffalo Unit Coolers write for Bulletin 3053.

Breezo-Fin Unit Heaters

Buffalo Breezo-Fin Unit Heaters may be used with either high or low steam pressures and may be mounted



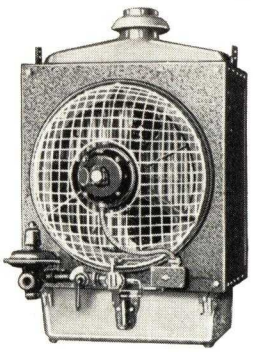
on either walls or ceilings. These compact heaters are equipped with large capacity fans which are exceedingly quiet in operation. Heating element is made of lightweight copper-fin coil. Non-corrosive. The discharge louvers are each separately adjusted to direct the air wherever desired.

Buffalo Breezo-Fin Unit Heaters are available in 5 sizes and may be easily and quickly installed wherever the advantages of Unit Heating are desired.

For complete information on all Buffalo Unit Heaters rating tables, and other valuable engineering data, write for Bulletin 3050.

Gas Unit Heaters

Buffalo Gas Unit Heaters burn natural or artificial gas. Automatic safety features and temperature control provide ample heating with economical gas consumption. The initial cost is low as these Gas Unit Heaters require no boiler room or fuel storage or other auxiliary equipment. Neither do they require engineers or firemen—simply push a button to start and stop the Heater. Gas shuts off automatically when fan stops. Turns on when fan is started. Fan shuts off if gas supply fails. Will not start again until pilot is lighted. Available in a wide variety of sizes and steams with B.t.u. capacities of from 75,000 to 500,000.



In addition to the Suspended type Gas Unit Heater illustrated, Buffalo Gas Unit Heaters are also available in the larger floor type designs. These are especially recommended for buildings with large floor areas and high ceilings. Buffalo Floor Type Units are only 18″ wide, thus fitting conveniently between building columns without taking up valuable floor space Designed for automatic temperature control from thermostat. The gas valve is tied in electrically so that gas shuts off when fan stops. Gas shuts off if pilot goes out and will not go on until pilot is again lighted.

The BURNHAM Complete Line

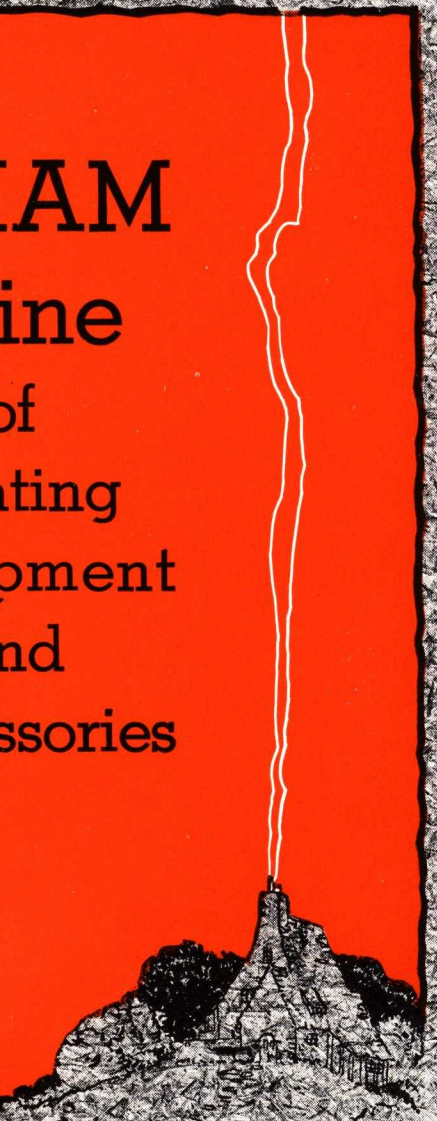
of

Heating

Equipment

and

Accessories



Burnham Boiler Corporation

IRVINGTON, NEW YORK

BURNHAM

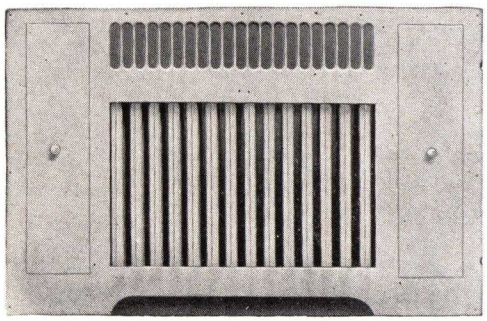
UNIT SYSTEM OF WINTER AIR CONDITIONING

EFFICIENT • FLEXIBLE • INEXPENSIVE

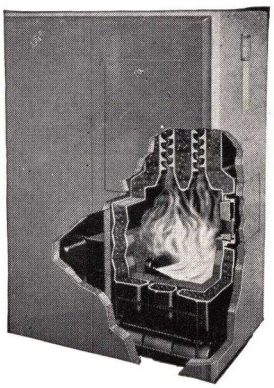
THE UNITS OF THE SYSTEM

Unit Air Conditioner

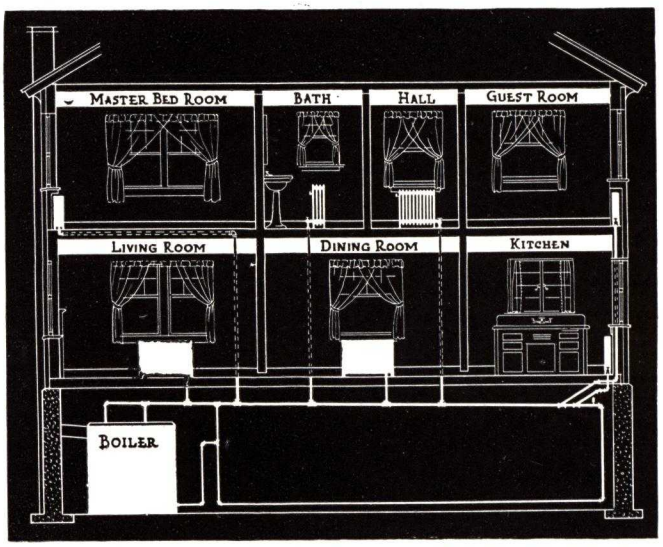
Slenderized Radiators



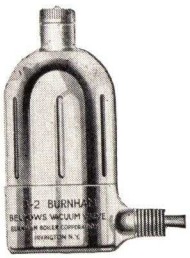
Panel Front Recess Type Slenderized Radiator



Burnham Built-In Oil Burning Boiler



Showing the Simplicity of the Burnham Unit-Air Conditioning System of Heating



Radiator and Vacuum Valves

What Constitutes a Burnham Unit System of Winter Air Conditioning

THE BOILER UNIT

- Coal Burning Hand or Stoker Fired
- Oil Burning
- Conversion—Oil or Coal
- Gas Burning

HOT WATER SUPPLY

- Biltin Taco Heater (Oil Boilers)
- Domestic Hot Water Supply Boiler
- Burnham-Taco Tank

HEAT DISTRIBUTING UNITS

- Air Conditioner, Filtering, Humidifying, Heating and Circulating Conditioned Air under Thermostatic Control
- Burnham Slenderized Radiators 40% Faster Heat—40% Less Space
- Burnham Enclosed Slenderized Radiators
- Burnham Electric Auxiliary Radiators
- Burnham Venting and Radiator Valves

Advantages of the Burnham Unit System

IN THE BUILDING

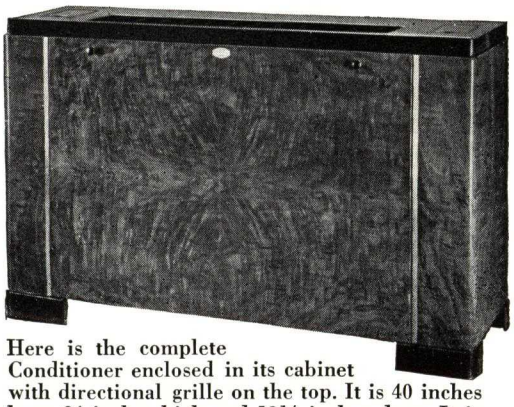
- No Ducts Required—No Tinsmithing
- No Special Framing of Floors or Partitions
- No Floor or Baseboard Registers
- Air Conditioners, Freestanding, Partly Recessed or Completely Recessed
- Slenderized Radiators Require Less Space or can be Recessed
- Requires only Space for the Boiler in the Basement

TO THE OWNER

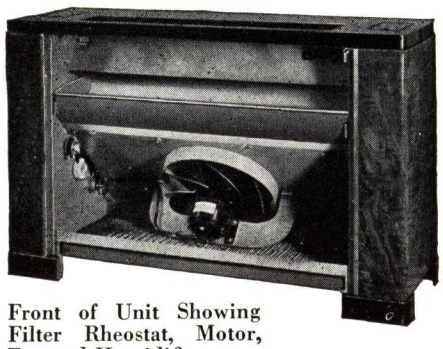
- No Floor Drafts
- Air or Odors Not Circulated Through the House
- Air Filtered, Humidified, Heated and Circulated in Rooms Requiring It
- Air Never Overheated
- Direction of Wind No Problem
- Any Room May Be Isolated In Case of Sickness Without Affecting System
- Individual Room Control

BURNHAM UNIT AIR CONDITIONER

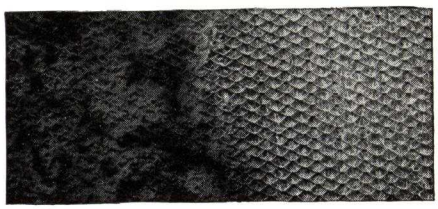
For Winter Air Conditioning And For Circulating Air In Summer



Here is the complete Conditioner enclosed in its cabinet with directional grille on the top. It is 40 inches long, 24 inches high and 13½ inches deep. It is connected to a steam vapor or hot water system the same as any radiator. Can be used on old or new installations.



Front of Unit Showing Filter Rheostat, Motor, Fan and Humidifier.



This shows the double spun glass filter after 3 months use. Half was cleaned off to show how effectually it cleans the air. Glass is oil-impregnated. Catches the finest of dust particles, even to the pollens so trying to asthma and hay fever victims.

This Unit Air Conditioner is a room type unit which is used in conjunction with any old or new type of radiator heat—Steam, Vapor or Hot Water.

No ducts, registers, big blowers or tinsmithing is required.

The performance of each unit is completely under thermostatic control.

The complete unit consists of an unusually handsome cabinet, heating element, humidifier with hand or automatic valve and overflow, filter, rheostat, fan, motor and thermostat.

Cabinet

40" long, 24" high and 13½" wide finished in Burled Walnut body with black top and legs, trimmed with satin finish stainless steel moulding. Cabinet encloses all piping and fittings. Special grill in top directs heat away from walls and draperies. Two invisible doors in top permit access to all controls within cabinet.

Heating Element

Heating element is of the finned type with a capacity of eighty (80) square feet, tapped both ends 1¼". Can be used with one or two pipe systems.

Humidifier

Humidifier is of the evaporator type, and includes the humidifier pan, hand valve and overflow. Evaporation capacity varies from 6 to 10 gallons per day. Automatic humidifier controls can be furnished at additional cost.

Filter

Filters are spun glass impregnated with an odorless oil which will clean the air of approximately 96% of dirt, dust, germs and pollen. They are of the inexpensive throw-away type and under average conditions should last one heating season. They are easily replaced by removing front panel of cabinet.

Rheostat

Rheostat controls speed of fan and capacity of heating element. At maximum speed, (900 R.P.M.) fan develops approximately four hundred (400) cubic feet of air per minute and heating element forty (40) square feet capacity.

At slowest speed (400 R.P.M.) fan develops one hundred fifty (150) cubic feet of air per minute and heating element forty (40) square feet capacity.

Any speed and capacity between maximum and minimum may be obtained by adjustment of Rheostat.

Fan

Fan is special design of multiple blades and dynamically balanced for noiseless operation. For Fan capacity, refer to information under "Rheostat."

Motor

Motor is of the shaded pole type and with occasional oiling (once per heating season) will last indefinitely. Although it is substantial in size and ruggedly built, it consumes only sixty-three (63) watts at top speed, nine hundred (900) R.P.M. and twenty-seven (27) watts at low speed, four hundred (400) R.P.M. Its horsepower rating is only 1/100th.

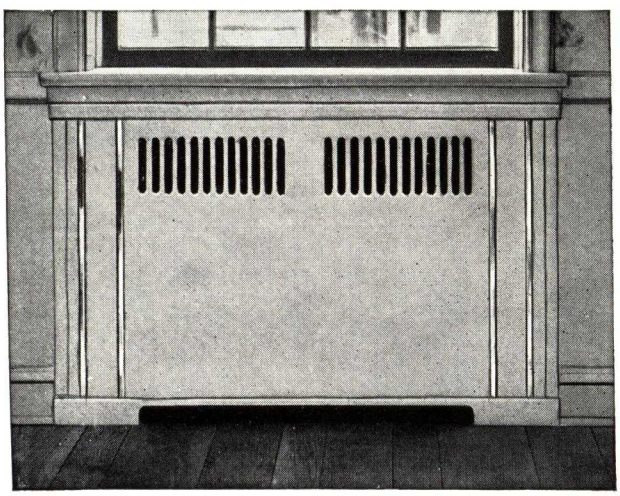
Can be furnished in 110 V. 60 cycle A.C., 120 V. 40 and 25 cycle A.C., and 115-120 V. D.C.

Thermostat

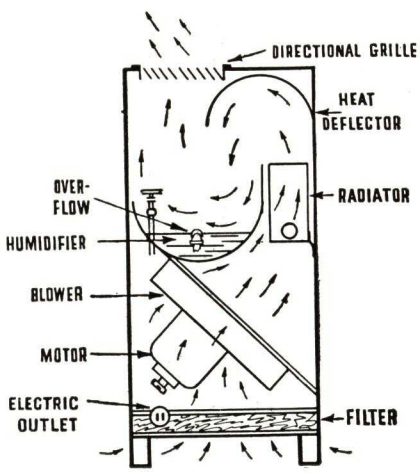
Thermostat is furnished complete with summer-winter switch. It is hooked up direct to the fan. When desired room temperature is reached the Thermostat stops the fan and no more heat is developed from heating element.

By throwing switch over to summer side. Thermostat controls temperature by circulation of room air only.

When desired, the unit can be either partially or entirely recessed with a special front panel.



Front for enclosing Built-in Conditioner



This diagramatic sketch shows how the cold layer of air is picked up from the floor, filter cleaned, heated, humidified and then evenly distributed throughout the entire room.

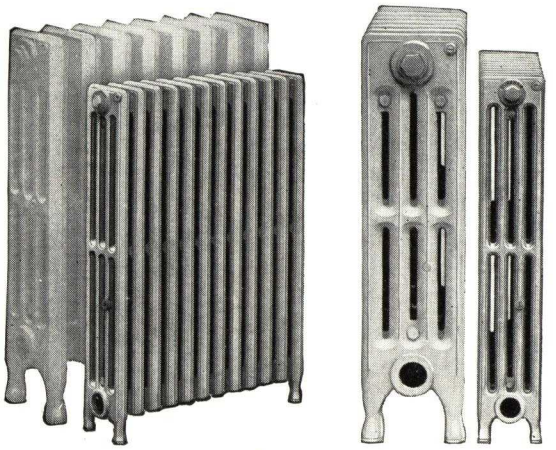
Thermostat

26
5

Require 40% Less Room — Heat 40% Quicker

The Slenderized Radiator being very narrow, a recess space can be made between the studding under the window, and the radiator set in it entirely out of the way. So good looking is this radiator, that it is being used extensively without any panel front or grille.

Because there is 40% less air to be pushed out for steam, and 40% less water to be moved for hot water, combined with the freer circulation of air between tubes and consequent increased contacting of the surfaces, heating is that much quicker.



Compare the Size of the Old Type Radiator with the Burnham "Slenderized" Radiator — Both have the same capacity.

Three Tube
3¼" Wide

Four Tube
4 7/16" Wide

Five Tube
5 11/16" Wide

Six Tube
6 15/16" Wide

THREE-TUBE — FIVE-TUBE

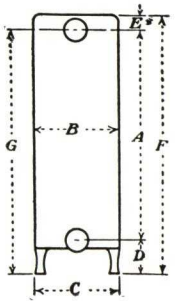
Number of Sections	* Length 1½ Ins. Per Section	19-inch Height — 1.1 Sq. Ft. Per Sec. — 0.733 Sq. Ft. Per Lineal In.	22-inch Height — 1.3 Sq. Ft. Per Sec. — 0.867 Sq. Ft. Per Lineal In.	25-inch Height — 1.5 Sq. Ft. Per Sec. — 1.000 Sq. Ft. Per Lineal In.	20-inch Height — 1.8 Sq. Ft. Per Sec. — 1.200 Sq. Ft. Per Lineal In.	23-inch Height — 2.1 Sq. Ft. Per Sec. — 1.400 Sq. Ft. Per Lineal In.	26-inch Height — 2.4 Sq. Ft. Per Sec. — 1.600 Sq. Ft. Per Lineal In.	32-inch Height — 3.0 Sq. Ft. Per Sec. — 2.000 Sq. Ft. Per Lineal In.
2	3	2.2	2.6	3	3.6	4.2	4.8	6
4	6	4.4	5.2	6	7.2	8.4	9.6	12
6	9	6.6	7.8	9	10.8	12.6	14.4	18
8	12	8.8	10.4	12	14.4	16.8	19.2	24
10	15	11.0	13.0	15	18.0	21.0	24.0	30
12	18	13.2	15.6	18	21.6	25.2	28.8	36
14	21	15.4	18.2	21	25.2	29.4	33.6	42
16	24	17.6	20.8	24	28.8	33.6	38.4	48
18	27	19.8	23.4	27	32.4	37.8	43.2	54
20	30	22.0	26.0	30	36.0	42.0	48.0	60
22	33	24.2	28.6	33	39.6	46.2	52.8	66
24	36	26.4	31.2	36	43.2	50.4	57.6	72
26	39	28.6	33.8	39	46.8	54.6	62.4	78
28	42	30.8	36.4	42	50.4	58.8	67.2	84
30	45	33.0	39.0	45	54.0	63.0	72.0	90
32	48	35.2	41.6	48	57.6	67.2	76.8	96
34	51	37.4	44.2	51	61.2	71.4	81.6	102
36	54	39.6	46.8	54	64.8	75.6	86.4	108
38	57	41.8	49.4	57	68.4	79.8	91.2	114
40	60	44.0	52.0	60	72.0	84.0	96.0	120
42	63	46.2	54.6	63	75.6	88.2	100.8	126
44	66	48.4	57.2	66	79.2	92.4	105.6	132
46	69	50.6	59.8	69	82.8	96.6	110.4	138
48	72	52.8	62.4	72	86.4	100.8	115.2	144
50	75	55.0	65.0	75	90.0	105.0	120.0	150

FOUR-TUBE — SIX-TUBE

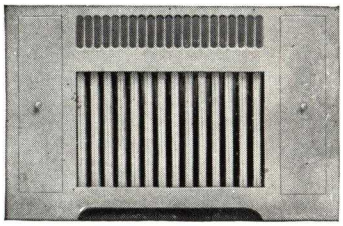
Number of Sections	* Length 1½ Ins. Per Section	19-inch Height — 1.4 Sq. Ft. Per Sec. — 0.933 Sq. Ft. Per Lineal In.	22-inch Height — 1.6 Sq. Ft. Per Sec. — 1.067 Sq. Ft. Per Lineal In.	25-inch Height — 1.8 Sq. Ft. Per Sec. — 1.200 Sq. Ft. Per Lineal In.	14-inch Height — 1.5 Sq. Ft. Per Sec. — 1 Sq. Ft. Per Lineal In.	17-inch Height — 1.8 Sq. Ft. Per Sec. — 1.2 Sq. Ft. Per Lineal In.	20-inch Height — 2.2 Sq. Ft. Per Sec. — 1.47 Sq. Ft. Per Lineal In.	26-inch Height — 2.9 Sq. Ft. Per Sec. — 1.93 Sq. Ft. Per Lineal In.
2	3	2.8	3.2	3.6	3.0	3.6	4.4	5.8
4	6	5.6	6.4	7.2	6.0	7.2	8.8	11.6
6	9	8.4	9.6	10.8	9.0	10.8	13.2	17.4
8	12	11.2	12.8	14.4	12.0	14.4	17.6	23.2
10	15	14.0	16.0	18.0	15.0	18.0	22.0	29.0
12	18	16.8	19.2	21.6	18.0	21.6	26.4	34.8
14	21	19.6	22.4	25.2	21.0	25.2	30.8	40.6
16	24	22.4	25.6	28.8	24.0	28.8	35.2	46.4
18	27	25.2	28.8	32.4	27.0	32.4	39.6	52.2
20	30	28.0	32.0	36.0	30.0	36.0	44.0	58.0
22	33	30.8	35.2	39.6	33.0	39.6	48.4	63.8
24	36	33.6	38.4	43.2	36.0	43.2	52.8	69.6
26	39	36.4	41.6	46.8	39.0	46.8	57.2	75.4
28	42	39.2	44.8	50.4	42.0	50.4	61.6	81.2
30	45	42.0	48.0	54.0	45.0	54.0	66.0	87.0
32	48	44.8	51.2	57.6	48.0	57.6	70.4	92.8
34	51	47.6	54.4	61.2	51.0	61.2	74.8	98.6
36	54	50.4	57.6	64.8	54.0	64.8	79.2	104.4
38	57	53.2	60.8	68.4	57.0	68.4	83.6	110.2
40	60	56.0	64.0	72.0	60.0	72.0	88.0	116.0
42	63	58.8	67.2	75.6	63.0	75.6	92.4	121.8
44	66	61.6	70.4	79.2	66.0	79.2	96.8	127.6
46	69	64.4	73.6	82.8	69.0	82.8	101.2	133.4
48	72	67.2	76.8	86.4	72.0	86.4	105.6	139.2
50	75	70.0	80.0	90.0	75.0	90.0	110.0	145.0

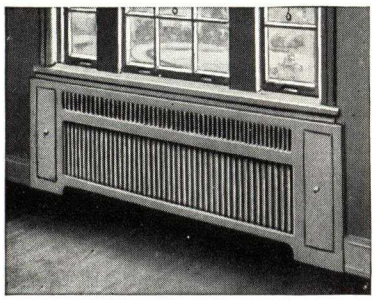
DIMENSIONS

Size	Dimensions, in inches A	B-C	D	E	F	G
26-6	21 7/16	6 5/16	3½	1 1/16	26	24 15/16
20-6	15 7/16	6 5/16	3½	1 1/16	20	18 15/16
17-6	12 7/16	6 5/16	3½	1 1/16	17	15 15/16
14-6	9 1/16	6 5/16	3½	1 1/16	14	12 15/16
32-5	27 7/16	5 11/16	3½	1 1/16	32	30 15/16
26-5	21 7/16	5 11/16	3½	1 1/16	26	24 15/16
23-5	18 7/16	5 11/16	3½	1 1/16	23	21 15/16
20-5	15 7/16	5 11/16	3½	1 1/16	20	18 15/16
25-4	21 1/16	4 7/16	2½	1 1/16	25	23 15/16
22-4	18 1/16	4 7/16	2½	1 1/16	22	20 15/16
19-4	15 7/16	4 7/16	2½	1 1/16	19	17 15/16
25-3	21 7/16	3¼	2½	1 1/16	25	23 15/16
22-3	18 7/16	3¼	2½	1 1/16	22	20 15/16
19-3	15 7/16	3¼	2½	1 1/16	19	17 15/16



BURNHAM PANEL FRONTS FOR RECESSED RADIATORS



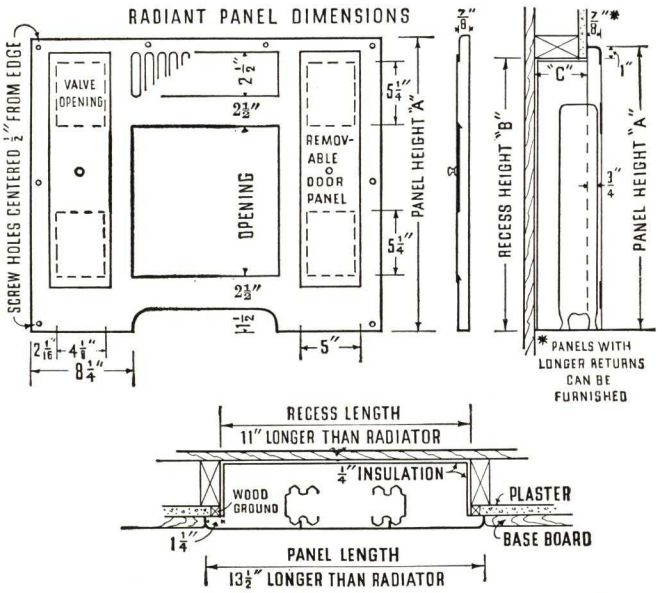


Panel Front

The Panel Front for the Recessed Slenderized Radiator screws directly on wall. Extends in room less than an inch. Removable panels on sides for reaching control valve. Main grille is formed by exposed radiator itself giving radiant heat. Top grille gives convected heat.

Radiators must be installed so that the front of radiator extends ¾" beyond plaster line.

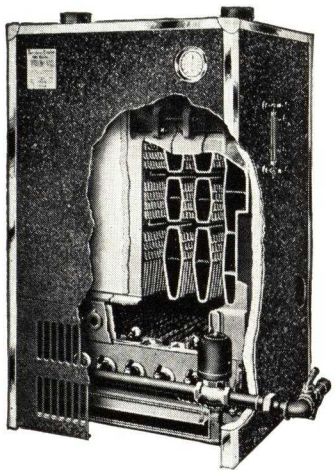
Radiators must be centered lengthwise in recess.



Radiator Height	"A" Panel Height	"B" Recess Height
19" or 20"	23¾"	22¾"
22" or 23"	26¾"	25¾"
25" or 26"	29¾"	28¾"

Radiator Width	"C" Recess Depth
3 Tube	3¼" Min.
4 Tube	4⅜" Min.
5 Tube	5⅝" Min.

BURNHAM SIMPLEX GAS BOILERS



JACKET — Rust-resisting steel, backed with thick improved air-cell insulation. Beautiful two-tone baked enamel finish. Jacket may be assembled after all piping has been installed and completely encloses all controls.

BURNHAM-SIMPLEX Gas Boilers may be installed in connection with the present radiators and piping. These boilers are constructed in accordance with the A. S. M. E. Code, and have been tested and approved under the recent and most rigid requirements of the American Gas Association Testing Laboratory.

BURNHAM-SIMPLEX Gas Boilers are equipped with dependable controls which supervise the operation of the heating plant with unfailing accuracy. A thermostatic pilot prevents the flow of gas to the burners unless the pilot is lighted. Steam pressure or water temperatures are always maintained within predetermined limits.

RATINGS

STEAM			WATER			STEAM AND WATER								
								Gas Consumption Cu. Ft. per Hour		Dimensions				
Steam Boiler No.	A.G.A. Steam Rating Sq. Ft.	Sq. Ft. Direct, C. I. Radn.	Water Boiler No.	A.G.A. Water Rating Sq. Ft.	Sq. Ft. Direct C. I. Radn.	Output B.T.U.	Boiler H. P.	500 B.T.U. Gas	1000 B.T.U. Gas	Hgt. Ins.	W. Ins.	D. Ins.	Water Line Inches	No. and Size Sup. and Ret. Tappings
2-SS	290	185	2-SW	470	300	70,000	2.1	175	87	55	15¼	36	40½	2-4"
3-SS	550	355	3-SW	880	575	132,000	3.9	330	165	55	19¾	36	40½	2-4"
4-SS	770	500	4-SW	1230	815	184,000	5.5	460	230	55	24½	36	40½	2-4"
5-SS	1000	660	5-SW	1600	1085	240,000	7.2	600	300	55	29	36	40½	2-4"
6-SS	1250	830	6-SW	2000	1380	300,000	9.0	750	375	55	33½	36	40½	2-4"
7-SS	1500	1010	7-SW	2400	1670	360,000	10.7	900	450	55	38	36	40½	2-4"
8-SS	1750	1190	8-SW	2800	1960	420,000	12.5	1050	525	55	42¾	36	40½	2-4"
9-SS	2020	1390	9-SW	3230	2280	484,000	14.5	1210	605	55	49¾	36	40½	2-4"
10-SS	2250	1560	10-SW	3600	2555	540,000	16.1	1350	675	55	54¼	36	40½	2-4"
11-SS	2500	1740	11-SW	4000	2860	600,000	17.9	1500	750	55	58¾	36	40½	3-4"
12-SS	2750	1885	12-SW	4400	3145	660,000	19.7	1650	825	55	63½	36	40½	3-4"
13-SS	3000	2110	13-SW	4800	3430	720,000	21.5	1800	900	55	68	36	40½	3-4"
14-SS	3250	2290	14-SW	5200	3715	780,000	23.3	1950	975	55	72½	36	40½	3-4"
15-SS	3520	2490	15-SW	5630	4020	844,000	25.2	2110	1055	55	79½	36	40½	3-4"
16-SS	3750	2665	16-SW	6000	4290	900,000	26.9	2250	1125	55	84⅛	36	40½	3-4"
17-SS	4000	2860	17-SW	6400	4575	960,000	28.7	2400	1200	55	88¾	36	40½	3-4"
18-SS	4250	3040	18-SW	6800	4860	1,020,000	30.4	2550	1275	55	93¼	36	40½	4-4"
20-SS	4770	3405	20-SW	7630	5450	1,144,000	34.1	2860	1430	55	105	36	40½	4-4"
22-SS	5250	3750	22-SW	8400	6000	1,260,000	37.6	3150	1575	55	114	36	40½	4-4"

BURNHAM OIL BURNING CAST IRON BOILER

Designed Exclusively for Use with Oil—Summer-Winter Hot Water

Capacities: Steam 725-1350 Sq. Ft. — Water 1160-2160 Sq. Ft.

26
5

FOR USE WITH ANY GOOD GUN TYPE OIL BURNER

DESIGN

This highly efficient jacketed boiler is designed especially for securing greatest economy with oil fuel, and is not limited to use of any particular oil burner.

Equipped for all-year-around hot water supply with provision made for six automatic controls insuring positive action and safety.

CONSTRUCTION

Cast iron square sectional, encased in heavy gauge steel jacket, attractively finished in two tone grey. Jacket of boiler is heavily insulated against heat and sound. Everything is built-in. Controls are in burner division, reached through door at back. Refractory furnished with boiler, also water heater, low water cut-off and draft adjuster.

The combustion chamber is lined with a special refractory, or fire-resisting material. Once it is hot, it holds the heat for an unbelievably long time. This is of great importance in causing the oil spray to at once vaporize the instant the burner starts. Insures perfect combustion and freedom from soot or smoke. It is the old principle of the warm engine of your car starting easily and developing full power quickly.

EQUIPMENT FURNISHED

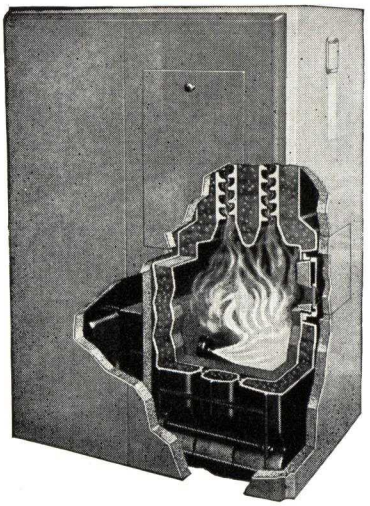
Steam Boilers—Water Heater, Low Water Cut-Off, Combustion Chamber Refractory, Metal Jacket (encloses Oil Burner and all controls), Steam Gauge, Safety Valve, Gauge Glass and Fittings, Try Cocks Adapter for Stackswitch and Flue Cleaning Brush. Draft Adjuster furnished on request.

Water Boilers—Water Heater, Draft Adjuster, Combustion Chamber Refractory, Metal Jacket (encloses Oil Burner and all controls), Altitude and Pressure Gauge, Thermometer, Adapter for Stackswitch and Flue Cleaning Brush. Draft Adjuster furnished on request.

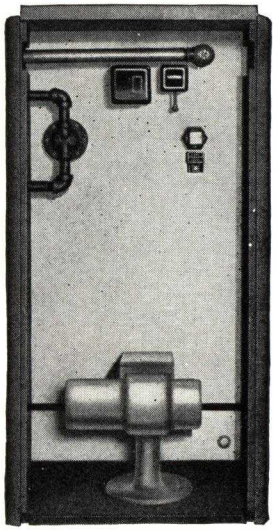
RATINGS

Steam		Water		*Water Heater Capacity Boiler 180°	Oil Req. to maintain Rated Capacity	No. & Size Sup. and Return Tappings
Boiler No.	Inst. Radn. Sq. Ft.	Boiler No.	Inst. Radn. Sq. Ft.			
SB	510	WB	820	66 Gals.	1.5 Gals.	2-3″
SC	760	WC	1220	66 Gals.	2.25 Gals.	2-3″
SD	960	WD	1540	66 Gals.	3.00 Gals.	2-3″

*Larger capacity water heaters can be supplied—See Price Sheet.

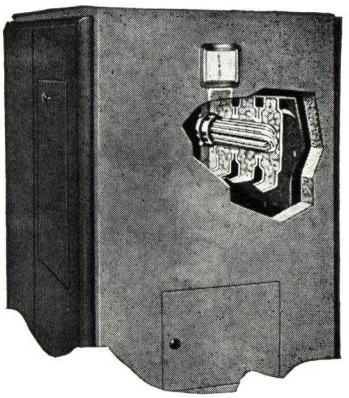


Note the strictly vertical flues and that the combustion chamber is completely surrounded by water. Also that Oil Burner is inside Jacket.



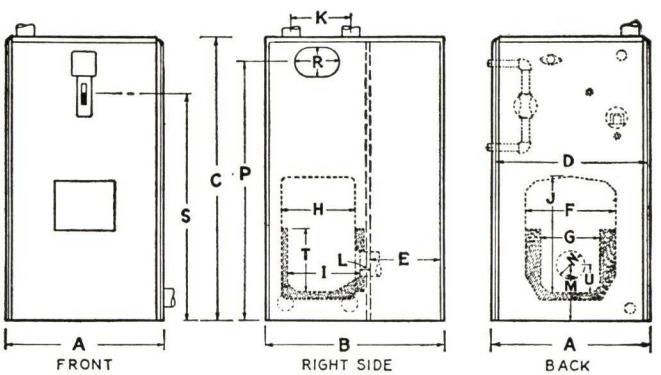
Showing convenient location of all controls when rear door of Jacket is removed. Note, too, that Oil Burner is protected from boiler heat by a heavy air cell insulating board.

One of the intermediate or in-between sections where the temperature gases come in direct contact with the teeth hereon, so effectually that 1600 to 1800 degrees of heat is absorbed by the patented fin flue walls and given to the water in about 19 inches of fire travel.



Taco Built-In Water Heater extends into every section of Boiler at the hottest point just below water line.

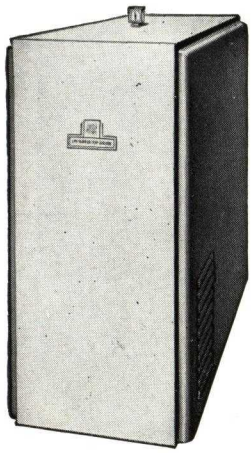
DIMENSIONS

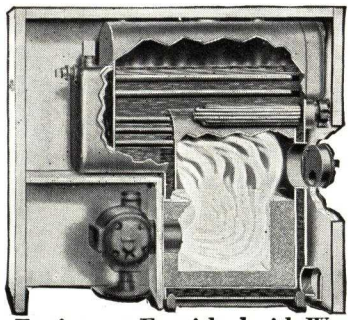


DIMENSIONS INCHES

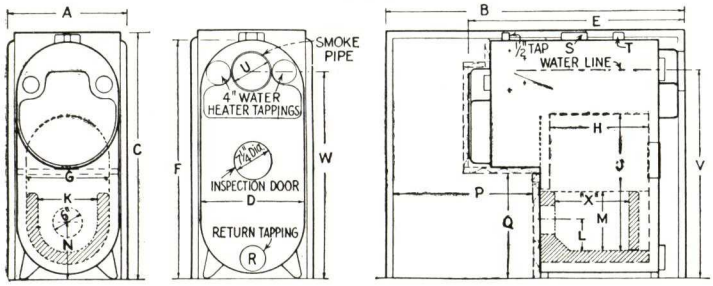
Boiler No.	A	B Short Jacket	B Long Jacket	C	D	E Short Jacket	E Long Jacket	F	G	H	I	J	K	L	M	N	P	R	S	T	U
B	29″	40″	50″	58″	28″	19″	29″	18⅜″	12¼″	15¼″	14½″	25½″	12⅛″	3″	11½″	5″	50½″	8″	46″	13″	5⅝″
C	29″	46″	56″	58″	28″	19″	29″	18⅜″	13¼″	21⅜″	17″	25½″	18¼″	3″	11½″	5″	50½″	9″	46″	13″	6⅛″
D	29″	52″	62″	58″	28″	19″	29″	18⅜″	14″	27½″	20″	25½″	24⅜″	3″	11½″	5″	50½″	11″	46″	13″	6⅛″

BURNHAM RESIDENCE TYPE
OB Series — Exclusively for Oil WELDED STEEL BOILERS





Equipment Furnished with Water Boiler—Enclosing Jacket, Combustion Chamber Refractory, Combination Altitude Gauge and Thermometer, Storage Type Taco Coil—capacity 66 Gallons, Flue Brush. Draft Adjuster furnished on request.



This series is of a modern design, compact in size and highly efficient. Two pass tubular construction with combustion chamber completely surrounded by water.

Built in accordance with A.S.M.E. Code.

Equipment Furnished with Steam Boiler—Enclosing Jacket, Combustion Chamber Refractory, McDonnell Low Water Cut-Off, Steam Vacuum and Pressure Gauge, Water Gauge Glass, Cocks and Tri Cocks, Safety Valve, Pressure Relief Door, Taco Storage Type Coil—capacity 66 Gallons, Flue Brush. Draft Adjuster furnished on request.

RATINGS

Steam			Water			Heating Surface Sq. Ft.	Furnace Volume Cu. Ft.	Oil Req. Gallons per Hr.
Boiler No.	S.H. B.I. Rating Sq. Ft.	* Net Load Rating Sq. Ft.	Boiler No.	S.H. B.I. Rating Sq. Ft.	* Net Load Rating Sq. Ft.			
OB- 50-S	500	385	OB- 50-W	800	615	29.4	5.2	1.35
OB- 70-S	750	578	OB- 70-W	1200	925	44.1	5.2	1.65
OB-100-S	1000	771	OB-100-W	1600	1235	58.9	9.5	2.00
OB-120-S	1250	964	OB-120-W	2000	1545	73.5	9.5	2.50
OB-150-S	1500	1157	OB-150-W	2400	1855	88.2	13.2	3.50
OB-170-S	1750	1350	OB-170-W	2800	2165	102.9	13.2	4.50

DIMENSIONS — INCHES

No. Boiler	A	B	C	D	E	F	N	P	Q	R	S	T	U	V	W	X
50	24	59	49½	22	45	48	11½	29	22½	4	4	1	8	41¾	39½	Adjustable to flame
70	24	59	49½	22	45	48	11½	29	22½	4	4	1¼	8	41¾	39½	
100	29	64	56½	27	50	55	12	29	25½	4	4	1¼	9	48	46⅛	
120	29	64	56½	27	50	55	12	29	25½	4	4	1¼	9	48	46⅛	
150	32	69	59½	30	59	58	13	29	26	5	5	1¼	10	50⅛	48¼	
170	32	69	59½	30	59	58	13	29	26	5	5	1¼	10	50⅛	48¼	

BURNHAM CAST IRON
ROUND SECTIONAL BOILERS

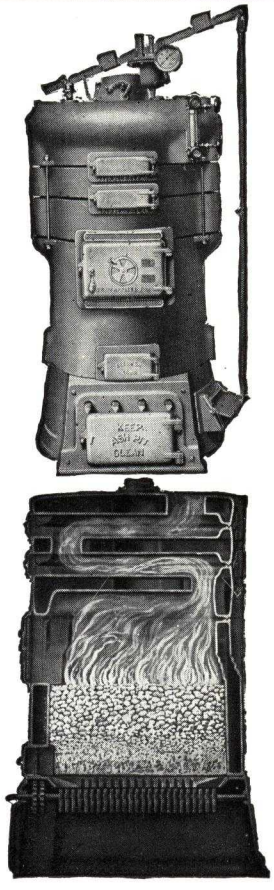
FOR COAL, OIL, GAS, STOKER FIRING — NOT JACKETED
Ratings: Steam 200-1040 Sq. Ft. — Water 330-1720 Sq. Ft.
FOR SMALL AND MEDIUM SIZE RESIDENCES
Small Stores, 2 Apartment Buildings, etc.

EQUIPMENT FURNISHED

Steam Boilers—Steam Gauge, Safety Valve, Gauge Glass and Fittings, Try Cocks, Automatic Damper Regulator, Set of Firing Tools consisting of Hoe, Poker and Flue Cleaning Brush.

Water Boilers—Set of Firing Tools consisting of Hoe, Poker and Flue Cleaning Brush.

Note—20″, 23″, 26″ and 29″ Boilers can be furnished with flat grates when so ordered.



RATINGS (For Coal, Oil, Gas or Stoker)

Boiler No.	Steam Rating Square Feet			Boiler No.	Water Rating Square Feet			Steam and Water				
	Installed Radiation	Hgt. Ins.	Dia. Ins.		Installed Radiation	Hgt. Ins.	Dia. Ins.	Dia. Comb. Chamb.	Gals. Oil per Hour	Chimney Size Inches	Chimney Size Feet	Sup. & Ret Tappings, Inches
S-1804	200	48	26	W-1804	330	42	26	18″	—	8x 8	30	2-2½
S-1805	220	53	26	W-1805	360	47	26	18″	.90	8x 8	30	2-2½
S-1806	240	58	26	W-1806	390	52	26	18″	1.00	8x 8	30	2-2½
S-2004	260	49	28	W-2004	430	43	28	20″	—	8x 8	30	2-3
S-2005	290	54	28	W-2005	480	48	28	20″	1.00	8x 8	30	2-3
S-2006	320	59	28	W-2006	530	53	28	20″	1.17	8x 8	30	2-3
S-2304	340	51	31	W-2304	560	45	31	23″	—	8x 8	30	2-3
S-2305	380	57	31	W-2305	625	50	31	23″	1.50	8x 8	30	2-3
S-2306	420	62	31	W-2306	690	55	31	23″	1.67	8x 8	35	2-3
S-2604	520	52	34	W-2604	860	45	34	26″	—	8x 8	35	2-3½
S-2605	570	58	34	W-2605	940	51	34	26″	2.00	8x 8	35	2-3½
S-2606	620	63	34	W-2606	1020	56	34	26″	2.16	8x 8	35	2-3½
S-2904	690	54	37	W-2904	1140	47	37	29″	—	10x10	35	2-4
S-2905	750	59	37	W-2905	1240	52	37	29″	2.53	10x10	35	2-4
S-2906	810	64	37	W-2906	1340	57	37	29″	2.73	10x10	40	2-4
S-31-4	900	56	41	W-31-4	1480	49	41	31″	—	11x11	40	2-4
S-31-5	970	62	41	W-31-5	1600	54	41	31″	3.00	11x11	45	2-4
S-31-6	1040	67	41	W-31-6	1720	60	41	31″	3.50	11x11	45	2-4

BURNHAM CAST IRON SQUARE SECTIONAL BOILERS

Coal or Oil Burning—Jacketed or Unjacketed

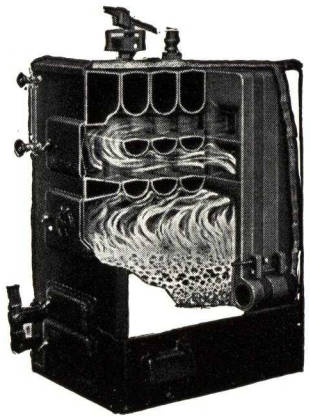
26
5

Capacities: Steam 220-4920 Sq. Ft. Steam Radiation
Water 340-7880 Sq. Ft. Hot Water Radiation

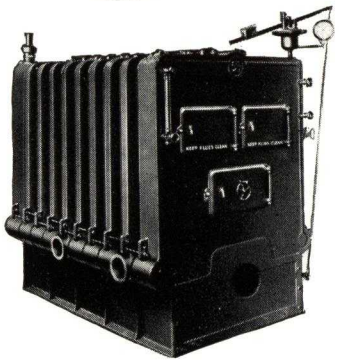
The superiority of this type of construction has been proven by years and years of unequalled service.

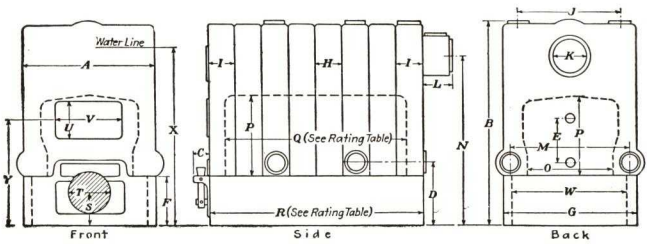
The combination of features herein listed provide for safe, economical and dependable performance.

A minimum of six (6) small balanced flueways
Tube-type rounded surface construction
Rust-proof section assembly
Short tie-bolted sections
Large nipple openings for faster circulation
Interchangeable sections
Extra heavy construction
Double-trussed, ridge-shaped grates
Clean-out doors all at front
Large fire doors
Ample size combustion chamber
Large steam generating area
Boilers tapped for hot water heaters and water feeders.



Jacketed No. 1 Series
For coal or oil





MEASUREMENTS

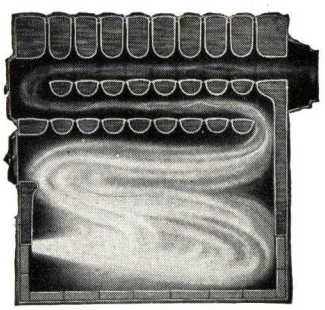
Series	A	B	C	D	E	F	G	H	I	J†	K	L	M†	N	O	P	S*	T*	U	V	W	X	Y
17″	24½	48	5	13	10	10	29	4	6	15¾	9	13½	17	39	17½	16	9½	7½	8	14	25	39	24
21″	29½	52½	5	16	10	13	25½	5	5	.....	10	4½	....	40¾	21	17½	9½	7½	8	14	21½	43¼	27½
27″	36½	58	5	17	10¼	14	36½	6	6	.....	12	5½	....	46	27	19¾	9½	7½	9	16	32½	47	30
36″	46	65	5	17½	10½	14	41	6	7	.....	15	7½	....	48½	36	23½	9½	7½	10	17½	36½	52	31½

* Apply to Oil Burning Boilers only. † Apply to 17″ Series only.

RATINGS (For Coal, Oil, Gas or Stoker)

Steam			Steam and Water				Water		
Jacketed Boiler No.	Un-jacketed Boiler No.	Installed Radiation sq. ft. Coal or *Oil	Supply and return tappings, in.	Grate area sq. ft.	Over-all length, in.	Chimney size in.—ft.	Installed Radiation sq. ft. Coal or *Oil	Un-jacketed Boiler No.	Jacketed Boiler No.
17-inch Series									
53-S	531-S	220	2-3	1.5	36½	8x 8x30	340	531-W	53-W
63-S	631-S	295	2-3	2.0	40½	8x 8x30	465	631-W	63-W
74-S	741-S	370	2-3	2.5	44½	8x 8x30	590	741-W	74-W
84-S	841-S	445	2-3	3.0	48½	8x12x35	715	841-W	84-W
95-S	951-S	520	2-3	3.5	52½	8x12x35	840	951-W	95-W
105-S	1051-S	595	2-3	4.0	56½	8x12x35	965	1051-W	105-W
116-S	1161-S	670	2-3	4.5	60½	8x12x40	1090	1161-W	116-W
126-S	1261-S	745	2-3	5.0	64½	8x12x40	1215	1261-W	126-W
21-inch Series									
2-S- 6	2106-S	625	2-3	4.01	40	12x12x35	1000	2106-W	2-W- 6
2-S- 7	2107-S	775	2-3	4.74	45	12x12x35	1240	2107-W	2-W- 7
2-S- 8	2108-S	925	3-3	5.47	50	12x12x40	1480	2108-W	2-W- 8
2-S- 9	2109-S	1075	3-3	6.20	55	12x12x40	1720	2109-W	2-W- 9
2-S-10	2110-S	1225	3-3	6.93	60	12x16x40	1960	2110-W	2-W-10
2-S-11	2111-S	1375	4-3	7.66	65	12x16x40	2200	2111-W	2-W-11
27-inch Series									
3-S- 6	2706-S	1000	2-4	5.86	47½	12x12x40	1600	2706-W	3-W- 6
3-S- 7	2707-S	1250	2-4	6.98	53½	12x16x40	2000	2707-W	3-W- 7
3-S- 8	2708-S	1500	2-4	8.11	59½	16x16x45	2400	2708-W	3-W- 8
3-S- 9	2709-S	1750	3-4	9.23	65½	16x16x50	2800	2709-W	3-W- 9
3-S-10	2710-S	2000	3-4	10.34	71½	16x20x50	3200	2710-W	3-W-10
3-S-11	2711-S	2250	3-4	11.48	77½	16x20x55	3600	2711-W	3-W-11
3-S-12	2712-S	2500	4-4	12.61	83½	20x20x60	4000	2712-W	3-W-12
36-inch Series									
.....	3606-S	1500	2-4	8.13	52	16x20x45	2400	3606-W	.....
.....	3607-S	1880	3-4	9.63	58	16x20x50	3010	3607-W	.....
.....	3608-S	2260	3-4	11.13	64	20x20x50	3610	3608-W	.....
.....	3609-S	2640	3-4	12.63	70	20x20x50	4220	3609-W	.....
.....	3610-S	3020	3-4	14.13	76	20x20x55	4830	3610-W	.....
.....	3611-S	3400	4-4	15.63	82	20x20x55	5440	3611-W	.....
.....	3612-S	3780	4-4	17.13	88	20x24x60	6050	3612-W	.....
.....	3613-S	4160	5-4	18.63	94	24x24x60	6660	3613-W	.....
.....	3614-S	4540	5-4	20.13	100	24x24x60	7270	3614-W	.....
.....	3615-S	4920	5-4	21.63	106	24x24x60	7880	3615-W	.....

*When boilers are wanted for oil burning, use boiler numbers as shown, preceded by the letter "O."



Square Sectional Conversion Boiler Equipped for Oil
By changes in base can be used for coal

Conversion Boiler

This boiler for oil burning can, by changes in the base, be easily converted for burning coal in case of coal becoming cheaper than oil, or for any objection to oil.

Smokeless

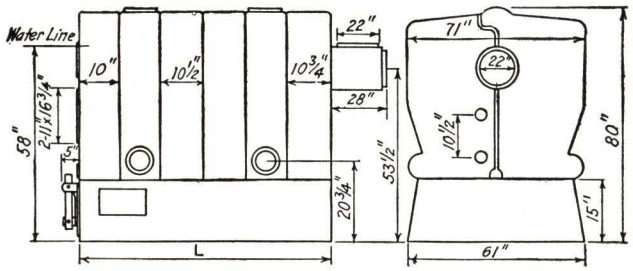
Smokeless Ratings and Data same as regular coal burning boilers. When Smokeless Boilers are wanted, use numbers as shown, preceded by the letter "S."

BURNHAM CAST IRON SQUARE SECTIONAL BOILERS

50" Twin Section Series—For Coal, Oil, Gas, Stoker Firing

Capacities: Steam 5000-14600 Sq. Ft.
Water 8000-23360 Sq. Ft.

Its looks deceive you. Looks as if it was no larger than the 36 inch. Looks that way, because of its *right proportions*. It is square shouldered and broad chested, just as you would expect of such a husky. The water boiler stands only 80 inches high over all. Is 71 inches wide.



RATINGS—COAL FIRED

Boiler No.	Steam Rating Sq. Ft. Installed Radiation	Boiler No.	Water Rating Sq. Ft. Installed Radiation	Steam and Water						
				No. of Sections	Sup. & Ret. Tappings Inches	Grate Area Sq. Ft.	Size of Grate Inches	Chimney-Size Inches	Chimney-Size Feet	L Length Base
5006-S	5000	5006-W	8000	**6**	3-5	19.27	50x 55½	24x28	70	63
5007-S	6200	5007-W	9920	**7**	3-5	22.92	50x 66	24x28	75	73½
5008-S	7400	5008-W	11840	**8**	4-5	26.56	50x 76½	24x28	80	84
5009-S	8600	5009-W	13760	**9**	4-5	30.20	50x 87	24x28	85	94½
5010-S	9800	5010-W	15680	**10**	5-5	33.85	50x 97½	30x36	85	105
†5011-S	11000	†5011-W	17600	**11**	5-5	37.50	50x108	30x36	95	115½
†5012-S	12200	†5012-W	19520	**12**	5-5	41.15	50x118½	30x36	100	126
†5013-S	13400	†5013-W	21440	**13**	5-5	44.80	50x129	36x36	100	136½
†5014-S	14600	†5014-W	23360	**14**	5-5	48.45	50x139½	36x36	100	147

† 10 Grates and Bridgewall furnished with these sizes.

BURNHAM FIRE TUBE WELDED STEEL BOILERS

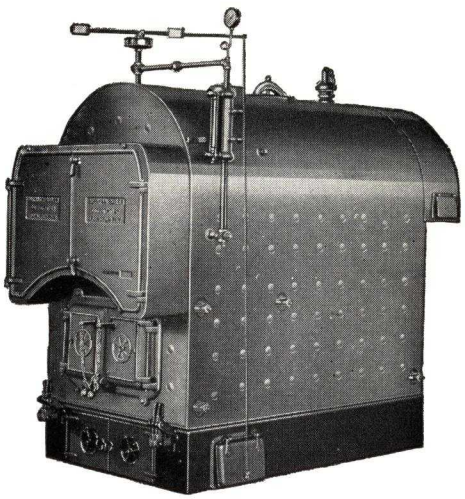
Compact Series—For Coal, Oil, Gas, Stoker or Smokeless

RATINGS

Hand Fired		Oil or Gas Fired		Stoker Fired High Firebox		Heating Surface Sq. Ft.	Grate Area Sq. Ft.	Water Line		Height Boiler Inches	
Boiler No.	S.H.B.I. Rating Sq. Ft.	Boiler No.	S.H.B.I. Rating Sq. Ft.	Boiler No.	S.H.B.I. Rating Sq. Ft.			Hand Gas or Oil Fired	Stoker Fired High Firebox	Coal Oil Gas	High Fire-box
36- 48	1800	36- 48	2190	A- 48	2190	129	7.9	57½"	60"	67⅞	70⅜
36- 58	2200	36- 58	2680	A- 58	2680	158	8.9	57½"	60"	67⅞	70⅜
36- 68	2600	36- 68	3160	A- 69	3160	186	9.7	57½"	61"	67⅞	71⅜
36- 78	3000	36- 78	3650	A- 79	3650	215	10.5	57½"	61"	67⅞	71⅜
42- 61	3500	42- 61	4250	B- 61	4250	250	11.4	66"	72¼"	81	87¼
42- 69	4000	42- 69	4860	B- 70	4860	286	12.2	66"	72¼"	81	87¼
42- 78	4500	42- 78	5470	B- 78	5470	322	13.4	66"	72¼"	81	87¼
42- 86	5000	42- 86	6080	B- 87	6080	358	14.5	66"	72¼"	81	87¼
48- 89	6000	48- 89	7290	C- 90	7290	429	16.4	68¼"	72⅜"	82¾	86⅞
48-104	7000	48-104	8500	C-104	8500	500	18.1	68¼"	73⅜"	82¾	87⅞
54- 88	8500	54- 88	10330	D- 87	10330	608	20.5	80½"	88½"	97	105
54-103	10000	54-103	12150	D-102	12150	715	22.5	80½"	90½"	97	107
60- 96	12500	60- 96	15180	E- 96	15180	893	25.6	90½"	100¼"	107½	117¼
60-114	15000	60-114	18220	E-114	18220	1072	28.4	90½"	103¼"	107½	120¼
66-118	17500	66-118	21250	F-118	21250	1250	30.9	92¾"	109¾"	111	126
72-121	20000	72-121	24290	G-121	24290	1429	33.2	95"	110½"	113¾	129¼
78-138	25000	78-138	30360	H-137	30360	1786	37.4	95½"	117¾"	116¾	139
84-118	30000	84-118	36430	J-118	36430	2143	41.2	113"	141"	136	164
84-137	35000	84-137	42500	J-137	42500	2500	44.7	113"	148"	136	171

Note—First set of numbers in Boiler No. indicates width; second, length of shell.

Capacities: Steam 1800-42500 Sq. Ft.



These electrically welded compact Steel Boilers are built in accordance with the A.S.M.E. Code and are rated in conformity with the Steel Heating Boiler Institute Code for rating low pressure boilers. Heating surface shown does not include bridge wall.

BURNHAM HOT WATER SUPPLY BOILERS

Test Pressure 300 lbs.—Working Pressure 120 lbs.

26
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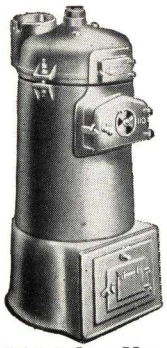


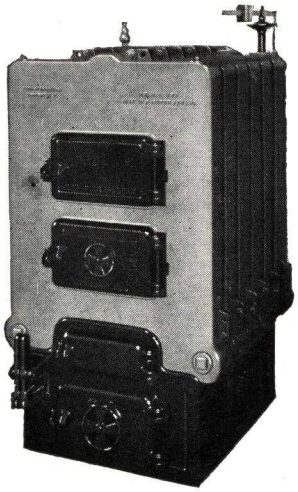
This is how Nos. 110, 112 and 114 look. Made in two sections and does a real job with very little fuel and bother.

These boilers are particularly adapted for furnishing hot water to residences, apartment houses, office buildings, hospitals, stores, theatres, restaurants.

DIMENSIONS AND RATINGS — ROUND SERIES

Boiler Size →	*110	*112	*114	H-1804	H-1805	H-2004	H-2005	H-2304	H-2305
Gallons Capacity—100° Rise 6 Hrs.	175	275	375	550	700	800	950	1100	1300
Rating. sq. ft.	125	200	300	550	600	725	810	990	1115
Diameter Grate, inches	10	12	14	18	18	20	20	23	23
Overall Height, inches	33¼	36⅝	39	42¼	47½	43¼	48½	45	50¼
Diameter Base, inches	16	18	20	26	26	28	28	31	31
Height Base, inches	9½	10⅝	11¾	11½	11½	12	12	13	13
Center Floor to Return Line Tapping, in.	11½	12¼	14⅛	14½	14½	14¾	14¾	16	16
Diameter Smoke Box, inches	5	5	7	7	7	7	7	8	8
Dimension Rear of Smoke Box to Center of Supply Tapping, inches	8⅜	9⅛	11	.....	.....	.....	.....	.....	.....
Size Supply Tapping, inches	2	2	2½	2½	2½	3	3	3	3
Size Return Tapping, inches	2	2	2½	2½	2½	3	3	3	3
Outside Diameter Firepot, inches	14	16	18	20¼	20¼	22½	22½	25½	25½

*Brass water sections can be furnished in sizes 11, 110, 112 and 114.



RATINGS — SQUARE SERIES

Series	Boiler No.	Gallons rating—100° 6 hours	3 hours	1 hour	Number of Families	Grate, in.	Grate area, sq. ft.	Number sup. and ret. tappings, in.	Length of comb. chamb., in.	Length of base, in.
17 Inch	H- 631	1000	500	167	15	17½x16	2.0	2-3	16	22
	H- 741	1300	650	217	20	17½x20	2.5	2-3	20	26
	H- 841	1600	800	267	25	17½x24	3.0	2-3	24	30
	H- 951	1900	950	317	30	17½x28	3.5	2-3	28	34
	H-1051	2200	1100	367	35	17½x32	4.0	2-3	32	38
21 Inch	H-2105	1700	850	280	28	21x22½	3.28	2-3	22½	26
	H-2106	2100	1050	350	35	21x27½	4.01	2-3	27½	31
	H-2107	2500	1250	420	42	21x32½	4.74	2-3	32½	36
	H-2108	2900	1450	490	49	21x37½	5.47	2-3	37½	41
	H-2109	3300	1650	560	56	21x42½	6.20	2-3	42½	46
	H-2110	3700	1850	630	63	21x47½	6.93	2-3	47½	51
27 Inch	H-2706	3900	1950	651	65	27x31¼	5.86	2-4	31¼	37
	H-2707	4400	2200	734	73	27x37¼	6.98	2-4	37¼	43
	H-2708	4900	2450	817	81	27x43¼	8.11	2-4	43¼	49
	H-2709	5400	2700	900	89	27x49¼	9.23	2-4	49¼	55
	H-2710	5900	2950	983	97	27x55¼	10.34	2-4	55¼	61
	H-2711	6400	3200	1066	105	27x61¼	11.48	2-4	61¼	67
36 Inch	H-3606	5000	2500	834	85	36x32½	8.13	2-4	32½	39
	H-3607	6000	3000	1000	100	36x38½	9.63	2-4	38½	45
	H-3608	7000	3500	1167	115	36x44½	11.13	2-4	44½	51
	H-3609	8000	4000	1333	130	36x50½	12.63	2-4	50½	57
	H-3610	9000	4500	1500	145	36x56½	14.13	2-4	56½	63
	H-3611	10000	5000	1666	160	36x62½	15.63	2-4	62½	69
	*H-3612	11000	5500	1833	175	36x68½	17.13	2-4	68½	75
	*H-3613	12000	6000	2000	190	36x74½	18.63	2-4	74½	81
	*H-3614	13000	6500	2166	220	36x80½	20.13	2-4	80½	87
	*H-3615	14000	7000	2333	250	36x86½	21.63	2-4	86½	93

*10 grates and bridgewall furnished with these sizes.

This little fellow is the No. 11 and an honest to goodness husky. Weighs 200 pounds with deep firepot and three (3) triangular revolving grates.

Capacity, gals....60 to 100
Tappings, 1″ Flow and Return, Height, in... 23
Depth of Fire Pot, in. 11½
Pipe Collar, in..... 5

Diam. of Top, in..... 20
Diam. of Lids—one, in. 9
Two-half of, in..... 9
Diam. of Grate, in.... 11

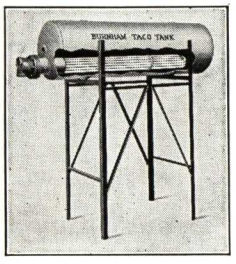
BURNHAM—TACO TANKS

SPECIFICATIONS

Capacity Gallons	TANK Size	Connections	Shell No. *	Head No. *	TACO No.	Heating Surface Sq. Ft.	Connections	Gallons Water Heated 100 Rise in 3 Hours Boiler 180°	Boiler 212°
40	14x60″	6-1″	10	7	4-48	6	2″	120	240
66	18x60″	6-1″	10	7	4-48	6	2″	120	240
82	20x60″	6-1½″	10	7	4-60	7½	2″	150	300
100	22x60″	6-1½″	9	7	4-60	7½	2″	150	300
120	24x60″	6-1½″	7	¼″	4-60	7½	2″	150	300
144	24x72″	6-1½″	7	¼″	4-72	9	2″	180	360
180	30x60″	6-2″	7	¼″	7-36	14	3″	280	560
220	30x72″	6-2″	5	¼″	7-36	14	3″	280	560
250	30x84″	6-2″	5	¼″	7-36	14	3″	280	560
315	36x72″	6-2″	¼″	5/16″	7-48	19	3″	380	760
365	36x84″	6-2″	¼″	5/16″	7-48	19	3″	380	760
420	36x96″	6-2″	¼″	5/16″	7-60	23½	3″	470	940
500	42x84″	6-2″	5/16″	⅜″	7-72	28	3″	560	1120

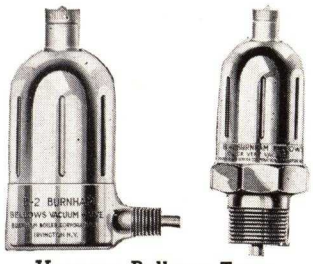
*Does not apply to Copper or Everdur Tanks.

	Test Pressure	Working Pressure
Galvanized (Copper Bearing Steel)	300 lbs.	127½ lbs.
Copper or Everdur	250 lbs.	106¼ lbs.



Designed to heat water all year 'round, summer or winter, when connected to an Oil, Gas or Stoker Fired, Steam, Vapor or Hot Water Heating System.
Stand furnished at extra cost

BURNHAM AIR AND VACUUM VALVES — Save Fuel

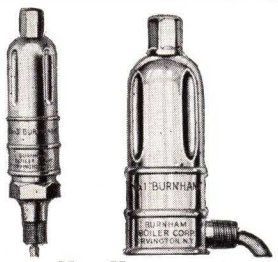


Vacuum Bellows Type

No. B2 No. B4

Burnham Adjustable Air and Vacuum Valves

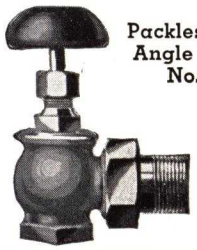
are so simple that anyone can operate them. The homeowner can easily study and balance his heating system. No tools are necessary. There are no caps to remove, no screws to loosen, no gear shifting. Just a turn of the visible, graduated adjustment and the job's done. The heating contractor need not keep returning to the job to re-balance the system. The cap is so designed that it cannot be shut off completely.



Non Vacuum

No. 3 No. 1

BURNHAM RADIATOR VALVES — Packless and Packed Types



Packless Type Angle Steam No. 23

Burnham valves have for many years enjoyed an enviable reputation among the trade.

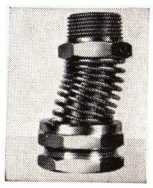
They are all constructed of extra heavy brass, and nickel plated. Rough bodies and polished trimmings.

Burnham Packless Valves will never need repacking and are so constructed that they can not leak around the stem.

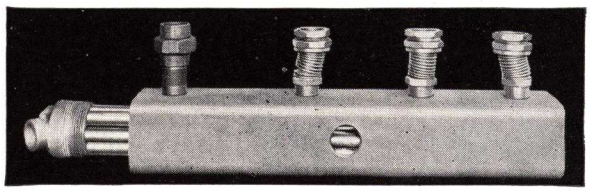
Burnham Packless Valves are of the quick opening type, carefully manufactured and tested.

Packed Type Angle Water No. 142

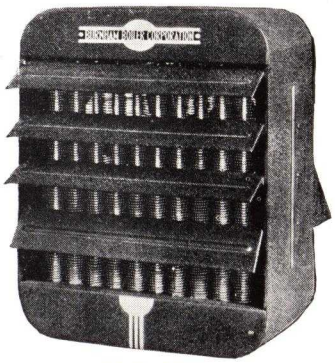
BURNHAM FLEXIBLE HEADERS, HEATERS, CONNECTORS



The enlarged view shows clearly how the flexible bellows can be offset in any direction to meet variation in section tappings. Cut at right shows the combination cast iron header with Taco coil inserted for hot water supply. Furnished with 1 rigid union and flexible connectors, ready to be attached to a boiler.



UNIT HEATERS BURNHAM FAN COOLER



Unit Heater

Burnham quiet operation Unit Heaters. Individual spiral fin copper tubes brazed into heavy all copper headers and then tinned to insure a permanent bond of fins and tubes. Compensated tube expansion prevents strain to the element.

Fan Cooler Specifications

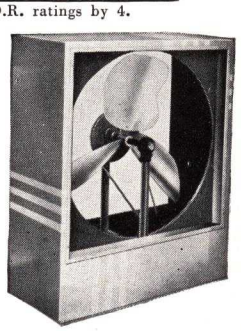
Fan Coolers have been tested and rated in accordance with the American Society of Heating and Ventilating Engineer's Fan Test Code.

Unit No.	E.D.R. Sq. Ft. **	B.T.U. Per Hour Air Enter. at 60° 2 lbs. Steam	C.F.M. at 70°	R.P.M.	Unit No.	E.D.R. Sq. Ft. **	B.T.U. Per Hour Air Enter. at 60° 2 lbs. Steam	C.F.M. at 70°	R.P.M.	Unit No.	E.D.R. Sq. Ft. **	B.T.U. Per Hour Air Enter. at 60° 2 lbs. Steam	C.F.M. at 70°	R.P.M.
	100	24,000	535	1500		240	57,500	850	1140		540	130,000	1700	1140
10B	*80	19,200	440	1000	16A	192	46,000	680	800	21D	433	104,000	1360	800
	*65	15,600	360	600		*156	37,400	560	600		*352	84,400	1100	600
	137	33,000	700	1500		275	66,000	1000	1140		700	169,000	2600	1140
12A	*110	26,400	570	1000	16H	220	52,800	800	800	24D	563	135,200	2100	800
	*90	21,500	460	600		*179	42,900	650	600		*458	109,900	1700	600
	146	35,700	680	1140		336	80,900	1380	1140		830	199,000	2700	1140
12B	119	28,600	551	800	16B	270	64,700	1100	800	24C	663	159,200	2150	800
	*97	23,200	450	600		*219	52,500	900	600		*539	129,300	1750	600
	170	40,800	830	1750		367	88,200	1100	1140		900	217,000	3000	1140
12E	136	32,700	680	1200	17D	294	70,500	880	800	24E	725	174,100	2400	800
	*110	26,500	560	800		*239	57,300	720	600		*589	141,400	1950	600
	205	49,000	900	1140		460	110,000	1500	1140		1030	247,000	4000	1140
14B	163	39,200	720	800	18B	367	88,000	1200	800	2 B	823	197,600	3200	800
	*133	31,800	590	600		*298	71,500	980	600		*668	160,400	2600	600

*Obtainable with three speed motors only. **To find pounds condensate per hour, divide E.D.R. ratings by 4.

Size	30″	39″	45″
Capacity	7,000 CFM	10,000 CFM	14,000 CFM
House size:			
Southern	7,000 cu. ft.	10,000 cu. ft.	14,000 cu. ft.
Northern	11,000 cu. ft.	15,000 cu. ft.	21,000 cu. ft.
Speed	510 RPM	370 RPM	310 RPM
Motor	¼ HP	⅓ HP	½ HP
Power	295 Watts	350 Watts	550 Watts
Weight	120 lbs.	200 lbs.	275 lbs.

The standard Burnham Fan Cooler, used as the basic unit of all models. By adding the proper equipment, it can be converted to any model for ventilating and circulating purposes.



Burnham has a three-quarters of a century background in designing and making heating equipment.

Five separate plants in different parts of the country.

Fifteen warehouses and sales offices located at advantageous points.

Burnham Boiler Corporation

IRVINGTON, N. Y. ZANESVILLE, OHIO

Warehouses and Sales Offices

Baltimore, Md. .....1201 Haubert Street
Boston, Mass. (Cambridge)
298 Albany Street
Chicago, Ill. ....1038 South Kolmar Avenue
Geneva, N. Y. .....Gates Avenue
Elizabeth, N. J. .....701 Spring Street
Irvington, N. Y. .....2 Main Street
CANADA—Toronto
Harbour Commission Building
Lancaster, Pa. .....Dillerville Road
Long Island City.....25-19 Borden Avenue
Philadelphia, Pa. ....31st & Jefferson Streets
Pittsburgh, Pa. .....301 Brushton Avenue
Queens Village, L. I.
222nd Street & L. I. R. R.
Springfield, Mass. .....153 Plainfield Street
Zanesville, Ohio .....Licking View
CHINA—Shanghai .....151 Avenue Foch

Plants

Elizabeth, N. J. Lancaster, Pa. Zanesville, Ohio
Irvington, N. Y. Geneva, N. Y.

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Burnham Boiler Corporation
IRVINGTON, NEW YORK

Carrier

26
6

FOR NEW AND EXISTING HOMES

The Carrier Home Air Conditioner Type 59F, replacing or complementing the ordinary heating system, furnishes the utmost in comfort and is flexible to meet the conditions in new or existing homes. Compactly built, to occupy minimum floor space, of test-proven parts, the conditioner combines heating by oil or gas, humidifying, cooling, dehumidifying, filtering, distributing and controlling conditions of air within the home. Its flexibility of use is illustrated below.

This unit will provide either conditioned air to the entire house, or is usable in the winter in conjunction with direct radiation in certain spaces such as the kitchen, garage or bath rooms where such "split-system" is often desirable.

The Conditioning Unit Type 59H (page 4) may be used instead of, or to complement either one of the combinations of the Type 59F Conditioner or the existing heating system in the home. It often furnishes air conditioning for a selected portion of the house, remotely located from the Type 59F Furnace and Conditioner.

The Furnace unit is designed for high efficiency and is adaptable to either gas or oil. It is also easily converted to the use of the opposite fuel. There is a 300 per cent range of capacity in the two sizes sufficient to make the unit usable for the small or large house. The Air Conditioner fits compactly on the furnace unit—the whole taking only about ten square feet of floor space, with a width of two and a quarter feet (small enough to pass through an ordinary doorway), by three feet, ten inches long.

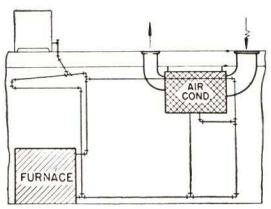
The Furnace unit design provides for the addition of a domestic water heater, either tank or tankless, for year-round operation, with control of burner independent of the room thermostats.

The filters are easily replaced from standing position and an especially large filter area is provided requiring less change. All parts are easily accessible. The factory assembly makes necessary only a minimum of field connections. This enables speed of installation.

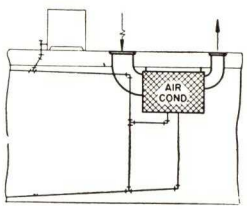
Acoustic treatment of the unit and flexible duct connections insures exceptional quietness. The attractive appearance of the finish makes the whole unit a pleasing addition to an attractive home.

A room thermostat controlling a modulating damper, regulating the air quantity passing over heating coil, permits sustained fan operation. The use of the modulating by-pass minimizes air stratification in rooms and temperature variation between rooms. This is a notable advantage. On and off control is also available.

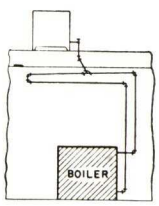
FLEXIBILITY OF INSTALLATION



Type 59F Furnace Unit serving remotely placed Type 59H Unit and direct radiation. (May be used without direct radiation.)



Type 59H Air Conditioner served by central station or other steam supply, which also serves other direct radiation.



Type 59F Furnace serving direct radiation—air conditioning to be added later.

DATA AND CAPACITIES
Type 59-F Furnace — Air Conditioner

Assembled as two major parts, the furnace and the conditioning unit are easily handled and accessible. The casing is of 18 gauge steel, finished in green baked wrinkle enamel. The fan especially designed for quietness is of the forward curve blade type accurately balanced.

Quiet design motors, for conditioner are capacitor start, induction run, 110 V, single phase, 60 cycle; for burner 1/8 HP, split phase, 110 V, single phase, 60 cycle or other currents are V-belt driven. The conditioner unit motor is mounted on plate isolated by resilient mounting, and cooled in the air stream.

Heating coils are fin type non-ferrous horizontally mounted, connected to common header both supply and return ends. The humidifier is the evaporating pan type of adjustable capacity. Filters are impact on viscous wax type, odorless, easily replaceable.

Boiler, specially designed for maximum efficiency, is fully insulated and has low water line (only 33″), is constructed from open hearth flange quality steel. The furnace is fitted with either a gas burner or for oil burning with tunnel firing. Can be converted to either fuel with little alteration. Boiler fitted with sight gauge safety valve, water level test cocks, drain, low water cut-off and pressure switch.

Heating of domestic hot water is obtainable by a water heater fitted into the boiler. Storage tank or tankless type water heaters are available. Temperature of the water is controlled by an aquastat which actuates burner independently of the room controls, both summer and winter.

During the heating season, under normal operation, the fan of the Type 59F Air Conditioner runs only when heat is required in the building. If no heat is needed, the thermostat stops the burner. When heat is required, the thermostat starts the burner. The fan starts (and runs) due to a secondary control, only when steam fills the heating coil.

The Type 59F Furnace-Air Conditioner has been approved for oil burning by the Underwriters' Laboratories and for gas by the A.G.A.

CAPACITIES AND OVERALL DIMENSIONS

AIR CONDITIONING UNIT

Size	Fan-RPM	Air-CFM	BTU Per Hour	Ht.	Lgth.	Width	Wt.
59F2	385-570	560-850	54,000-74,000	31¼″	67½″	27″	580
59F4	385-600	1000-1600	100,000-140,000	35⅞″	46″	27″	850

FURNACE FOR OIL

	Oil Rate G.P.H.	BTU Per Hour	Equiv. Dir. Rad. Sq. Ft.		Ht.	Lgth.	Width	Wt.
			Steam	Hot Water				
59F2	1.1-1.73	120,000-190,000	500- 790	800-1260	41¾″	46″	27″	1400
59F4	1.73-2.88	190,000-323,000	790-1350	1260-2160	41¾″	67½″	27″	2250

FURNACE FOR GAS

			Steam	Hot Water				
59F2		150,000	626	1000	41¾″	46″	27″	1200
59F4		260,000	1085	1385	41¾″	67½″	27″	1900

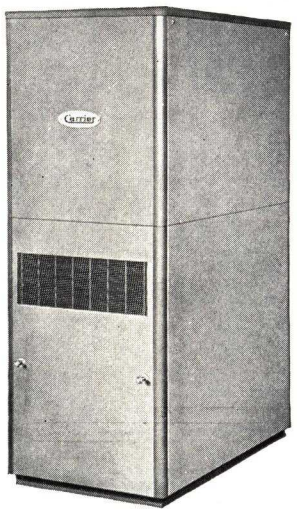
MOTOR SIZES

	Air Conditioner	Oil Burner
59F2	¼HP—110V—1PH—60C	⅛HP—110V—1PH—60C
59F4	½HP—110V—1PH—60C	⅛HP—110V—1PH—60C

COOLING CAPACITIES

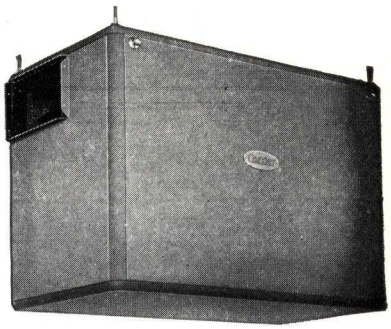
59F2	2 Ton Approx.
59F4	8½ Ton Approx.

Drain Connections—¾″, Drains Provided

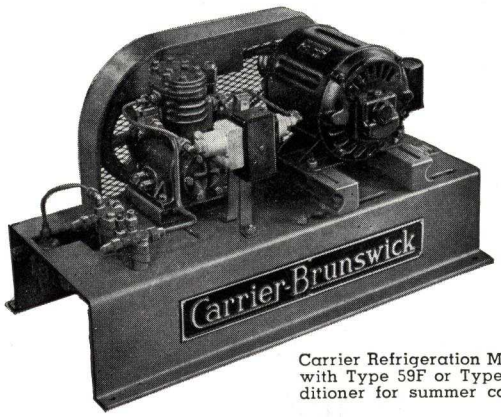


Type 59F Furnace-Air Conditioning Unit. Compactly assembled, available with side or top conditioned air outlets.

Type 59F Furnace, used separately, either oil or gas burner.



Type 59F Air Conditioning Unit used separately, side air outlets only.



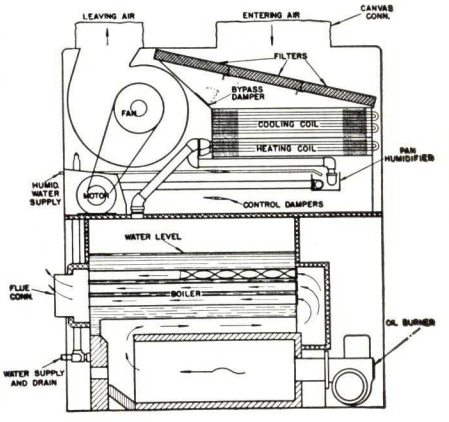
Carrier Refrigeration Machine—used with Type 59F or Type 59H air conditioner for summer cooling.

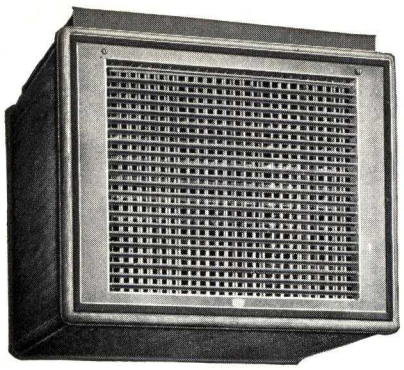
OPERATION CYCLE
Type 59F Home Air Conditioner, Oil Fired

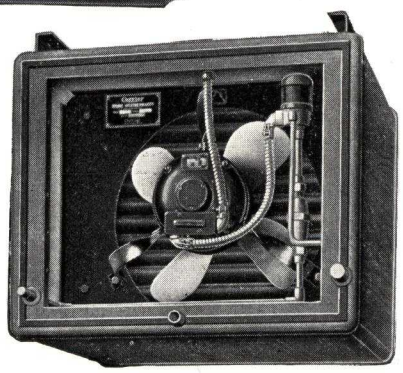
"Entering air" is drawn thru ducts as return from rooms above or from outside. It passes thru filters, the heating coil, then thru the humidifier chamber, and thru the control dampers into the fan. It is then discharged thru ducts into the conditioned spaces.

The oil or gas furnace supplies steam to the heating coil of the conditioning unit. Temperature is controlled by the room thermostat, actuating burner. The gases of combustion pass thru the fire tubes into the chimney connection. With the oil fired burner, the gases pass thru the tubes in a spiral motion for most effective use of the contained heat.

For superior temperature control, the by-pass and control dampers are actuated by the room thermostat, which by-passes a part of the room air around the heating coil.







TYPE 39D3 WEATHERMAKER

(Suspension Mounted)

USES—An economical, and efficient unit for cooling, dehumidifying, and circulating air in small areas.

DESCRIPTION—It is small, requires no floor space, a minimum of connections, eliminates expensive space alteration. It is suitable for single or multiple installations, with one or several units connected to a refrigeration machine remotely located (see page 14). Grained walnut metal casing harmonizes architecturally with practically any room treatment.

The unit may be suspended within the conditioned space, as has been the case in a great many small stores, restaurants or lunch counters, or it may be set into the wall with the adjustable outlet set flush with the finished wall, if there is ample space for inlet air to the unit. In some cases, a duct between a unit set thus and a grille near the floor has been used to provide room circulation of air.

OPERATION—A propeller fan, powered by a 1/15 hp. motor, forces air efficiently through cooling refrigerant coil, the chilled metal surfaces cooling the air and condensing out excess moisture. The adjustable outlet grille permits air to be distributed in the desired direction up to 30 ft. in front of unit. The inlet (back) side must be at least 8″ from the wall, to allow free air entrance.

This unit may be connected to outside air when positive ventilation of the space is desired, if the connecting duct is made short and of ample size. A lint screen is supplied to intercept fibrous particles.

A complete and accurate survey and computation of heat loads is absolutely necessary for this unit, as for larger installations.

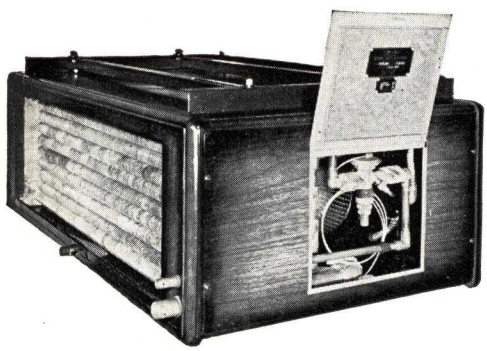
SPECIFICATIONS

Mounting—Universal suspension bracket for ⅜″ mounting rods.
Finish—Grain walnut or prime coat for repainting, metal casing.
Fan, Motor—1/15 Hp., 860 r.p.m., 110-volt, 60 cycle single phase (or other single phase current on order).
Refrigerant Connections—Freon or Methyl Chloride, ½″ o.d. inlet; ⅞″ o.d. outlet; copper tubing. Chilled water, ⅞″ o.d. inlet and outlet.
Cooling Effect—Up to 48,000 B.t.u. per hour. **Air Volume**—725 c.f.m.
Dimensions—Width: 25½″. Depth: 22″. Height: 20⅛″.
Weight—200 lbs.
Insulation—Refrigerant suction lines, or chilled water lines, should be insulated to prevent condensation.
Drip Pan for Condensate—Felt insulated, ¾″ pipe connection for drain.
Ventilation—Usually other than through unit. May be outside duct.

TYPE 39G7 WEATHERMAKER

Fan—Four bladed, aluminum, propeller type fan, mounted on shaft of ⅛ h.p., 1200 r.p.m., 110-volt, single phase, 60 cycle motor.
Coil—Seamless copper tubing with aluminum fins. All connections for ¾″ standard pipes; drain ½″.
Dimensions—22½″ high; 22½″ wide; 23″ deep.
Finish—Sea foam green lacquer.
Shipping weight—175 lbs.

TYPE 39J2 WEATHERMAKER



USES—Attractively finished, it is intended for location within conditioned areas. Its small vertical dimension requires no sacrifice in head room. Especially adapted to limited spaces over doors, show cases, cabinets, etc.

DESCRIPTION—This unit, similar in appearance to the 39D3, provides cooling, dehumidification and air circulation. Capacity ranges from 2 to 8 tons refrigeration effect.

The width of the unit permits adequate air distribution. Two centrifugal overhung fans, directly driven by one ¼ hp. motor, draw air over the cooling coils and discharge through two separate adjustable grilles. Air may be distributed in the direction desired from 20 to 50 feet in front of unit, depending on outlet adjustment.

The Type 39J2 unit is shipped completely assembled. Cooling coils are available for Methyl Chloride, Freon, or for chilled water. The only connections necessary are for electricity, refrigerant and a drain for condensation. The source of cooling is usually located outside of the conditioned space.

OPERATION—Intended for free air delivery, this unit can be used if necessary with short ample sized ducts. Ventilation is obtainable through an outside air connection to the unit.

It is necessary that adequate and accurate study be made to determine the best location of one or more 39J units to serve a given space. Some of the factors are: physical characteristics of the space; required air distribution; distribution of the heat load; possible support; architectural harmony; location of refrigeration machines; available outside air connections; cost of erection.

This unit, like the Type 39D unit, is frequently installed behind a wall of the conditioned space, with the adjustable grille flush with the inside finished wall.

The grille adjustment feature makes up to a 30° distribution above or below horizontal and to right or left of vertical. Adjustment to give a longer blow may result from converging air streams.

The cooling effect is controlled through the refrigerant expansion valve.

SPECIFICATIONS

Casing—Stamped metal, finished either in grained walnut or prime coat for repainting to match decoration. Insulated.
Fans—Two quiet multi-blade, forward curved, aluminum fans, mounted on shaft driven by ¼-hp., 870 r.p.m., 110-220 V., 50, 60 c., 1 ph. motor.
Coils—Aerofin, helically wound, metallically-bonded fins for direct expansion methyl chloride or Freon refrigerant or for chilled water.
Condensate Drip Pan—Mounted under coils to remove moisture taken out of air. Coated with corrosion-resistant paint and insulated.

Refrigerant Connections—	Inlet	Outlet
Methyl chloride or Freon	*⅞″	*⅞″
Chilled water	**1″	**1″

*o.d. tube **pipe

Drain Connections—¾″ pipe with brass dirt screen.
Electrical Connections—Motor connections brought to junction box inside unit. Conduit carried to connector on top of box.
Dimensions—Width: 50″. Height: 16½″. Depth: 29½″.

TYPE 39Q AND 39R WEATHERMAKERS

USES—These units are widely used for complete air conditioning of medium sized spaces such as stores, offices, hotels, factories and other similar types of space.

DESCRIPTION—The five sizes available range in cooling capacity from 2 to 40 tons for a single unit, making for wide flexibility in use.

The inlet air is filtered through easily replaceable, throw-away type, spun glass filters, or if desired, honey comb impact type.

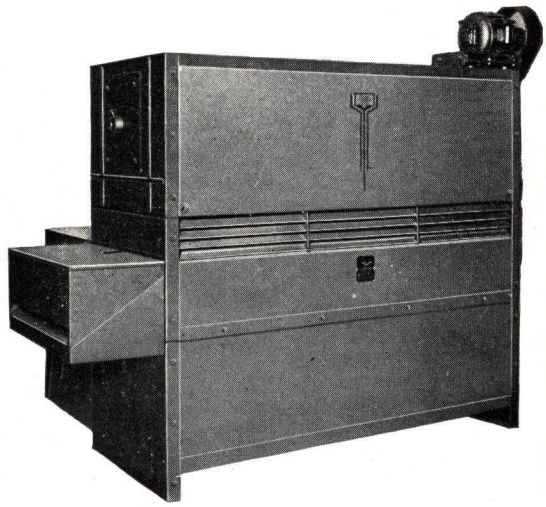
The basic units are sectionalized—the fan section, coil section and drip pan section for condensate, thus facilitating handling, erection and location.

For superior control of conditions in the room, the units are fitted with return air by-pass, to combine a portion of room air with newly conditioned air. The 39Q models are designed for floor mounting.

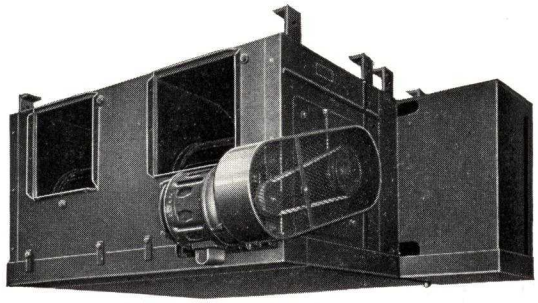
OPERATION—Ordinarily, the conditioning unit is set outside of the conditioned space and ducts lead the conditioned air to the design locations in the room or series of rooms. However, the attractive finished appearance of the unit makes it possible to house the entire unit in the conditioned space. Depending on the particular requirements, the conditioned air may be distributed directly from the unit or through ducts leading to the conditioned space.

For summer conditions, cooling may be accomplished by one or more refrigeration machines expanding refrigerant into the cooling coils of the Weathermaker or the coils may be directly connected to a cold water or brine circulation system. In the winter, steam is supplied to the heating coils, and humidifying heads used to supply necessary moisture.

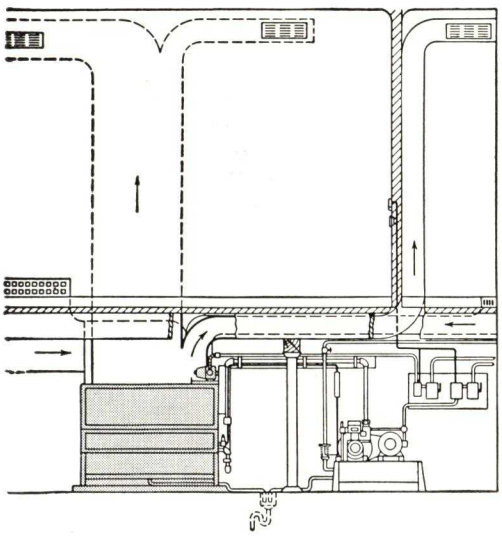
The 39R Weathermakers are designed for suspension mounting either inside or outside of the conditioned space in the same manner as the 39Q type. The advantage of this model is the saving in floor space possible, which may be essential in certain areas of small commercial establishments, offices, or factory installations.



Front View 39Q Showing Grilles for Recirculated Air Inlet



Outlet End of 39R Unit, Fans Visible Through Outlet Opening



Typical installation of a 39Q unit located on a floor below the conditioned space, distributing the conditioned air to it through ducts and scientifically designed outlets.

SPECIFICATIONS

Assembly—Unit divided into fan coil and drip pan sections to facilitate handling and installation. Fan section on 39Q units (except 39Q9, ordered as required) may be placed to discharge air horizontally or vertically. The 39R model has horizontal air discharge.

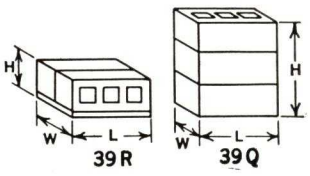
Fans—Double inlet, centrifugal, die-formed, electrically welded steel. Efficiency much greater than usual multi-blade types. Access provided for endwise removal.

Cooling Coils—Aerofin, seamless copper tubing, with helically-wound, metallically-bonded fins. Special header provides uniform refrigerant distribution throughout coils.

Heating Coils—Aerofin, silver brazed joints, designed to relieve expansion and contraction stresses.

Connections—Steam and refrigerant connections external at end of unit.

Humidifiers—Steam heated evaporators or atomizers as accessory installations in ducts.

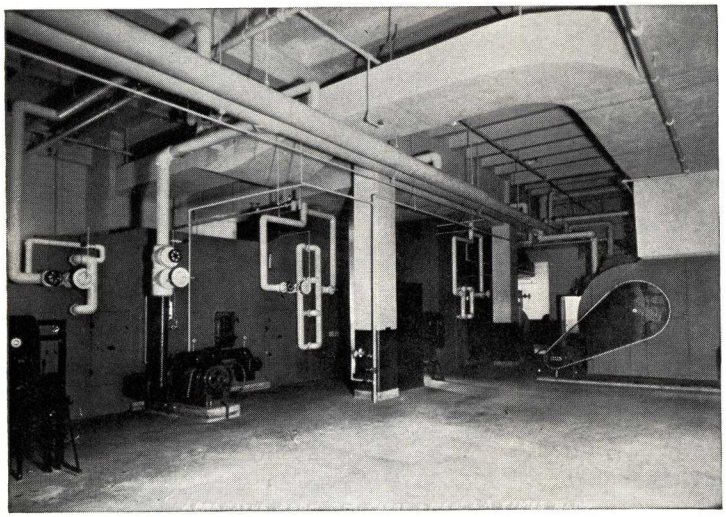


DIMENSIONS AND PHYSICAL DATA

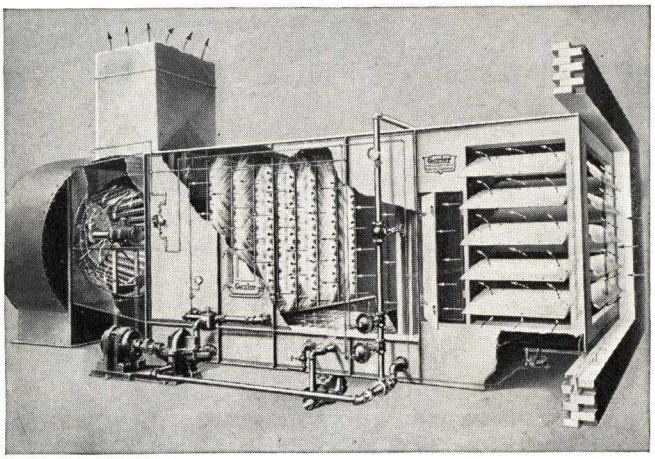
Unit No.	*Base Dimensions, inches			**Space required, inches			Tonnage Range	Average Heating Capacity Btu/hr	Fans Max. C.f.m.	Motor hp. Range	Air Filters		
	L	W	H	L	W	H					No.	Size in.	Wt.
39Q1	27 1/4	21	63 1/2	41	59	75 1/2	1-5	50,000	1000	1/4-1/2	2	10x20	717
39R1	27 1/4	35 1/2	23 3/4	41	70	36 1/2					2	16x20	707
39Q2	46 1/2	21	63 1/2	60	59	75 1/2	2-10	100,000	2000	1/4-3/4	6	16x20	1053
39R2	46 1/2	35 1/2	23 3/4	60	70	36 1/2							1033
39Q6	59 1/2	28	63 1/2	78	69	79 1/2	5-20	200,000	4000	1/2-1 1/2	9	20x20	1558
39R6	59 1/2	42 1/2	30 3/4	78	84	46 1/2							1538
39Q7	85 1/4	28	63 1/2	104	69	79 1/2	7-30	300,000	6000	3/4-2	12	20x20	2170
39R7	85 1/4	42 1/2	30 3/4	104	84	46 1/2							2120
39Q9	85 1/4	36 1/2	70 1/2	104	82	86 1/2	10-40	400,000	8000	1-3	15	16x25	2440
39R9	85 1/4	42 1/2	39 1/4	104	88	55 1/2							2385

*Bare unit without motor, belt guard, filter box, and control box.

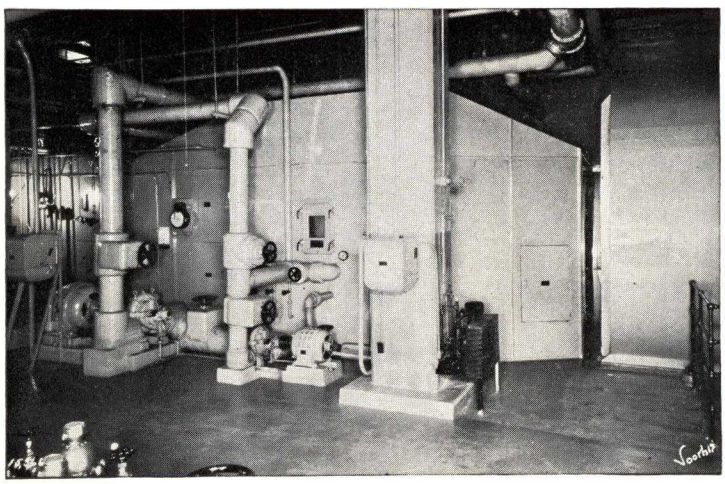
**Space required for proper installation including motor, belt guard, filter box, control box, and space on side opposite filters (39Q) or under unit (39R) to gain access to fans. Does not include space at end for removal of fan assembly or coils.



Equipment Room Showing a Large Central Plant System



Cut Away Section of Central Plant Air Conditioning Equipment



A Dehumidifier and Fan Section of a Central Plant

LARGE CENTRAL PLANT

USES—This type of system is generally used in theatres, large department stores, printing press rooms, office buildings, factories, large restaurants, and other spaces requiring large capacity of air conditioning.

DESCRIPTION—The central plant system is ordinarily distinguished from the so-called unitary type by the fact that the air conditioning and refrigeration apparatus are located at some central point to serve the entire building or space. It is also distinguished by the fact that the air conditioning equipment is job-assembled of selected parts of a size to give the desired capacity, instead of using a series of factory-assembled units of sufficient size and location to accomplish the desired results. The central plant system is "custom-built" instead of "off-the-shelf."

Ordinarily, the central plant system has a larger capacity than is available with any such factory assembled unit.

Complete and accurate study is necessary to determine the economic type, size and location of the equipment. Sometimes there may be two or more central "stations", each to serve a part of the conditioned space, with air distribution ducts leading to it. The choice of equipment depends on many factors involved on each particular space to be conditioned.

OPERATION—In some cases, the spray type dehumidifier may be used, in other cases, the cooling and dehumidification of the air is accomplished by passing it through finned coils containing refrigerant, brine or cold water, or there may be a combination of the two types, as in the Type 29N Unit (see page 9).

The conditioned air is distributed from the central station apparatus to the conditioned spaces through scientifically designed duct work and outlets (see page 10) or through a special type of distribution system such as the 36B Weathermaster Unit (page 5).

Refrigerated spray water for the air conditioning apparatus is usually obtained by mechanical refrigeration, although under favorable conditions, if very cold and in sufficient quantity, deep well or city water may be used, to remove excess heat and moisture from the air.

The cut-away section on the left indicates the operation of a central plant system. Outside air and possibly a portion of returned room air enters at the right end of the plant and may or may not pass through preheating coils, before it enters the spray (or cooling coils) chamber. Here the air is cleaned and cooled by contact with the cold water spray (or coils) and the excess moisture removed by condensation, or required moisture added. The air is then taken through reheating coils, to be brought up to proper conditions, mixed with the by-passed room air (see below), and be forced by the fan through ducts to the conditioned space.

ADVANTAGES OF THE BY-PASS IN AIR CONDITIONING

Use of the by-pass in air conditioning has been found of great benefit because it provides simultaneous and independent control of both temperature and humidity. According to this method a portion of the return air from the conditioned space enters the apparatus immediately before the fan where it diffuses with the newly conditioned air. While a very appreciable part of the benefit is the economy in refrigeration required for spray water, due to the smaller percentage of total air taken thru the spray, a much greater benefit is the sensitivity and range of control possible with such an arrangement. The relative humidity can be kept lower than is practical without using the by-pass and extremes in temperature are avoided, with a consequent economy in original cost of installation and yearly operation.

TYPE 29R SURFACE TYPE DEHUMIDIFIER

USES—This unit has wide use both as a part of a built-up central plant system where several of the units may be used in combination. It also may be used individually, installed directly in duct work to cool and dehumidify.

OPERATION—Cooling and dehumidifying occurs when the air is passed through Aerofin, non-ferrous metal coils containing refrigerant, brine, or cold water. The air gives up excess heat to the chilled coils with their helically wound, metalically bonded fins, at the same time depositing excess moisture in the form of condensate which accumulates in the drip pan and is taken to the drains. The unique Carrier method of centrifugal refrigerant distribution to the coils insures even cooling.

DESCRIPTION—Optional equipment with this type of unit includes auxiliary spray of centrifugal nozzles assembly for city water or recirculated water to keep the coils wet, and also to provide a flushing action, important in many cases for cleansing and preventing odors. The wet coils give evaporative cooling effect to the air.

Various combinations of the sections can be built up with or without filters, preheaters, return air connection, flushing sprays, by-pass, etc. to suit particular conditions. This results in wide flexibility of application and installation.

Assembly is one to four or more unit sections stacked vertically and bolted rigidly together. Available in nine sizes, each of three widths to give required capacity. All elements furnished either right or left hand. Casing of best grade copper bearing steel, all sheaths and angles galvanized, aged and protected with two coats of corrosion resistant paint. Equipped with shallow or deep drip pan.

The application of direct expansion cooling for large areas becomes standardized. With chilled water, the closed system simplifies piping and pumping for multiple dehumidifiers at different elevations. The closed system eliminates corrosion and cleaning problems found in open systems due to air contamination.

PERFORMANCE SUMMARY

Air Capacities—In small increments from 4000 to 29,970 cfm.

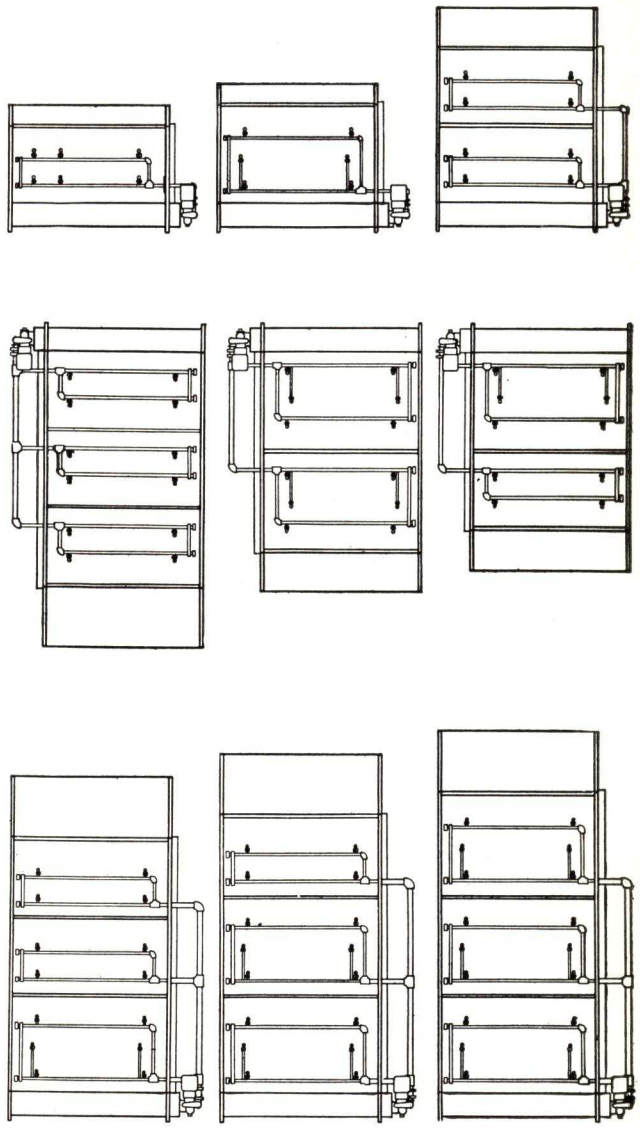
Cooling Effect—From 3 to 104 tons for direct expansion.

Saturation Efficiency—For dehumidification 80% contact (20% by-pass) for 4-row coils; and 90% contact (10% by-pass) for 6-row coils.

For humidification and evaporative cooling: 80% saturation efficiency with recirculating sprays. 50% saturation efficiency with direct city water sprays.

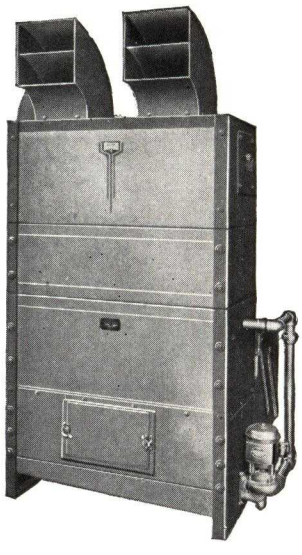
Spray Water Capacity—Recirculating Sprays—approximately 0.8 gpm per sq. ft. of coil face area at 12 ft. head. Direct city water sprays—approximately 0.11 gpm per sq. ft. of coil face area at 25 lb. pressure.

Rated Air Resistance—Resistance at maximum air quantity with recirculating sprays (See Table 8 for complete ratings). 4-row coil 0.62″ water; 6-row coil 0.88″ water.



UNIT ASSEMBLIES
Recirculated Water—Left-hand Units with By-pass Shown
Each Assembly Available in Three Widths

SMALL CENTRAL PLANT TYPE 43Q INDUSTRIAL WEATHERMAKER



This unit is primarily for the production of atmospheric conditions required in industrial applications . . . printing shops, textile mills, etc. In reality a small central station plant, this Weathermaker may be connected with ducts to distribute air to portions of the conditioned space remote from the refrigeration or heating source.

The unit is made up of a motor-driven fan section, a spray and coil section, eliminators, motor-driven pump and special air intake. Heater coils may or may not be used. Unit may be equipped with by-pass to mix conditioned air from room with that which has passed through the conditioning machine. These units are designed for cooling, heating, dehumidification, humidification, ventilation, filtration and circulation.

SPECIFICATIONS

Unit No.	Max. c.f.m.	No. Fans	Ranges, motor hp.	Overall dimensions, inches		
				Width	Length	Height
43Q2	2000	2	¼-1	26	58½	91⅛
43Q6	4000	2	½-2	33	76½	110½
43Q7	6000	3	¾-3	33	102¼	111⅜
43Q9	8000	3	1-3	2	102¼	112¼

26
6

When the air conditioning equipment is located outside of the conditioned space, means must be provided to convey the air to, and properly distribute it in, the conditioned areas. This is accomplished by means of duct work and outlet grilles. Air distribution may be controlled automatically or manually as to direction, quantity and temperature, depending on the desired conditions.

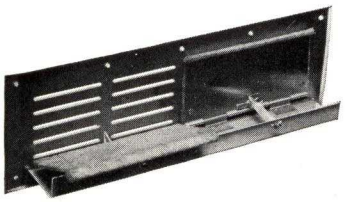
It is essential that the duct system be designed to fit the correct conditions of air quantity and movement. Careful and scientific estimate of heat load, quantity, concentration and variation must precede selection of the distribution system. Friction losses in the ducts must be accurately predicted. The selection may be based to a large extent on how it will fit into the building structure economically. Particular conditions may require acoustic treatment of the duct work; vanes in elbows will determine duct size necessary for designed air velocity.

The selection of the air outlet depends on size of the room, ceiling height, desired length of blow, occupancy, quantity and variation in heat load, velocity and quantity of air, appearance and type of room decoration.

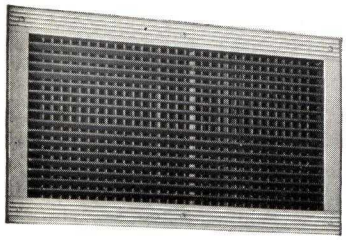
CARRIER GRILLE OUTLETS

Type 35C1 Slotted Outlet

Front View of 35C1 Outlet with Snap Damper



Rear View 35C1 Outlet with Snap Damper



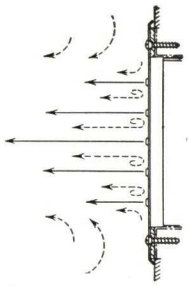
Type 35C5 Adjustable Outlet

Type 35C1 Slotted Outlets

This type of outlet is intended for use in either unitary or central station duct distribution systems and for either concealed or exposed duct work.

The primary air, introduced in multiple streams through slots in the outlet, induces a large secondary air flow, giving a recirculation effect in the room. Thus, a small quantity of high velocity (up to 2500 fpm) and high static pressure air (up to .04") at a temperature 20° to 25° below room temperature diffuses rapidly with a large quantity of room air. This permits smaller and less extensive duct systems.

In spaces where a wide variation in room load or use, such as in a series of hotel private dining rooms, is anticipated, manually operated snap dampers are often used for conditioned air supply. They are available for fully open or closed positions and for one, two, or three rows of slots.

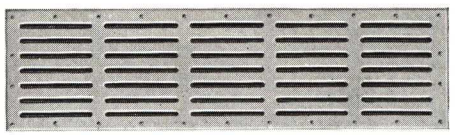


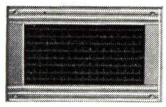
Induction Effect Slotted Outlet

SPECIFICATIONS

Type 35C1 slotted outlets are die-formed of galvaneal steel or Allegheny metal, unpainted. The former usually is finished on the job to harmonize with surroundings, the latter being brush finished. Outlets are available in three-slot widths: ⅛", ¼", ½". Countersunk punched holes along edge provide for attaching to ducts.

Snap action dampers of steel, felt covered, are available in ⅛" and ¼" slotted outlet sizes. If used as option, they must be specified so that handle opening may be provided in face.





Comparison of Size of 35C1 (left) and 35C5 Outlets for Same Capacity

TYPE 35C5 ADJUSTABLE OUTLETS

This type of conditioned air outlet fills a long felt need for outlets that could be adjusted at the installation to correct unforeseen distribution obstacles. They are usable on ducts from either unitary or central station conditioning equipment and are also provided on certain pieces of Carrier conditioning units, (see page 6).

In a formed steel frame of the outlet are located two sets of semi-streamline vanes which are an integral part of the Type 35C5 outlet. The rear set of these individually adjustable vanes is vertical and regulates the longitudinal distribution of the air. The front set of vanes are horizontal and is divided into groups, each group controlling the air delivery in the vertical plane. The rear vanes, individually adjustable, may be used to decrease the area of opening by throttling the air flow and raising the resistance of the outlet as a whole.

Type 35C5 outlets are particularly applicable to conditions where large air capacity, long blows and moderate temperature difference between air stream and room are required. They are available in either prime finish, or stainless steel.

A wide range of outlet velocities may be used up to approximately 2000 ft. per minute. The adjustable vanes in the outlet give a wider range of location for the outlet with respect to the ceiling than any other type. Since these outlets have less induction effect than Type 35C1 (slotted) outlets, they are frequently more applicable to long narrow rooms supplied with air from one end.

SPECIFICATIONS

Frame. Of auto-body steel with brass pivots with punched holes for attachment to duct work.

Vanes in Outlet. Chrome plated border, stainless steel louvres, semi-streamlined to reduce friction and decrease noise. Rear vertical vanes, individually adjustable on friction-tight pivots. Front horizontal vanes divided into groups with "gang" controls which may be adjusted on friction tight pivots. Two keys for adjusting vanes furnished with each shipment.

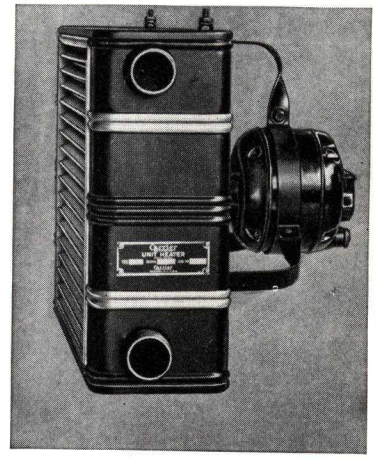
TYPE 46E KROY UNIT HEATERS

USES—These units meet a wide range of conditions: small spaces with comparatively small heat losses; large spaces with heat losses concentrated around walls; for providing sufficient heat to prevent sprinkler freezing; elimination of process moisture to prevent drippage; large rooms subdivided into smaller spaces.

DESCRIPTION—This unit, in decorative black lacquer, aluminum trimmed, is designed for suspension mounting and is available in fifteen sizes ranging in capacity from 21,000 to 255,500 B.t.u. per hour.

Capacity varies with temperature of air entering heating coil. This must be known before calculating heat requirements and size of unit. Steam pressure at unit rather than at boiler or other source, is used for equipment selection. Control thermostats are available.

Two general locations for units are (a) along exposed walls, discharging parallel to wall; toward room center to meet roof losses; and (b) in center of room blowing toward exposed walls. It is advisable to place units near shipping doors or other points of large air infiltration. With no air flow obstructions, Kroy units will deliver up to 50 to 60 feet from the unit, depending on fan speed. (Additional data in Bulletin 46E.)



SPECIFICATIONS

Coils

Aerofin tubing with helically wound fins, tested 1,000 lbs. hydrostatic pressure, guaranteed any pressure (steam or hot water) up to 200 lbs. gauge.

Fan

Propelled type — 12", 16", 22" diameter

Motor

Size, 1/50 hp. to 1/3 hp.

CAPACITIES AND DIMENSIONS

Unit No.	R.p.m.	c.f.m.	B.t.u.	Dimensions, Inches Length	Height	Depth
46E11	1725	970	32,000	15¾	13½	14⅞
46E12	1725	706	42,600	15¾	13½	14⅞
46E13	1725	912	47,800	15¾	13½	14⅞
46E21	1750	1554	65,000	24⅛	17¾	16⅜
46E22	1750	1900	81,000	24⅛	17¾	16⅜
46E31	1750	1541	96,000	24⅛	17¾	16⅜
46E32	1750	1795	110,000	24⅛	17¾	16⅜
46E41	1750	1510	120,000	24⅛	17¾	16⅜
46E42	1750	1685	130,000	24⅛	17¾	16⅜
46E51	1160	2900	148,000	28⅝	28¾	18⅞
46E52	1160	3400	167,200	28⅝	28¾	18⅞
46E61	1160	2830	190,000	28⅝	28¾	18⅞
46E62	1160	3330	210,000	28⅝	28¾	18⅞
46E71	1160	2800	235,000	28⅝	28¾	18⅞
46E72	1160	3180	255,500	28⅝	28¾	18⅞

Bulletin 46E1 gives complete ratings, including those for lower speeds.

TYPES 46P, 46Q, 46R HEAT DIFFUSING UNITS

DESCRIPTION—Thermostatically controlled thermadjust feature results in heat output balanced against requirements, economical fuel consumption results from minimizing the over-heating of upper spaces, more constant demand on steam boiler.

Units are available with a large variety of directional outlets providing even and zoned distribution. Units are well adapted for outside air connection, as required.

OPERATION—Floor mounted, these units take return air from floor level through heater coils, or through front of unit by-passing heater coils. The fan forces the heated air out through distribution outlets horizontally for maximum distribution over the working zone. Type 46Q are floor mounted; the 46P also vertical but suspended; the 46R horizontal suspended.

CAPACITIES—BELT DRIVE UNITS

UNIT SIZE	Fan Speed R.P.M.	C.F.M. At Final Temp.	Basic B.T.U. @ 21lbs. Steam 60° Ent. Air	UNIT SIZE	Fan Speed R.P.M.	C.F.M. At Final Temp.	Basic B.T.U. @ 21lbs. Steam 60° Ent. Air
46Q-20	1100	3400	130000	46Q-64	885	7400	435000
46P-20	940	2950	120000	46P-64	740	6200	380000
46R-20	820	2600	110000	46R-64	670	5600	350000
46Q-22	1100	3000	175000	46Q-66	885	7400	470000
46P-22	940	2550	148000	46P-66	740	6150	410000
46R-22	820	2250	135000	46R-66	670	5600	385000
46Q-24	1100	3200	190000	46Q-70	845	10880	400000
46P-24	940	2750	167000	46P-70	740	9500	368000
46R-24	820	2400	150000	46R-70	600	7650	330000
46Q-26	1100	3300	215000	46Q-72	845	10050	600000
46P-26	940	2830	192000	46P-72	740	8800	540000
46R-26	820	2500	173000	46R-72	600	7120	450000
46Q-30	1100	5100	197000	46Q-74	845	10320	650000
46P-30	940	4350	180000	46P-74	740	9030	587000
46R-30	820	3800	165000	46R-74	600	7330	485000
46Q-32	1100	4600	250000	46Q-76	845	10690	688000
46P-32	940	3920	220000	46P-76	740	9200	620000
46R-32	820	3440	200000	46R-76	600	7400	520000
46Q-34	1100	4800	285000	46Q-90	980	13650	510000
46P-34	940	4100	254000	46P-90	845	11800	470000
46R-34	820	3600	227000	46R-90	740	10360	430000
46Q-36	1100	4950	320000	46Q-92	980	12800	760000
46P-36	940	4200	283000	46P-92	845	11200	685000
46R-36	820	3700	254000	46R-92	740	9680	622000
46Q-60	885	7550	275000	46Q-94	980	13350	840000
46P-60	740	6260	248000	46P-94	845	11520	750000
46R-60	670	5650	235000	46R-94	740	10100	680000
46Q-62	885	7100	390000	46Q-96	980	13700	900000
46P-62	740	5950	340000	46P-96	845	11830	800000
46R-62	670	5400	316000	46R-96	740	10400	725000

Available in belt or direct drive types with or without by-pass features.

DIMENSIONS, INCHES

Unit No.	Length	Height	Depth
46Q20-22-24-26	46½	109	21
46Q30-32-34-36	66½	109	21
46Q60-62-64-66	59½	109½	28
46Q70-72-74-76	85½	109½	28
46Q90-92-94-96	85½	116	36½

SPECIFICATIONS

Fans

Multi-blade centrifugal, 11¾" and 16" diameter, two or three fans per unit.

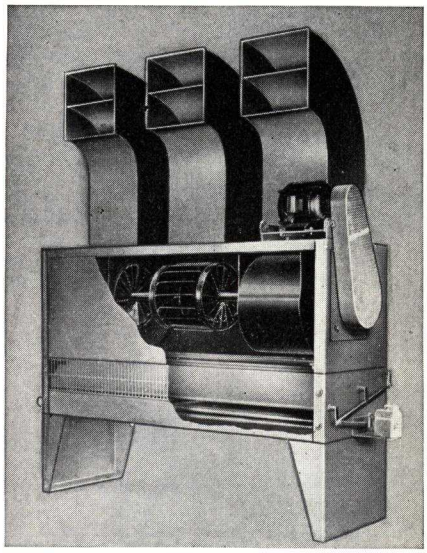
Motor

¼ to 5 hp., 110, 220, 440, 550 V.A.C., or D.C. 690 to 1750 r.p.m.

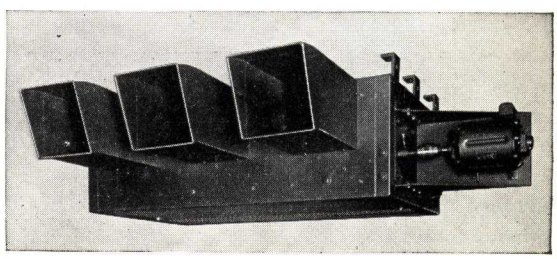
Coils

Aerofin tubing with helically wound fins, tested 1,000 lbs. hydrostatic pressure, guaranteed any pressure (steam or hot water) up to 200 lbs. gauge.

Complete data on units in Bulletin "Carrier Heat Diffusing Units".



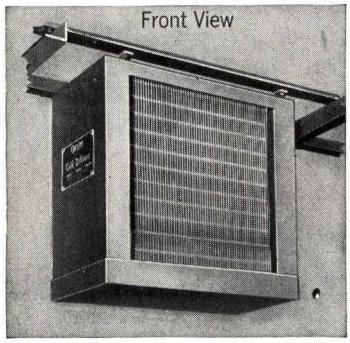
Type 46Q—Belt Drive



Type 46R—Direct Drive

Unitary equipment for product conditioning, cooling and storage, at temperatures below comfort range, and at refrigerant temperatures, both above and below freezing. This equipment provides positive air circulation; adequate and varied means of air distribution, surface cooling (or with spray); automatic control of room conditions; high relative humidities if desired; automatic control of defrosting when room is above 33°; adaptation to variety of refrigerants; flexibility to meet variety of storage room layouts.

TYPE 1400 COLD DIFFUSERS



USES—Primarily for small commercial applications where temperature is maintained above freezing.

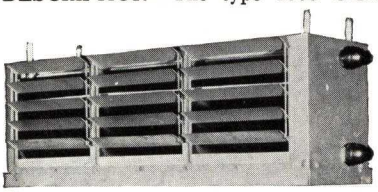
CAPACITIES—Seven sizes of units ranging from 0.1 to 0.75 tons are available for Methyl Chloride, Freon, or cold water as refrigerants.

DESCRIPTION—Cooling coil of copper tubing with aluminum fins, enclosed in galvaneal casing, green lacquered. Propeller fan draws room air over coal and discharges horizontally into conditioned space. Light weight. Easily installed. Electrical, refrigeration and drain are only connections required.

TYPE 1800 COLD DIFFUSERS

CAPACITIES—Range in capacity from .2 to 1.5 tons, a range in Ammonia or Brine, not available with Type 1400 units.

DESCRIPTION—The type 1800 Carrier Cold Diffusers are horizontal suspended models which supplement the Type 1400 units, being available for ammonia or brine. Adjustable deflectors, control velocity and direction. Prime surface steel galvanized coils, near ceiling outlet removes warm air, not through product.

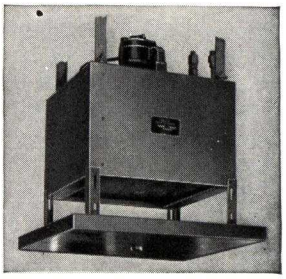


TYPE 15K COLD DIFFUSERS

USES—They are frequently used in fur storage vaults, food or fruit storage, florist shops or other similar cooling requirements.

DESCRIPTION—Similar to the Type 1400, these units discharge air downward with pan outlets. Coils are available for Methyl Chloride, Freon, Brine, or Ammonia refrigerant as required.

The coils have from three to seven circuits in parallel depending on refrigerant and requirements.

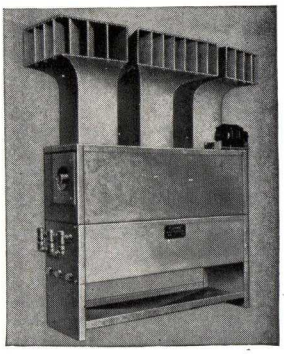


TYPE 15Q COLD DIFFUSERS

DESCRIPTION—Floor-mounted surface type cooling units having prime and fin surface coils.

OPERATION—Air is drawn in through the base and forced out vertically by multiblade centrifugal fans through top outlet or ducts. Four sizes available with coils for Freon, Methyl Chloride, Ammonia, or Brine. Capacities range from one to thirty tons of refrigeration per unit.

Made in sections, the units are easily handled, and all but the 15Q9 model may be easily converted from top to side discharge. Multiple outlets provide directional air diffusion. Humidity control obtained by correct selection of air quantity refrigerant temperature.



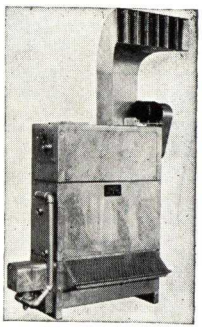
TYPE 15T COLD DIFFUSERS

USES—Recommended for storage rooms to be held near or below freezing (but above 10° F.) and where latent heat loads, such as with fresh meats, are heavy. Germicidal action inhibits mold growth and disagreeable odors.

DESCRIPTION—This unit offers a means of obtaining high air purity and low operating temperatures without loss of time for defrosting. The salt brine spray has germicidal action and prevents frosting.

These units have wide application in spaces and for temporary storage of products where minute particles of brine are unobjectionable. In certain spaces such as brewery fermenting rooms, the 15T units may be used with sweet water spray instead of brine, thus serving as a combined air washer into conditioned space. Light weight.

In the five sizes, floor mounted of Type 15T, the refrigerant may be Freon, Methyl Chloride, Ammonia or Brine. The unit is formed and welded in sections, affording flexibility of installation. The outlets may be readily converted from top discharge to side discharge. They are low velocity type, the multiple outlets affording uniform air distribution. The coils are finned type with centrifugal headers for Freon or Methyl Chloride, surge drum and float valve controls for Ammonia.



DATA ON COLD DIFFUSERS

Type Unit	No. of Sizes Available	Suspension	Type of Fans	No. of Fans	Range of Cfm	Fan Motor Hp.	Range of Capacity Tons	Types of Refrigerant	Type Coil	Coil Material	DIMENSIONS OVERALL INCHES Length	Depth	Height	Weight
1400	7	Ceiling	Disc	1	200-1100	1/50-1/15	0.1-0.75	Meth. Cl. Freon	Finned	Fin-Aluminum Tube-Copper	15⅝"-22¼"	21"-23"	15"-22¾"	105-175
1800	3	Ceiling	Disc	1, 2, & 3	500-3800	1/15 Three 1/6	0.2-1.5	Brine Ammonia	Prime	Galv. Steel	$24\frac{3}{16}$"-$62\frac{11}{16}$"	29¾"	$21\frac{1}{16}$"	410-1030
15K	2	Ceiling	Disc	1	700-3000	1/15-1/3	0.5-3.5	Meth. Cl. Freon	Finned	Fin-Aluminum Tube-Copper	$26\frac{3}{16}$"-$34\frac{5}{16}$"	$26\frac{13}{16}$"-$30\frac{3}{16}$"	$30\frac{5}{8}$"-$35\frac{3}{16}$"	260-455
								Ammonia	Finned	Fin-Aluminum Tube-Aluminum				
								Brine	Finned	Fin-Aluminum Tube-Copper				
15Q Prime	4	Floor Mounted	Centrifugal	1, 2, & 3	1000-12000	¼ - 5	1 - 20	Meth. Cl. Freon	Prime	Galv. Steel	27¼"-85½"	21"-28"	105½"-112½"	1350-3800
								Ammonia Brine	Prime	Galv. Steel				
15Q Finned	4	Floor Mounted	Centrifugal	1, 2, & 3	1200-12000	¼ - 3	1 - 30	Meth. Cl. Freon	Finned	Fin-Aluminum Tube-Copper	27¼"-85½"	21"-28"	105½"-112½"	1050-3315
								Ammonia Brine	Finned	Galv. Steel				
15T Brine Spray	5	Floor Mounted	Centrifugal	1, 2, & 3	700-11000	¼ - 5	1 - 35	Meth. Cl. Freon	Finned	Galv. Steel	39"-96"	21"-36½"	70"-84"	1250-4700
								Ammonia Brine	Finned	Galv. Steel				

REFRIGERATING MACHINES

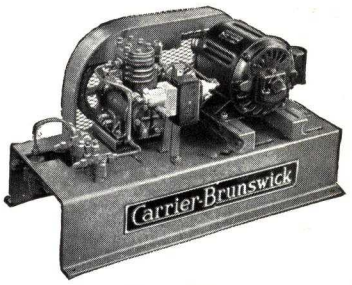
TYPES 7H1 TO 7F2 (AIR COOLED)

DATA ON FREON MACHINES

These units are available in six sizes using either Freon or Methyl Chloride as the refrigerant. Primarily used for food refrigeration installations, either singly or in multiple. Particularly adaptable when water for condensing is not economically available.

	7H1-14	7H1-13	7H1-12	7F2-34	7F2-10	7F2-15
Motor, hp.	¼	1/3	½	¾	1	1½
Std. speed r.p.m.	470	610	800	285	320	470
Nominal Cap.*						
1000 Btu/Hr.	2.18	2.83	3.79	4.60	5.48	8.51
Tons	.182	.236	.308	.384	.456	.71
Connections, Ins.						
O. D. Suction	⅜	½	½	⅝	⅝	¾
Discharge	¼	¼	¼	⅜	⅜	⅜
Dimensions, Ins.						
Length	23½	29	29	34	34	34
Width	15½	22⅞	22¾	22 13/16	22 13/16	22 13/16
Height	15⅜	20¼	23⅛	25 1/16	25 1/16	29½
Net Weight, lb.	155	240	265	335	355	375

*90° Ambient Air Temperature, 20° Suction



Type 7H1

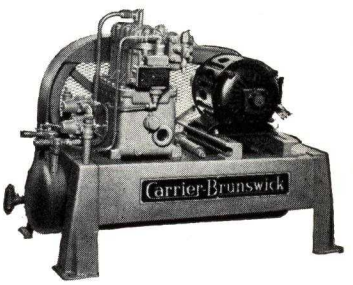
TYPES 7H1 TO 7F4 (WATER OR EVAPORATIVE CONDENSERS)

DATA ON FREON MACHINES

Seven sizes of this unit are available for use with the water cooled condenser, six for evaporative condenser (see page 14). Refrigerants used are Freon or Methyl Chloride. Made with two or three cylinders, the smaller sizes are commonly used in commercial refrigeration installations, the larger sizes may be used for air conditioning.

Unit No.	x7H1-13	7H1-12	7F2-34	7F2-10	7F3-15	7F3-20	7F4-30
Motor Hp.	1/3	½	¾	1	1½	2	3
Std. Speed rpm.	510	740	285	355	285	390	350
Nom. Cap.*							
1000 Btu/Hr.	4.96	7.22	9.47	11.80	17.98	24.60	33.10
Tons	.412	.601	.79	.974	1.49	2.05	2.7
Connections, Ins.							
Suction—W.C.	½″	½″	⅝″	⅞″	⅞″	⅞″	2¾″
Suction—E.C.		½″	⅝″	⅞″	⅞″	⅞″	2¾″
Liquid—W.C.	¼″	¼″	⅜″	⅜″	½″	½″	½″
Discharge—E.C.		½″	⅝″	⅝″	⅝″	¾″	¾″
Water—W.C.	⅜″	⅜″	½″	½ FPT	⅝″	½ FPT	¾ FPT
Dimensions, Ins.							
Length—W.C.	34¾″	34¾″	36″	36″	43¼″	43¼″	43⅜″
Length—E.C.		29″	34″	34″	40½″	40½″	40½″
Width—W.C.	17¼″	17¼″	17⅝″	17⅝″	22¼″	22¼″	23⅛″
Width—E.C.		15⅞″	17⅝″	17⅝″	22¼″	22¼″	23⅛″
Height—W.C.	18¼″	18¼″	22½″	22½″	31½″	31½″	32″
Height—E.C.		18¼″	22½″	22½″	31¼″	31¼″	32″
Net Weight—W.C.	240	260	310	330	465	475	585
Net Weight—E.C.		190	240	255	390	455	580

x—Available only in water cooled type.
*—Suction 40° F., condensing 98° F.



Type 7F3

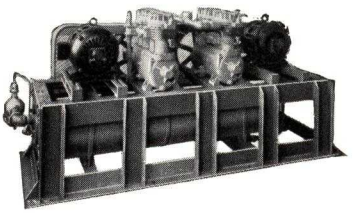
TYPES 7F5, 7H5, 7F6, 7H6, 7F66, 7H66 (WATER OR EVAPORATIVE CONDENSERS)

DATA ON FREON MACHINES

These units, water or evaporative condenser cooled, and using either Methyl Chloride or Freon as refrigerant, represent machines usable for medium small refrigeration loads, including air conditioning service. The Type 7F66 series duplex machine consists of two compressors and motors on a single base, each of which may be operated independently.

	7F5-50	7H5-75	7F6-100	7H6-150	7F66-100-100	7H66-150-150
Motor Hp.	5	7½	10	15	Two-10	Two-15
Std. Speed R.P.M.	450	600	450	600	450	600
Nom. Capacity*						
1000 Btu/Hr.	68.0	90.6	136.0	181	272	362
Tons	5.66	7.56	11.64	15.05	22.64	30.18
Connections, Ins.						
Suction, W.C.	1⅜	1⅝	2⅛	2⅝	3⅛	3⅛
Liquid, E.C.	1⅜	1⅝	2⅛	2⅝	3⅛	3⅛
Water in W.C.	1 F.P.T.	1¼ F.P.T.	1¼ F.P.T.	1¼ F.P.T.	2 F.P.T.	2 F.P.T.
Water out W.C.	1 M.P.T.	1¼ M.P.T.	1¼ F.P.T	1½ F.P.T.	2 F.P.T.	2 F.P.T.
Dimensions, Ins.						
Length W.C.	60½	59¾	61¼	63¾	105	105
Length E.C.	50	50	50	50	95¾	95¾
Width W.C.	30⅛	30	37⅜	37⅜	38¼	38¼
Width E.C.	26¼	26¼	35½	35½	33½	32⅞
Height W.C.	41¾	44 7/16	41¾	44 7/16	46 11/16	55
Height E.C.	30¾	33½	30¾	33½	32¾	41
Net Weight W.C.	1175	1265	1840	1895	2650	3500
Net Weight E.C.	1030	1120	1435	1535		3100

*Suction 40° F., Condensing 98° F.



Type 7F5

Type 7F66

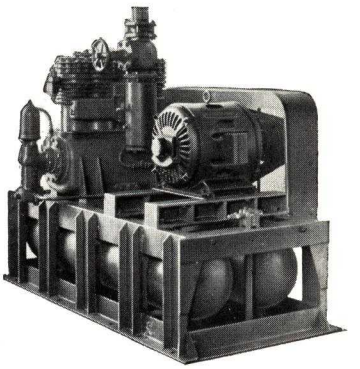
TYPES 7G6 AND 7G8—(WATER OR EVAPORATIVE CONDENSERS)

DATA ON FREON MACHINES

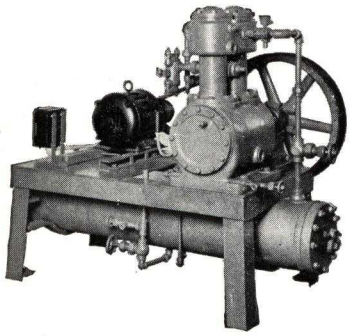
These units are used for medium sized commercial or industrial refrigeration or for air conditioning installations. Freon or Methyl Chloride refrigerant may be used. More than one unit may be interconnected on a common suction for use on the same refrigeration load.

Unit No.	7G6-200		7G8-300		7G8-400	
	W.C.	E.C.	W.C.	E.C.	W.C.	E.C.
Motor Hp.	20	20	30	30	40	40
Standard Speed RPM	800	800	450	450	500	500
Nom. Capacity*						
1000 Btu/Hr.	229	229	489	489	543	543
Tons	19	19	40.7	40.7	45	45
Connections, Ins.						
Suction, W.C.	2⅝ O.D.	2⅝ O.D.	3⅝	3⅝	3⅝	3⅝
Liquid, W.C.	1⅛		1⅝		2⅝	2⅝
Liquid, Discharge, E.C.		2⅛ O.D.	1⅝	2⅝	1⅝	2⅝
Water In, W.C.	1½ F.P.T.		2½ F.P.T.		2½ F.P.T.	
Water Out, W.C.	1½ F.P.T.		2½ F.P.T.		2½ F.P.T.	
Dimensions, Ins.						
Length, W.C.	63¾	50	102⅛	80½	102⅛	80½
Width, W.C.	37⅜	35½	58½	58½	58½	58½
Height, W.C.	44½	33½	72⅝	58⅝	72⅝	58⅝
Net Weight, W.C.	1895	1535	5000	3600	5300	3900

*Suction 40° F., Condensing 98° F.



Type 7G8



TYPE 8B REFRIGERATING MACHINES

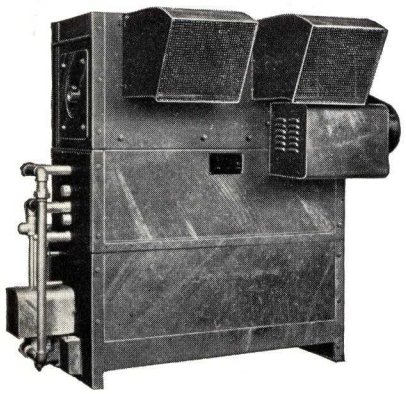
(Ammonia)

These units are designed for small and medium size commercial refrigeration application of all types where Ammonia is the preferred and accepted refrigerant. These units are available either as a self-contained unit with a belt drive from a motor mounted on the same base, or as a bare compressor which is driven by belt, or for direct connection for low speed motors or through gear reduction for high speed motors. These eccentric drive compressors have C.I. oil-bathed bearings of low unit pressure.

DATA ON TYPE 8B SELF CONTAINED UNIT

Unit No.	Cond. Size Inches	ASRE tons	Comp. R.P.M.	Motor HP.	Ship. Wt. Lbs.
8B11	8x63	1.06	500	2	1285
8B12	10x63	2.14	500	5	2100
8B13	12x63	4.57	475	7½	2720
8B14	15x63	7.00	390	15	3780

CARRIER EVAPORATIVE CONDENSERS



Type 9Q Evaporative Condenser

For several years, Carrier Evaporative Condensers have been widely accepted as a means of water and power economy in refrigeration machines. They are essentially air cooled condensers, in which the refrigerant gas is condensed thru the evaporative cooling effect of water sprayed over the coil. They replace water cooled condensers and water cooling tower systems. They are available for air conditioning and refrigeration plants of one to forty tons capacity. In existing installations this is an effective means of reducing operating costs through practical elimination of water costs. For new work, an economical installation of refrigeration equipment results.

Utilizing as little as 5% of the amount of water required for water cooled condensers, these units are particularly applicable in locations where water supply is limited in quantity or pressure, or is expensive.

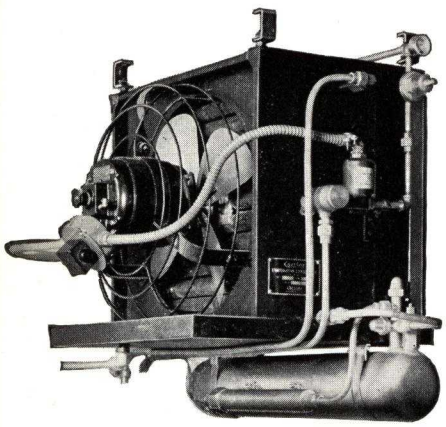
Operating advantages are: (compared with water-cooled units) 90 to 95% less water; saving in power; increased compressor capacity (ability in some cases to use next smaller size compressor); makes possible larger installations in water-scarce localities; practical elimination of pumping cost (compared with cooling tower), lower operating costs thru effective use of outside wet bulb temperatures.

THE TYPE 9Q EVAPORATIVE CONDENSER, floor mounted is available in four nominal capacity sizes: 10, 20, 30, 40 tons. The units may be connected in multiple for greater capacities for operation with systems using Methyl Chloride, Freon or Ammonia as refrigerants.

The units are of sectionalized construction, which facilitates handling and erection. It provides an assembly which can be easily changed to meet various installation requirements. The units are designed to be installed out-of-doors without additional housing. When installed indoors, a duct connection leads to the outside for discharge of heat and moisture-laden air.

SPECIFICATIONS

Unit No.	Appox. refrig. cap. tons	Dimensions, Inches			Oper. wt. lbs.	Fan Motor hp.	Pump motor, hp. 60 Cyc.	Water consp. g.p.m.	Refrig. Connect., Ins.	
		Length	Width	Height					Gas	Liquid
9Q2	10	58¾	28	63½	2000	1	1/6	0.6	2⅛	1⅛
9Q6	20	73⅝	28	77½	3000	1½	1/6	1.1	2⅛	1⅛
9Q7	30	99⅜	28	77½	3650	2	1/6	1.7	2⅛	1⅛
9Q9	40	101⅜	36½	77½	4350	3	1/6	2.1	3⅛	1⅝



Type 9P Evaporative Condenser

THE TYPE 9P EVAPORATIVE CONDENSERS are economical for the smaller sizes of Methyl Chloride, Freon, or Ammonia compressors as the 9Q type is for the larger range. They serve primarily as a substitute for the water-cooled or air-cooled types of condensers. Advantages are: little water required in condensing, low power, high capacities.

Units are available with one, or three circuit coils, depending on use with single or multiple compressors.

Installation—Suspension mounted. No floor space required. Takes up little head room. Simple to install, requiring only water supply and drain. Furnished with refrigerant gas inlet, liquid outlet, electrical connection to fan motor, air intake duct and discharge, water supply and drain connections. Duct connection may be made to the outside.

SPECIFICATIONS

Unit No.	Capacity Tons	Refrigerant*	Motor hp.	Length	Height	Width	Shipping wt., lbs.
9P2—104	1	M-F	1/8	24¾	22 11/16	22	270
9P2—214	1	M-F	1/8	24¾	22 11/16	22	270
9P2—224	1	A	1/8	24¾	22 11/16	22	270
9P3—104	2	M-F	1/8	27¾	25 15/16	27¼	360
9P3—214	2	M-F	1/8	27¾	25 15/16	27¼	360
9P3—224	2	A	1/8	27¾	25 15/16	27¼	360
9P3—304	2	A	1/8	27¾	25 15/16	27¼	360

*Refrigerant: M—Methyl Chloride. S—Sulphur dioxide. A—Ammonia.

CARRIER CENTRIFUGAL REFRIGERATING MACHINES

USES—The Carrier Centrifugal Refrigeration Machines have had very widespread use for many years in providing large refrigerating capacities for industrial process work as well as for commercial air conditioning installations.

DESCRIPTION—The machines are available in various sizes, ranging in capacity from 50 to 850 tons, air conditioning rating. The refrigerant is Carrene (monofluorotrichloromethane), non-toxic, non-explosive, non-inflammable, highly efficient. In all sizes, the machines are compact self contained units, comprising evaporator, centrifugal multi-stage compressor, and condenser on a single foundation. They are used to furnish chilled brine (salt or other solution or fresh water) to the process equipment or the air conditioning apparatus, for direct cooling of beverages or condensation of gases. Machines are built in various stages or stage combinations as required for special applications. For process work, temperatures as low as 100°F. are attained with these machines but for air conditioning work the spray water is not usually taken below 40° F. above zero.

The machines may be located nearby or remotely from the point of heat absorption, consequently one machine or group of machines may serve the entire requirements for a widespread building or industrial load.

The eleven sizes with varying load conditions being properly cared for by each size makes the machine particularly desirable under a wide range of refrigeration requirements.

The compressors are multi-stage centrifugal. The rotor is statically and dynamically balanced and the impellers are lead coated to preserve this balance. The complete oiling system with pump is an integral part of the compressor with the oil cooler located externally.

Carrier Centrifugal Refrigeration Machine advantages are—

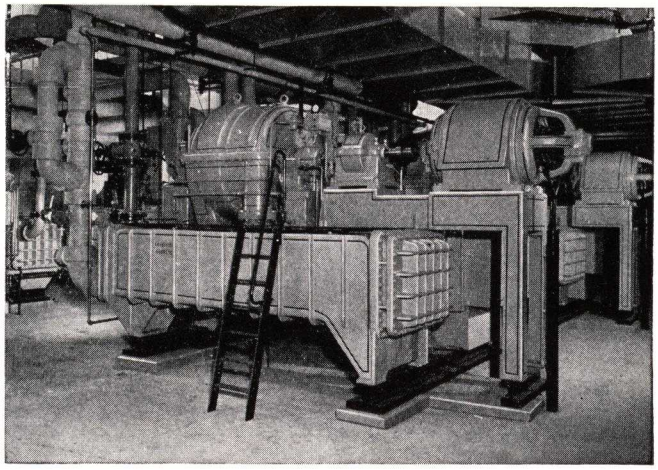
It permits wide selectivity in type of drive as: Synchronous motor for constant speed and power factor correction; Induction motor for constant speed and low initial cost but not permitting greatest economy of operation; Slip-ring motor for variable speed, manual or automatic control; very efficient at partial loads in combination with centrifugal; Diesel or gas engine for variable or constant speed, practical particularly where electric rates are high and low cost gas is available; Steam turbine for variable speed, manually or automatically controlled; its ideal designed speed is well suited to the speed of the Carrier machine, combining low cost with the maximum of economy and flexibility . . . clean steam, free from contaminating oil. It effects unusual heat balance, obtaining power for refrigeration as a by-product.

OPERATION—The Carrier Centrifugal Machine is easy to operate; it can be started simply; it picks up load almost instantly; it responds immediately to changes in load; it is a self-contained compact machine, with all gauges and thermometers within easy reach; it is inherently suited to automatic regulation, complete or partial; it has non-overloading characteristics.

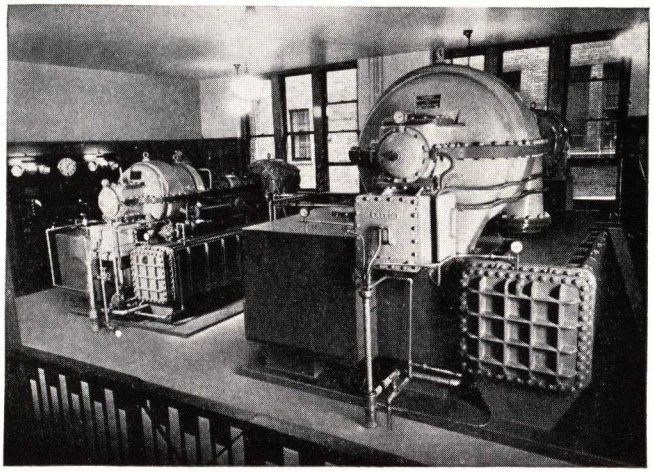
The Carrier Centrifugal Machine is easy to maintain; There are few moving parts and they are rotating, free from vibration and shock, light in weight, simple in construction; all bearings and parts are easily accessible; no pump-down preceding maintenance work is required except rarely; brass tubes less subject to corrosion pitting and fouling than steel tubes; oil does not come in contact with the refrigerant consequently the cleaning of heat transfer surfaces is simplified.

The machine and its refrigerant are safe. All moving parts are enclosed. Rotor speeds are conservative and below critical. For usual temperature conditions both condenser and cooler operate either under a vacuum or slightly above atmospheric pressure.

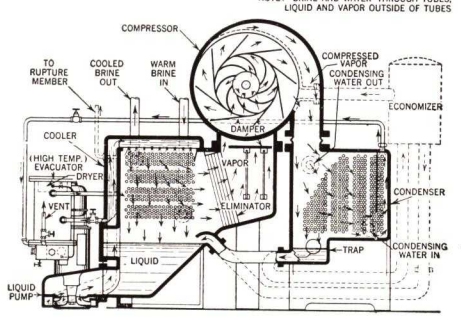
The Carrier Centrifugal Machine is inherently resistant to wear, and its consequences are small, not reducing its efficiency; It has inherent characteristic of adjusting itself to fractional load without attention, it is a constant temperature machine, as distinguished from the reciprocating which is a constant volume machine. The refrigerant has the highest efficiency of any practically available. The machine occupies an exceptionally small amount of floor space per ton of refrigeration, compact in all sizes.



Battery of Centrifugals for Office Building



Centrifugal Refrigeration for Processing



DIAGRAMMATIC ARRANGEMENT

OPERATING CYCLE

"The liquid pump (bottom left) raises the liquid refrigerant to the top of the evaporator. Through the holes in the distributing plate, the refrigerant is sprayed over the cooling coils through which circulates the brine (salt solution or water) to be cooled. The refrigerant absorbs the heat of the brine, thus evaporating. In this vapor state, it is drawn into the compressor where it is compressed (in stages) to the original pressure. Its heat is then removed by the condenser water (city, deep well, or tower water) flowing through the coils. Consequently, the refrigerant vapor becomes a liquid and enters first the return trap, then the evaporator, thus completing the refrigeration cycle."

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PROGRESS

Since that day in 1911 when Willis H. Carrier pronounced his Psychrometic Formulae, thus giving to the world the scientific basis of air conditioning, he and his associates have been constantly engaged in its research, development and applications. From that guidance and cooperation have resulted thousands of installations of Carrier equipment for the benefit of industrial processes and the health and comfort of human beings.

Pioneering in: Centrifugal Refrigeration, dewpoint control, scientific distribution of air, low temperature product conditioning, modern space heating methods, industrial processing systems, standardized unitary systems, Home Weathermaker systems, evaporative condensers and many others, Carrier has not been content to rest on early laurels but continually leads the way with new developments. This brochure is designed to supply information even before calling the nearby Carrier representative who will be glad to cooperate in solving problems in Air Conditioning, Commercial Refrigeration and Heating.

Carrier
Air Conditioning
Refrigeration
Heating

CE 100

Printed in U. S. A.

CLARAGE FAN COMPANY

Manufacturers of Air Handling and Air Conditioning Equipment

MAIN OFFICE AND PLANT

KALAMAZOO, MICHIGAN

Sales Engineering Offices in All Principal Cities (Consult Your Local Telephone Directory)

MULTITHERM CONDITIONING UNITS—968 DIFFERENT EQUIPMENT COMBINATIONS
Designed for Stores, Restaurants, Offices, Small Theatres, Factories, Etc.

These self-contained, cabinet-type units are a satisfactory and economical answer to a vast number of conditioning problems. They can be furnished for cooling and dehumidifying, for heating and humidifying, or for *complete* air conditioning. 968 different sizes and combinations are available—suitable equipment for practically every job. Quiet operation is assured by the use of perfectly balanced fan wheels and noise insulators.

Easily Installed — Taking but small space, a Multitherm can be installed at low cost in any new or old building. It can be suspended from the ceiling, or mounted on a platform or the floor—used with or without ducts.

Fully Automatic—Every unit can be completely regulated by the room thermostat and humidistat—no other attention needed.

For Summer Cooling and Dehumidifying—Units can be fitted to utilize cold well water, refrigerated water, brine or a direct expansion refrigerant.

For Winter Heating and Humidifying — Steam or hot water is required. Any boiler now in service can be used provided capacity is adequate.

Write for Bulletin 107 giving full details.

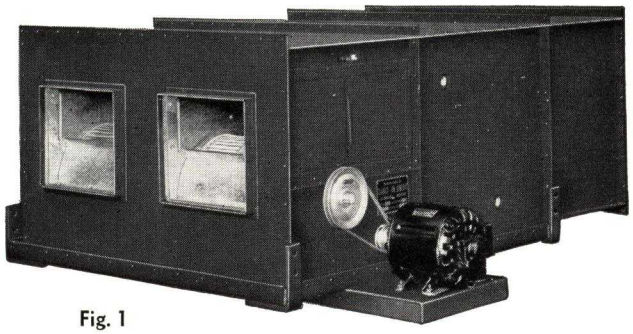


Fig. 1

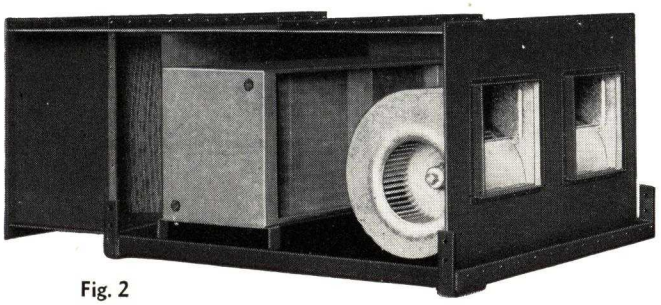
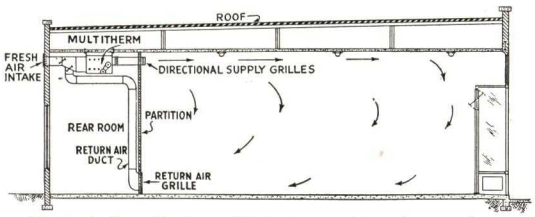


Fig. 2

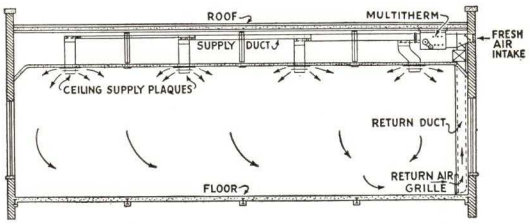
Fig. 1 shows outlet end of two-fan Multitherm Unit. Units can be equipped with Clarage Syncrotherm Control (patented) which controls temperatures by regulating air flow through and around heating coil.

Fig. 2 shows side of cabinet removed, displaying centrifugal fans, cooling coil and filters. Filters can be easily removed and replaced as necessary.

All Multitherm Units are factory tested—performance and construction fully guaranteed.



Typical Installation: Multitherm Unit Located at Ceiling Line in Rear Room of Average Size Store
Conditioned air discharged directly into store space without use of ducts

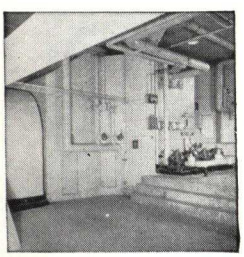


Typical Installation: Multitherm Located in Attic Space Above a Store or Restaurant
Distribution of conditioned air accomplished with one supply duct

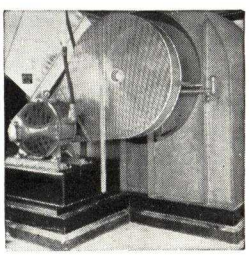
AIR CONDITIONING SYSTEMS, FANS, BLOWERS, AIR WASHERS, UNIT HEATERS, COOLERS, ETC.

Clarage also builds central air-conditioning systems for both comfort and process work, unit air conditioners for applications where very close control is essential, unit coolers for product cooling and refrigeration, unit heaters for industrial and commercial services, various types of fans for ventilation and conditioning, mechanical draft equipment, exhaust fans, pressure and volume blowers.

Complete information furnished upon request. Write for bulletins and engineering data.



Air Conditioning System



Large Ventilating Fan

This trade-mark identifies all Clarage products which are backed by 25 years' experience manufacturing air handling and conditioning equipment, *exclusively.*

Unit Heater

THE COLEMAN LAMP AND STOVE COMPANY

Coleman Gas Floor Furnaces for Natural or Artificial Gas

PHILADELPHIA, PA. CHICAGO, ILL. WICHITA, KAN. LOS ANGELES, CALIF.

COLEMAN NATURAL GAS FLOOR FURNACES

General Information

Coleman Gas Furnaces are made in the factories of THE COLEMAN LAMP AND STOVE COMPANY at Wichita, Kansas, U. S. A.—the center of the biggest natural gas producing area in the United States. The Coleman Company is one of the largest manufacturers of gas pressure devices in the world, with more than 30 years' experience in designing, developing and manufacturing appliances using as fuel the products of oil and gas producing areas.

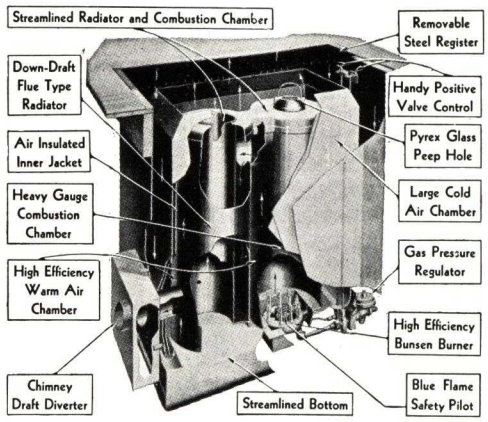
The Coleman Company has an enviable reputation for fair dealing and its products are accepted as a standard of quality the world over.

Coleman Floor Furnaces, like other Coleman Products, are scientifically designed, are made by carefully trained and skilled craftsmen who work in modern factories equipped with the latest types of machinery. All of which insures durable construction, dependable operation, and satisfactory heating service.

Initial and Operating Cost Less

Coleman Floor Furnace equipment may be installed at from one-third to one-half less initial cost than a central heating plant, and for one-story buildings will render equally satisfactory service.

Coleman Floor Furnaces are more economical as to operating fuel cost than central heating plants.



Recommended Uses

Coleman Gas Furnaces are ideal for heating homes, churches, schools, stores and offices. They are designed for continuous as well as intermittent heating; they will not sweat walls, even in humid climates; and will give entire satisfaction where severe winters are the rule rather than the exception.

Latest Features

Removable Steel Register—78% open—permits free flow of air. Light, strong, durable. Handsomely finished in maroon brown.

Air Insulated Inner Jackets—Prevents overheating of cold air passage—insures a free, continuous flow of air into furnace; always-cool outer casing.

Easy to Clean—Steel register and inner jacket are easily removable so the entire furnace can be conveniently and quickly cleaned.

Handy Positive Valve Controls—Located just beneath removable register.

Automatic Thermostatic Heat Control—Furnished extra as ordered.

Automatic Pilot Control—Standard equipment on all models.

Patented Bunsen Type Burner—Equipped with Blue-Flame Pilot—Burns all the gas—no wasted fuel. Quiet operation.

Gas Pressure Regulator—Standard equipment on all models. Insures even gas flow.

Chimney Draft Diverter—Prevents loss of heat by chimney suction. Prevents down-drafts from blowing out burner blaze or pilot light.

Flue Type Radiator—Increases heating surface area, thus increasing heating efficiency. Accelerates outflow of warm air—helps keep it in active circulation.

Streamline Design of Air Chambers—Speeds up air flow and increases heating efficiency.

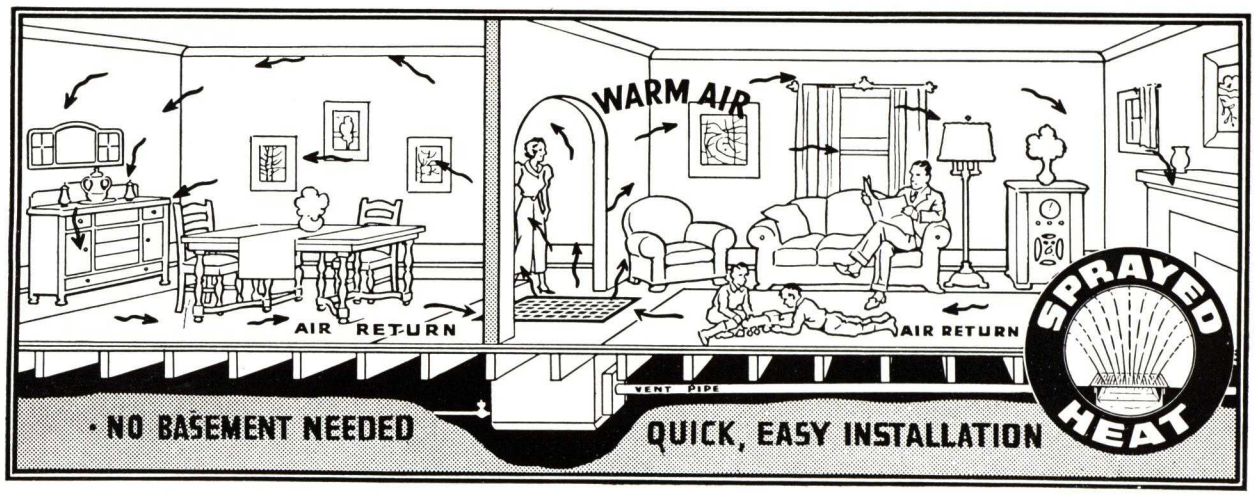
Pyrex Glass Peep Hole—Does not discolor or burn out and fits gastight.

SPECIFICATIONS

	Model No. 9C	Model No. 10C	Model No. 11C	Model No. 12C
Input rating, B.t.u.	20,000	35,000	50,000	70,000
Gas connection at furnace, in.	⅜	⅜	½	½
Gas pipe line size, in.	¾	¾	1	1¼
Vent pipe opening, in.	3	4	4	6
Width and length, in.	14x22	16x30	20x30	24x36
Over-all size of register, in.	16x24	18x32	22x32	26x38
Height, in.	28	35	38	43
Shipping weight, lb.	87	140	178	282

CONSTRUCTION

Combustion chamber and connections (sides)	22 gauge	18 gauge	16 gauge	14 gauge
Combustion chamber (top)	20 gauge	16 gauge	14 gauge	14 gauge
Down-draft, flue-type radiator. (continuously welded and tested gastight)	22 gauge	20 gauge	18 gauge	16 gauge
Insulated inner jacket (double walls)	26 gauge	26 gauge	26 gauge	24 double
Outside casing (lead coated)	24 gauge	24 gauge	24 gauge	22 and 20



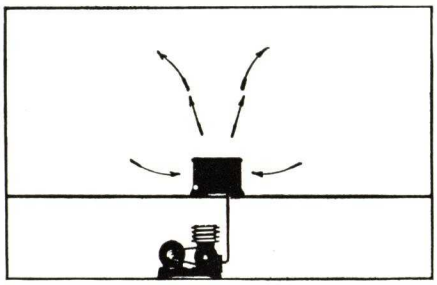
The Coleman Floor Furnace thoroughly warms the air, sprays it to every corner of the room; draws the cold air off the floor, keeps floors warm. No basement needed.

DELCO-FRIGIDAIRE CONDITIONING DIVISION

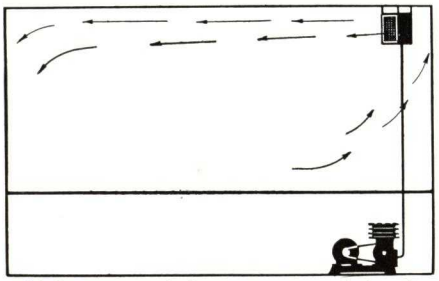
GENERAL MOTORS SALES CORPORATION

DAYTON, OHIO

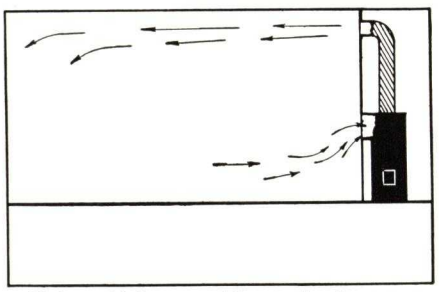
GENERAL TYPES OF DELCO-FRIGIDAIRE AIR CONDITIONING SYSTEMS



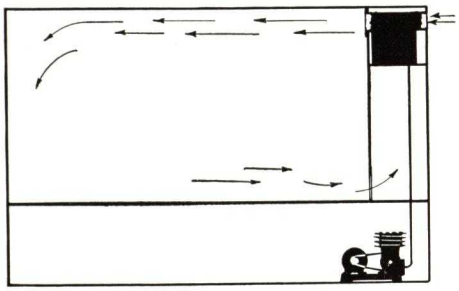
Air conditioning units, floor mounted, either self-contained or with a remote condensing unit for one or for a group of units. Provides high degree of individual control. Good for hotels, private offices.



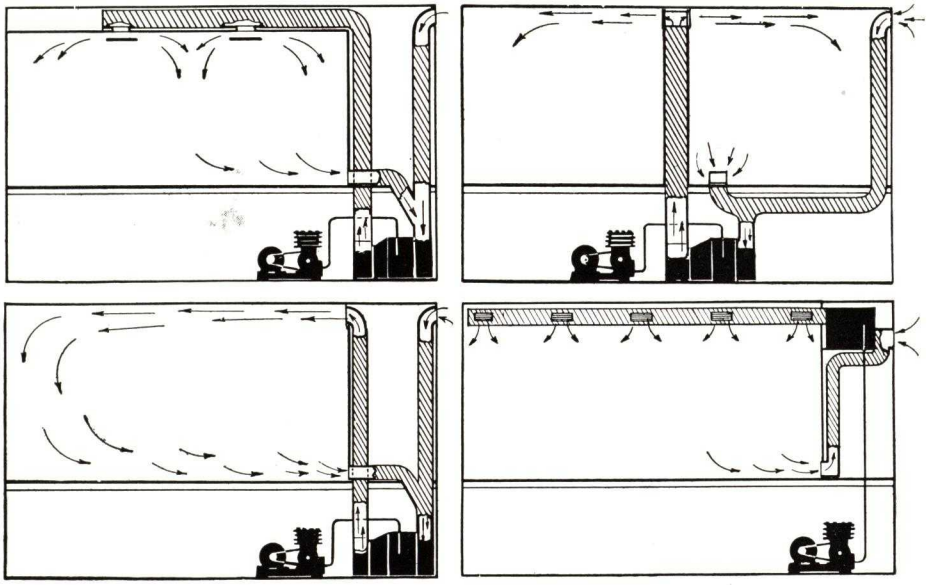
Units suspended or supported in the conditioned space with remote condensing unit. Common application in stores, etc., where outside air requirements are light or otherwise provided for and no space for central plant.



Units which are self-contained or connected to a remote condensing unit to handle medium size applications with minimum of installation expense. Use without duct work or with small amount only.



Units suspended or supported in or outside of conditioned space with remote condensing unit. Finished units available for room use where central point distribution of air is satisfactory.

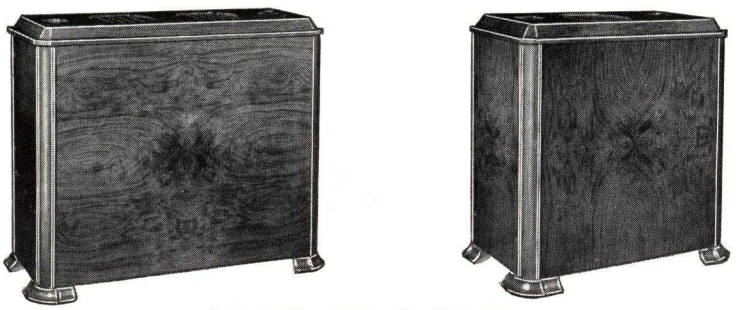


Units with remote condensing units for central plant applications where unit is located outside of conditioned area and air is distributed through supply and return ducts.

The four illustrations above show various general types of central plant installations commonly used.

Practically all classes of equipment in the Delco-Frigidaire line, are available for summer, winter or year round use. These units are also available for indirect water cooling when a source of chilled water is present.

DELCO-FRIGIDAIRE OFFERS A COMPLETE LINE OF PRODUCTS FOR YOUR USE

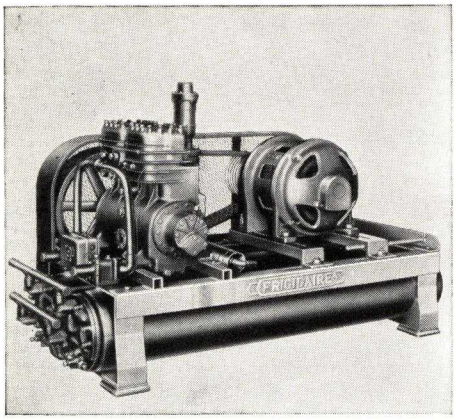


Remote Floor Type Conditioners

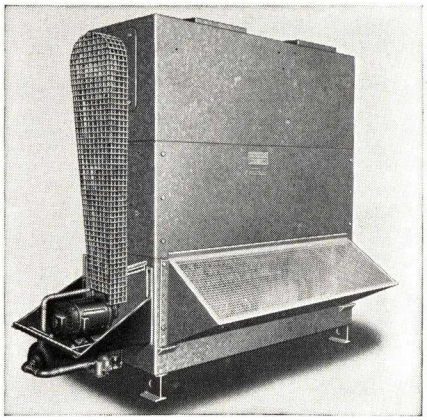
Self Contained Unit

Frigidaire self-contained units (either water or air cooled) in which the mechanism is all enclosed in one cabinet, find their widest application in small private offices and individual rooms in residences—except for a large capacity water cooled model, which has wide application in small business establishments, particularly where the merchant desires equipment having a high resale value.

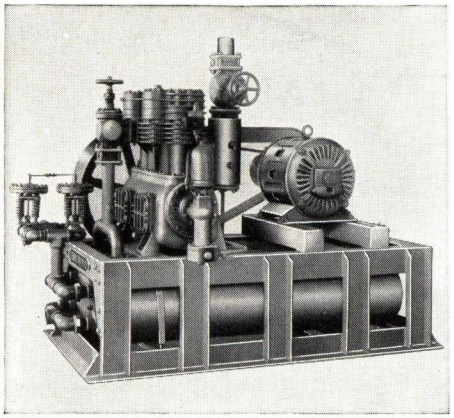
AIR CONDITIONING PRODUCTS



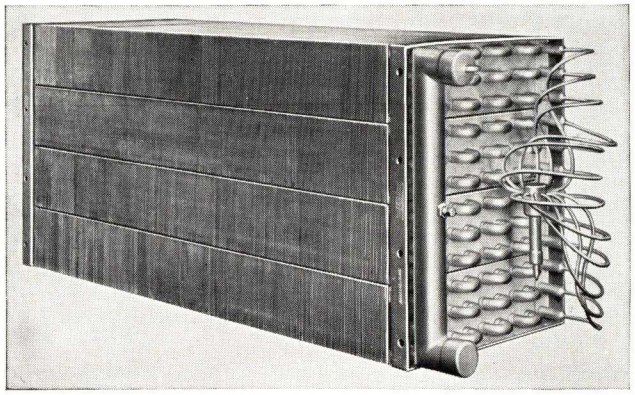
Condensing Units—⅓ to 20 Hp.



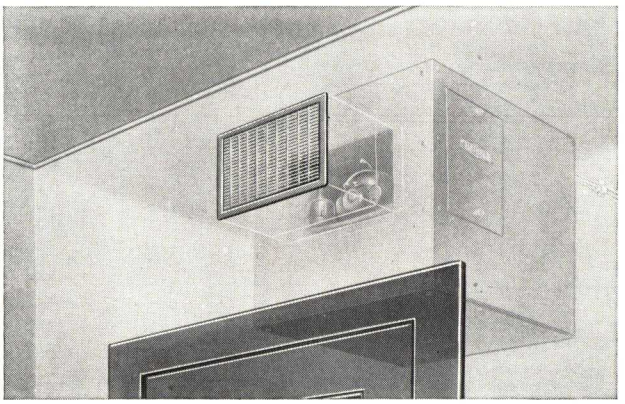
Evaporative Condensers



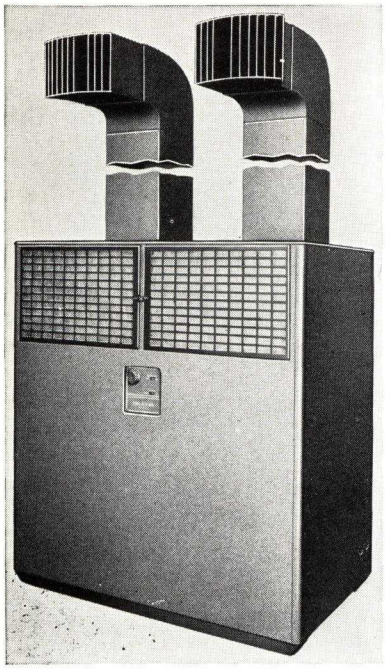
Condensing Units—20 to 50 Hp.



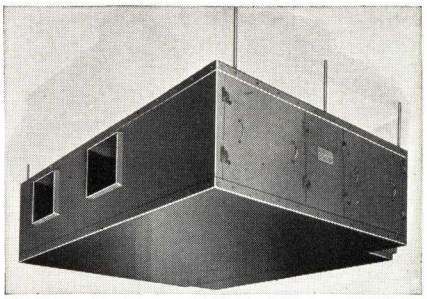
Heating Coils and Evaporators



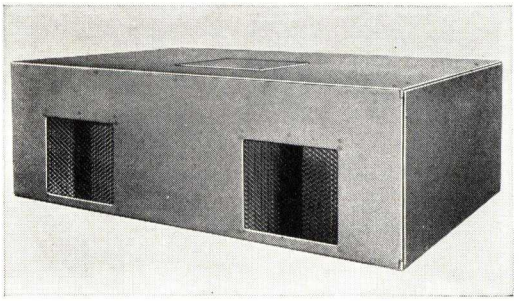
Remote Concealed Air Conditioner



Model SC-301—Large Self-contained Unit Air Conditioner

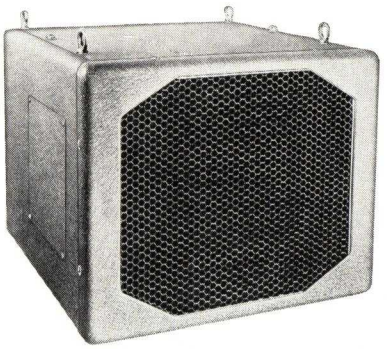


Central Duct System Air Conditioners



Remote Suspended Air Conditioners

(Shown above and below)



Model SC-301—*Refrigerant:* Freon. *Cabinet:* frame of welded steel. *Panels:* of hard fibre, brown finish. *Condensing Units:* two-cylinder, water cooled. *Evaporator:* cross-finned, expansion type. *Controls:* blowers and condensing unit are started and stopped by manual on-off switch. Blower speed is regulated by a manual switch. Thermostat, with convenient indicator for adjustment gives control of room temperature. Foregoing controls located on exterior of cabinet. Condensing unit equipped with high-pressure cut-out and thermal overload protection. Refrigerant controlled by thermostatic expansion valve. Contactor or starter in metal housing furnished for mounting at convenient location. *Ducts:* Each of two vertical stacks consists of a straight section and elbow, permitting the diffusing nozzles to be placed at a maximum height of 10 ft. 6 in. above floor. Height may be reduced by cutting straight section. Nozzles may be directed forward or backward. Nozzles may be removed and the two outlets brought into a common supply duct for distribution to small spaces, with grilles and duct not offering more than ⅛-in. resistance pressure. *Dimensions of Cabinet:* width, 52⅛ in.; depth, 32¾ in.; height, 53 in.; cabinet only. *Capacity:* Approximately 3 tons.

CONDITIONAIRS FOR OIL OR GAS

Heat transfer surface constructed of $\frac{3}{16}$-in. copper bearing welded boiler plate steel. 5-pass combustion gas travel and multi-path air flow insure high efficiency in transfer of heat from combustion to air stream.

Replaceable viscous coated type filters.

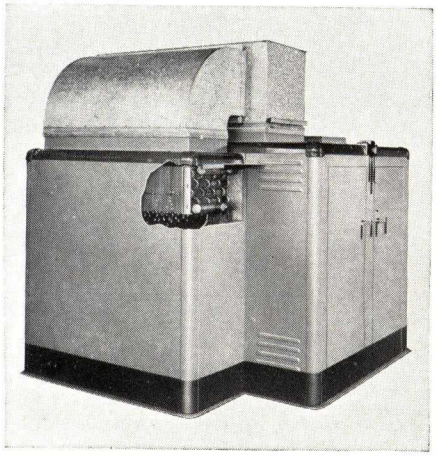
Humidifier—Model DA-1, DA-2—cascade type, mounted under heat exchanger. Model DA-0, cast iron, pan type, mounted on top of heat exchanger. Spray type with full automatic control, standard in the DA-3, optional in the DA-1, DA-2.

High efficiency blower, quiet in operation and flexibly mounted to assure absence of vibration. Blower motor, oil burner and operating controls mounted outside the heating unit, readily accessible inside the doors at front of cabinet (mounted on rear in DA-0).

The famous Delco Rotopower Unit automatic oil burner, completely coordinated with the Conditionair heat transfer unit, provides a "matched performance", resulting in maximum efficiency.

The Delco Rotopower Unit automatic oil burner, built to General Motors standards of precision manufacture, has many exclusive features. Highly efficient, pressure atomizing type with "thin-mix" fuel control.

Standard year around Air Conditioning attachment available as extra equipment on DA-2 Model. Attachment may be fabricated in field for other models. Compact, attractively finished cabinets in Delco green, harmonize with any basement decorative scheme, and increase useful basement space.

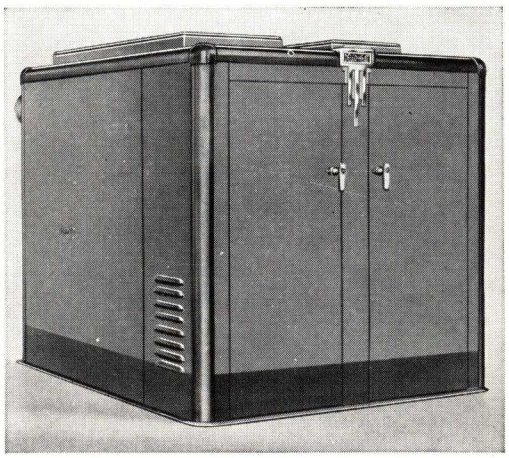


Delco Conditionair with Summer Cooling Attachment

Delco Conditionairs may be used for year round air conditioning through the addition of an evaporator coil assembly to be connected to a Frigidaire Condensing Unit. Where year around Air Conditioning is contemplated either immediately or at some time in the future, the duct system should be designed for proper distribution of the air in summer as well as winter.

Delco Conditionair

There is a sufficient range in sizes to permit selection of the proper size unit for applications ranging from a small six-room house (85,000 B.t.u. heat loss or less) to a large mansion (280,000 B.t.u. heat loss or less).



Model	Hourly B.t.u. Ratings: Max. B.t.u. output at plenum	Hourly B.t.u. Ratings: Net B.t.u. output at registers	Blowers: Units number	Blowers: Fan r.p.m.	Blowers: Max. c.f.m. delivery	Blowers: Filters: Number	Blowers: Filters: Size	Blowers: Motor: Hp.	Blowers: Motor: R.p.m.	Blowers: Motor: Watts	Burner: Model	Burner: Hp.	Burner: R.p.m.	Burner: Watts	Flue outlet size, ins.	Ship. wt., lbs.
DA-0 (Oil)	100,000	*85,000	1	400-660	1600	2	16″	¼SP	1725	210	DRO†	⅛SP	1740	135	8	1162
GA-0 (Gas)	100,000	*85,000	1	400-660	1600	2		¼SP	1725	210	....	....	....	...	8	1028
DA-1 (Oil)	135,000	*115,000	1	400-660	1600	2	x	¼SP	1725	210	DRF†	⅛SP	1740	135	8	1314
GA-1 (Gas)	135,000	*115,000	1	400-660	1600	2		¼SP	1725	210	....	....	....	...	8	1397
DA-2 (Oil)	200,000	*170,000	2	400-660	2400	4	25″	¼SP	1725	250	DF	⅛SP	1740	150	8	1839
GA-2 (Gas)	200,000	*170,000	2	400-660	2400	4		¼SP	1725	250	....	....	....	...	8	1886
DA-3 (Oil)	325,000	*280,000	2	400-580	4000	9	2″	¾TC	1710	780	DF-2	⅙SP	1740	150	10	2878
GA-3 (Gas)	300,000	*255,000	2	400-580	4000	9		¾TC	1710	780	....	....	....	...	10	2678

Maximum A.G.A. Gas input rating, B.t.u. per hour—GA-0—133,000, GA-1—181,000, GA-2—267,000, GA-3—400,000. All GA models available for use with natural, manufactured or mixed gas.

*15% Normal transmission loss. Variable losses based on duct design. SP—Split Phase. TC—Transformer Condenser.

†Rotopower Unit Oil Burner.

FEATURES OF GAS CONDITIONAIRS

Heat transfer surface constructed of $\frac{3}{16}$-in. copper bearing welded boiler plate steel. 5-pass combustion gas travel and multi-path air flow insure high efficiency in transfer of heat from combustion to air stream.

Replaceable viscous coated type filters.

Humidifier—Model GA-1, GA-2—cascade type of aluminum, mounted under heat exchanger. Model GA-0 cast iron, pan type, mounted on top of heat exchanger. Spray type with full automatic control, standard in the GA-3, optional in the GA-1, GA-2.

A long, sweeping, luminous gas flame (self-aspirating, diffusion type) projected horizontally into combustion chamber, is highly efficient in combustion and heat transfer.

Standard year around Air Conditioning attachment available as extra equipment on GA-2 Model. Attachment may be fabricated in field for other models. Compact, attractively finished cabinets in Delco green, harmonize with any basement decorative scheme.

Tested and approved by A.G.A. testing laboratories.

STANDARD AUTOMATIC CONTROL FOR GAS CONDITIONAIR

(1) Heat Accelerated Thermostat—Insures even home temperatures (electric clock type optional extra).

(2) Air Heat Control—Limits operation of the gas burner, preventing higher temperature than desired in heated air chamber.

(3) Fan Control—Inserted in the heated air chamber, starts and stops the blower motor, insures delivery to the rooms of air at proper temperatures.

(4) Summer Switch—Used only in summer for circulating purified, freshened air by operating blowers (optional extra on GA-0 and GA-1).

(5) Pressure Regulator—Maintains constant pressure and gas supply to burners.

(6) Motor Operated Gas Valve—For turning burner on and off at dictate of room thermostat.

(7) Safety Pilot—Prevents lighting of main burners until pilot has been lighted. In rare cases, where pilot goes out or gas supply fails, it shuts off main valve until pilot has been relighted.

DELCO-FRIGIDAIRE CONDITIONING DIVISION

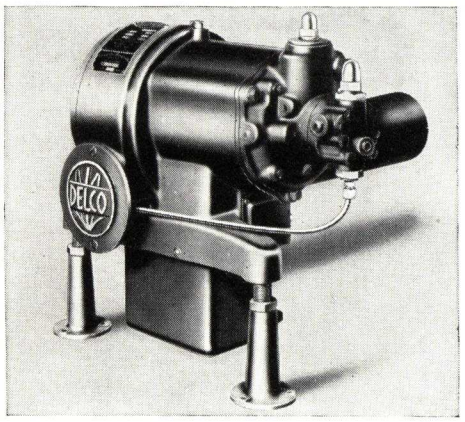
NEW DELCO OIL BURNER WITH THE "ROTOPOWER UNIT"

The Delco Oil Burner combines into one single removable unit, all the mechanical elements that ordinary burners must use as separate, independent moving parts. This advanced design means Fewer Working Parts, Less Wear, Smoother Operation, Longer Life, Less Servicing, Uninterrupted Warmth, Lower Fuel Cost and Less Electricity Used.

The single moving shaft of the "Rotopower Unit" revolves in and is supported by only two bearings. This means less friction. The power supply, the air-drive and the oil pump are all combined on this shaft. There are no shaft couplings, driving gears, belts or pulleys. The dynamic balance of the "Rotopower Unit", plus the rubber cushion between it and the frame, reduce vibration, jar and noise to a minimum.

The burner body is of heavy, sturdy construction, cast entirely in one piece. It is many pounds heavier than ordinary frames. Nothing can shake loose or get out of place. The air tube is of heavy rust and heat resisting metal. The oil pump is of the internal gear type, designed and precision built to provide long-lived, efficient operation without attention. Pump shaft seal is of the compression ring type which eliminates troublesome shaft packings.

The Delco Oil Burner is built as an integral part of the Delco Conditionair and the boiler unit. When it is used with an existing boiler or furnace, a combustion chamber is installed in the field, strictly according to factory engineering specifications, to match the characteristics of the particular boiler or furnace with which it is to operate. This assures maximum efficiency.



The "Rotopower Unit" Is Standard Equipment on Most Delco Oil Burners

SPECIFICATIONS

Design—Atomization ....Mechanical
Pressure .....100 lbs.
Ignition .....Intermittent
(Continuous optional on large models)
Air supply.....Low pressure
Fan .....Centrifugal type

Fuel Oil—Grade (U.S. Bureau of Standards Specs.)....No. 3

Motor—Type .....Split phase, long hour duty
D-34, D-44, Repulsion induction

Oil Pump—Design .....Internal gear type

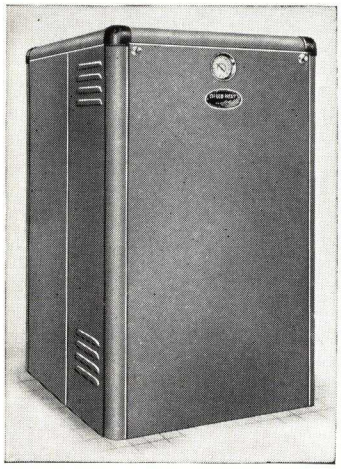
Strainer—Construction...Monel Metal

Chassis—Housing .....Cast iron
Air tube .....Cast iron, integral with main housing

Fuel Control—Type.....Delco "Thin-Mix"
Function .....Constant pressure and positive shut-off

Model	Capacity	Output of boiler or furnace		Gals. per hr.		Motor			Pump		Strainer, area sq. ins.	Net weight, lbs.
	B.t.u./hr.	E.d.r. steam	E.d.r. h.w.	Min.	Max.	Hp.	Watts	R.p.m.	Lift, ft.	Cap., g.p.h.		
DR1	105,600	440	700	1.0	1.35	1/8**	135	1740	8	13	17	100
DR	216,000	900	1440	1.35	2.75	1/8**	135	1740	8	13	17	100
DX	216,000	900	1440	1.35	2.75	1/8*	150	1735	8	13	18	107
D12	559,200	2330	3725	2.5	7.0	1/6†	160	1735	8	13	36	115
D34	1,296,000	5400	8600	7.0	16.5	1/3*†	415	1750	13	90	49.5	298
D44	2,880,000	12000	19200	15.0	30.0	3/4*†	760	1750	13	90	49.5	383

**Available in 110-volt, 60-cycle, a-c. only.
*Ratings based on 110 or 220-volt, 60-cycle, a-c. Also available in 25, 40 or 50-cycle and in 110-volt d-c.
†Ratings based on 110-volt 60-cycle, a-c. Also available in odd cycle or 110-volt d-c.
*†Ratings based on 110 or 220-volt 60-cycle a-c. D-34 available in 110 or 220-volt d-c. D-44, 220-volt only. Also available in 25-cycle.

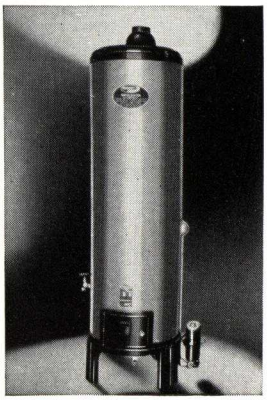


All Delco Automatic Furnaces are designed for the utmost in operating economy.

DELCO AUTOMATIC FURNACES FOR OIL OR GAS

The Delco Im-Pak-Tor Boiler employs the Im-Pak-Tor principle of heat transfer. Instead of ordinary horizontal flue gas passes or the old method of down travel, the travels of the hot gases in the Delco Im-Pak-Tor Boiler are upward—the natural way. Employing this principle, stack temperatures are lower than the vast majority of boilers. Lower stack temperatures are indicative of the amount of heat absorbed by the boiler—less valuable heat dissipated up the chimney. *This means fuel economy.*

DELCO HOT WATER HEATERS FOR OIL OR GAS



The new Delco Automatic Water Heaters are available for either gas or oil.

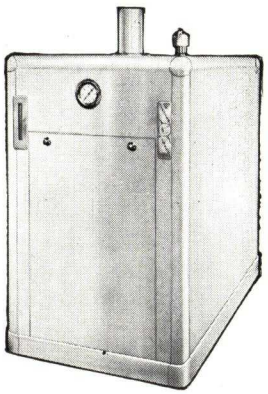
ELECTROL INCORPORATED

ESTABLISHED SINCE 1918
934 Main Avenue, CLIFTON, N. J.
NEW YORK OFFICE: 441 Lexington Avenue

BOILER-BURNER UNITS

Electrol-Kewanee and Electrol-American Series No. EA-6 Heating Units

The Electrol-Kewanee Unit is built of copper bearing steel, with patented, three-shell construction. The Electrol-American Unit has a cast-iron sectional boiler and is fired with the Electrol Model TCV Burner. Both units have built-in domestic water heaters and are enclosed in handsome, sound-insulated jackets finished in smart, light biege.



E-K Unit Features—Induced draft, making unit independent of chimney drafts. Minimum over-all efficiency of 80%. Rubber mounted motor. Welded boiler.

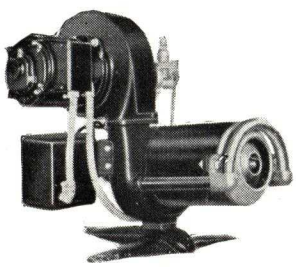
E-A Unit Features—Special heat absorbing surfaces. Large combustion chamber with ample space for efficient combustion. All parts completely enclosed.

Unit	Capacity, equivalent direct radiation, sq. ft.		Lbs. oil per hour	Capacity indirect water heater, gals. in 3 hours	Over-all dimensions, in.		
	Steam	Water			L	W	H
EK- 5	750	1200	11.5	50	47½	34	55¼
EK-10	1250	2000	19.4	80	60½	34	55¼
EK-15	1750	2800	27.0	100	75	34	55¼
EA6-4	530	850	8.5	*40	47 3/16	29¾	54⅝
EA6-5	650	1040	10.3	40	50 11/16	29¾	54⅝
EA6-6	770	1230	12.1	40	54 3/16	29¾	54⅝
EA6-7	890	1420	13.5	40	57 11/16	29¾	54⅝
EA6-8	1010	1610	14.9	40	61 3/16	29¾	54⅝
EA6-9	1130	1810	16.3	40	64 11/16	29¾	54⅝

*100 gals. at extra cost.

CONVERSION BURNERS

Designed for operation in any boiler or furnace, with or without extended jacket. Backed by 18 years of satisfactory and economical operation in thousands of homes and buildings throughout the world.



Model TUV

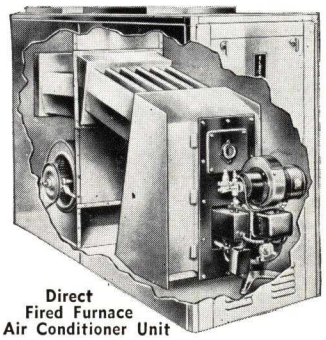
Features—Spiralon, producing rotating air for combustion and ball shaped flame that burns in complete suspension. Built-in Master Control, a safety that cannot become clogged with soot. Drip eliminator at nozzle. All parts interchangeable, eliminating obsolescence. Fully automatic. Can be hooked up with indirect heater for supplying year round domestic hot water.

Model	Capacity, equivalent direct radiation, sq. ft.		Gals. oil per hr.	
	Steam	Hot water	Min.	Max.
TCV	200-1100	350-1800	1.3	3.5
TUV	600-2800	1000-4500	2.	8.5
TM	2500-10000	4000-16000	8.5	24.

ELECTROL AIR CONDITIONING EQUIPMENT

Electrol Direct Fired Furnace Air Conditioner Units

A modern automatic oil fired furnace providing complete winter air conditioning with means for adding summer conditioning if desired. The Electrol Model DF Conditioner is made in four standard sizes and capacities are guaranteed as is an over-all efficiency of over 80% when operated at rated capacities.



Direct Fired Furnace Air Conditioner Unit

CAPACITIES—ELECTROL WARM AIR FURNACES SERIES D.F.

Model	B.t.u. per hour at bonnet	Oil rate, lbs. per hour	Heating surface, total sq. ft.	Air capacity	
				C.f.m. at 70°	Motor hp.
DF1	120,000	8.65	86	1450	¼
DF2	150,000	9.70	86	1650	⅓
DF3	175,000	11.90	86	1850	½
DF4	225,000	14.40	112	2450	¾

Electrol Split System Air Conditioning Units

The Electrol "Split-System" Air Conditioning Units consist of a blower unit, air filters, humidification assembly, heating coil with space provided for addition of summer cooling coil, if desired. An Electrol "Split-System" Unit transforms a radiator-heated home into a modern air-conditioned home. Both floor-mounted and ceiling-suspended types are available.

CAPACITIES—ELECTROL SPLIT-SYSTEM AIR CONDITIONING UNITS SERIES SS

Model	Heating capacity B.t.u. per hour		Air capacity		Cooling capacity B.t.u. per hour	
	Hot water	Steam	C.f.m.	Motor hp.	Cold water (50°)	Direct expansion (40°)
SS1	93,000	92,000	1120	¼	30,000	36,000
SS2	170,000	171,000	2000	⅓	49,000	66,000
SS3	233,000	247,000	2700	½	77,000	98,000
SS4	304,000	318,000	3600	¾	93,000	124,000
SS10	35,000	46,000	500	1/6	14,000	21,000
SS13	51,000	66,000	750	1/6	26,000	31,000
SS15	69,000	89,000	1000	¼	35,000	42,000

*Numbers 10, 13 and 15 are suspended type.

Electrol Gravity Warm Air Conditioner Units

An Electrol Blower Unit attached to an existing furnace, will filter the air, humidify it, and circulate it throughout a home. If the furnace is properly sized and installed, no changes should be necessary in the ducts. Humidifier, if used, is installed in jacket of furnace.

CAPACITIES—ELECTROL GRAVITY WARM AIR CONVERSION UNITS SERIES F.C.

Model	C.f.m.	Motor hp.	Furnace data—maximum permissible size		
			Furnace size, in.	Gravity pipe area rating, sq. in.	B.t.u. per hour
FC1	1000	1/6	24	550	75,000
FC2	1400	¼	28	820	112,000
FC3	2000	⅓	30	1150	157,000
FC4	2500	½	34	1400	190,000

FAIRBANKS, MORSE & CO.

Manufacturers of Air Conditioning Equipment

GENERAL OFFICES
900 So. Wabash Avenue
CHICAGO, ILL.

BRANCH OFFICES

ATLANTA, GA.
BALTIMORE, MD.
BIRMINGHAM, ALA.
BOSTON, MASS.
BUFFALO, N. Y.
CHICAGO, ILL.
CINCINNATI, OHIO
CLEVELAND, OHIO
COLUMBUS, OHIO
DALLAS, TEX.
DENVER, COLO.
DES MOINES, IOWA
DETROIT, MICH.
INDIANAPOLIS, IND.
JACKSONVILLE, FLA.
KANSAS CITY, MO.
LOS ANGELES, CALIF.
LOUISVILLE, KY.
MEMPHIS, TENN.
MILWAUKEE, WIS.
MINNEAPOLIS, MINN.
NEW ORLEANS, LA.
NEW YORK, N. Y.
OMAHA, NEB.
PHILADELPHIA, PA.
PITTSBURGH, PA.
PORTLAND, ORE.
PROVIDENCE, R. I.
ST. LOUIS, MO.
ST. PAUL, MINN.
SAN FRANCISCO, CAL.
SEATTLE, WASH.
STUTTGART, ARK.
WASHINGTON, D. C.

For F-M Automatic Coal Burners, see File Index

THE EQUIPMENT AND SERVICE

Air conditioning equipment is the product of exact science. It requires precision engineering. When you specify Fairbanks-Morse Air Conditioners you are specifying equipment that is the product of 108 years of precision engineering and manufacturing experience. You are specifying equipment that is backed by the warranty of a company that has never failed the users of its products.

Whether your requirements call for self-contained units, remote units, or central station systems, you will find the correct type and size in the Fairbanks-Morse 1938 complete line of air conditioning equipment.

Thirty-four Branches throughout the United States stand ready with Fairbanks-Morse 24-hour service. Every Branch maintains a corps of engineers to give expert counsel on any type of Fairbanks-Morse unit or installation problem.

A complete stock of standard repair parts enables each Branch to make quick-time service a working reality.

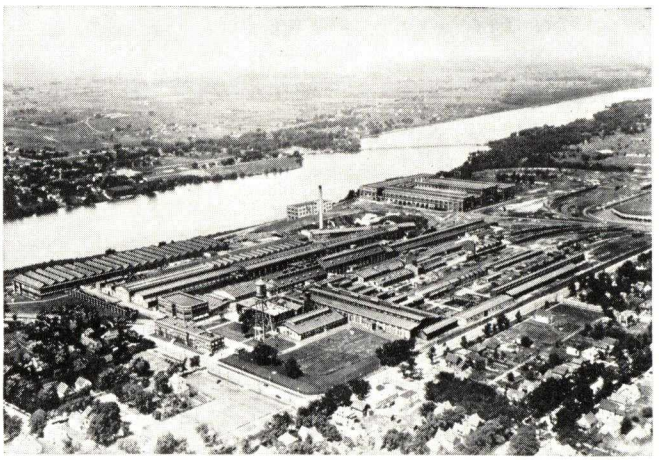
Plans, specifications and cost estimates on air conditioning homes, offices, stores, factories, theatres, hotels, shops, or any type of building will gladly be furnished, without cost or obligation.

SELF-CONTAINED UNITS

Fairbanks-Morse self-contained air conditioning units for summer cooling are available in two types. The air-cooled model is of ¾-ton capacity while the water-cooled type may be had in 1, 3 and 5-ton capacities. Both of these units are completely self-contained within the cabinet which is located within the conditioned space.

REMOTE UNITS

Remote air conditioners, for use with either water or Freon as a cooling medium, are built in capacities of from ¾ to 5 tons. This type of conditioner is located in the conditioned space and is connected to a condensing unit which is usually located in the basement.



The Fairbanks-Morse modern factory at Beloit, Wisconsin, where F-M air conditioning equipment is designed and manufactured

These units can be furnished to perform all the functions of year-round air conditioning or they can be supplied for partial conditioning if desired.

CENTRAL STATION SYSTEMS

Central system plants for complete year-round air conditioning are built by Fairbanks-Morse in both vertical and horizontal types for capacities of from 3 to 25 tons. The central plant is usually located in the basement and furnishes conditioned air to the desired space through ducts.

Write for descriptive Bulletins on F-M Air Conditioners.

Fairbanks-Morse has available a complete line of Blast Coils, Compressors from ½ to 20 hp., inclusive, and a complete line of Evaporative Condensers.

Automatic gas engine drives for compressors can also be furnished.

THERE IS NO SUBSTITUTE FOR PRECISION ENGINEERING

FITZGIBBONS

STEEL BOILERS

BOILER-AIR CONDITIONER
FITZGIBBONAIRE
OIL-EIGHTY AUTOMATIC
COAL-EIGHTY AUTOMATIC
RZU JR BOILER
RZU BOILER
POWER BOILERS

1938 EDITION

Fitzgibbons Boiler Company, Inc.

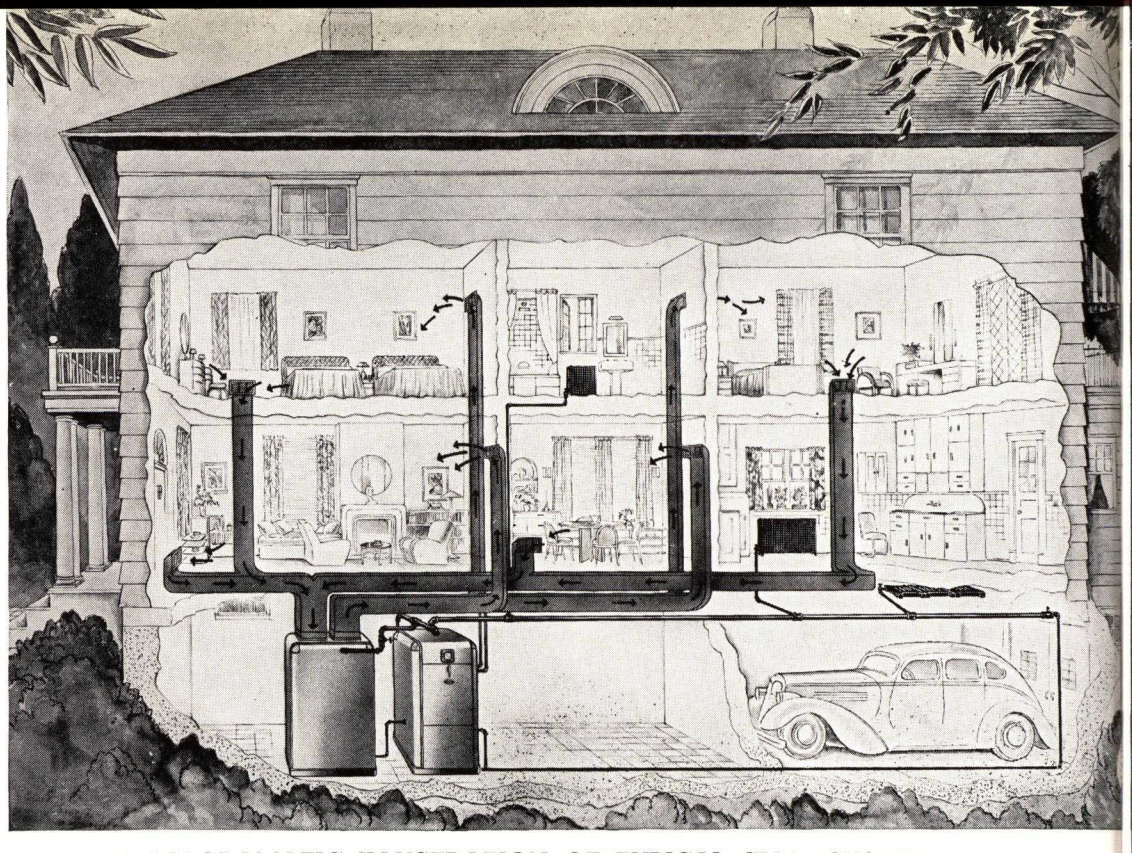
General Office and Show Rooms: Architects Bldg., 101 Park Avenue, New York, N. Y.
Works: Oswego, N. Y.
BRANCHES AND REPRESENTATIVES IN PRINCIPAL CITIES

FOR HEATING AND AIR CONDITIONING

The

"SPLIT SYSTEM"

AIR CONDITIONER
THE MODERN WAY
TO HEAT YOUR HOME
AND FURNISH YEAR
'ROUND HOT WATER



A DIAGRAMATIC ILLUSTRATION OF TYPICAL SPLIT SYSTEM
Note Ducts to Principal Rooms and Radiators to Minor Rooms

TYPES OF FITZGIBBONS APPARATUS FOR SPLIT SYSTEMS OF AIR CONDITIONING SERVICE

For NEW or OLD BUILDINGS

COMPLETE BOILER AND AIR CONDITIONING UNIT

The Boiler Air Conditioner combines within one stream-lined jacket all the functions of conditioned air, boiler radiator heat and domestic hot water supply. The jacket, in most cases, conceals the firing unit also, in the space provided, as shown in the broken away view on the following page. Therefore, the oil burner, gas burner or stoker may be enclosed within the jacket out of view and out of the way of possible injury through inexperienced tinkering. The Boiler Air Conditioner is equipped with the Fitzgibbons Tanksaver, the submerged copper coil which furnishes a plentiful supply of domestic hot water in Summer and Winter without the necessity for a storage tank.

FLOOR TYPE OF AIR CONDITIONING UNIT SEPARATE FROM BOILER

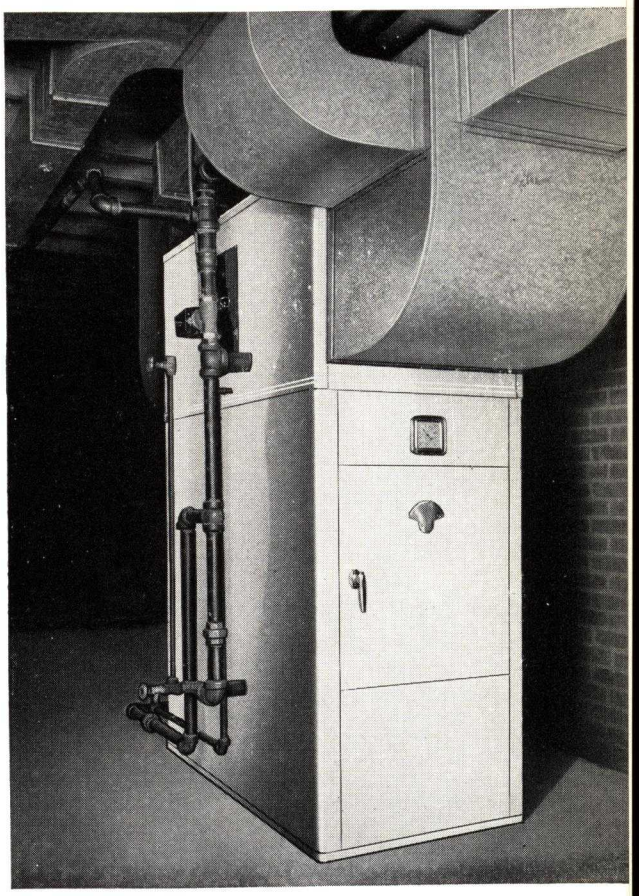
The Fitzgibbonsaire is an air conditioner floor unit which works in tandem with the Fitzgibbons Steel Boiler for oil, gas or stoker firing. This unit is often used to add air conditioning to a home already constructed, or in a new home where it is desirable to locate the air conditioning in one part of the basement, and the heating boiler in another. The operation of this unit is similar to that of the Boiler Air Conditioner previously described. Domestic hot water supply may be furnished with this type of installation as well, since the boiler may be equipped with the Fitzgibbons Tanksaver.

CEILING TYPE OF AIR CONDITIONING UNIT FOR SELECTED ROOMS

The Fitzgibbonsaire Junior is a ceiling type conditioner which extends the scope of air conditioning to homes that are already equipped with Fitzgibbons boilers, the subdivision of the house into air conditioned spaces and radiator heated spaces, and the zoning of heating with a home where it is desirable to place a number of units, all receiving their source of heat from the same boiler. Its chief advantages are that it is light in weight; quickly and easily installed; is suspended from the ceiling and takes up no floor space, and may be used in homes now equipped with hot water or steam heating systems. Furthermore, it can be adapted to Summer cooling by the simple installation of an additional coil.

FITZGIBBONS BOILER-AIR CONDITIONER

Before you select any system of air conditioning, it is well to know all that air conditioning can give you—all that the term may cover. For air conditioning may mean nothing but the supplying of dead, common, baked air more or less humidified; or it may mean a broad combination of services, which brings to the home of your client comfort, healthfulness and convenience. The latter type of air conditioning costs so little more at first, and actually saves so much in operation, that its greater services should be seriously considered before purchasing a cheaper job. This system of air conditioning is the "Split-System" which means first of all, correctly conditioned air properly humidified, thoroughly cleaned, adequately heated and evenly circulated. In addition to this, it means domestic hot water supply tanklessly and instantaneously, Summer and Winter, and the ability to use the source of heat for steam or vapor or hot water radiator heating in such rooms as kitchen, laundry, bath and garage, where, for obvious reasons, it is not practical to recirculate the air. This is best shown on the illustration on the preceding page. The Fitzgibbons Boiler Air Conditioner is one of such units and is described as follows:



FEATURES

Copper-Steel Construction—Entire boiler built of copper-bearing steel, assuring long life, durability and satisfactory heating service. Unit is shipped complete; quickly and easily installed. For the following features, refer to the numbered drawing below.

1. Heat Exchanger—Copper tube and copper fin type heating coil designed to heat air passing through it to required temperature with minimum resistance.

2. Tanksaver—Submerged instantaneous domestic copper coil, giving abundant hot water summer and winter without necessity of installing storage tank. Copper construction assures clean hot water together with maximum efficiency and economy.

3. Aquastat Tapping—Tapping in boiler provided for use of aquastat to control oil burner, gas burner or stoker for summer operation for domestic hot water heating.

4. Perfect Combustion—Combustion chamber specially designed for efficient use. Volume of combustion chamber insures plenty of space for fuel to burn completely.

5. Any Oil Burner, Gas Burner or Stoker—Oil burner, gas burner or stoker in present heating system or any one selected will find ideal conditions under which to operate. No matter what the heat unit, this Fitzgibbons boiler will do its full share.

6. Large Number of Fire Tubes—After gases have given up most of their heat to water surrounding combustion chamber, they pass through large number of small-diameter, copper-bearing steel tubes. These extract a large percentage of heat from the gases before they are allowed to pass into chimney, further contributing to boiler efficiency and low fuel cost.

7. Rear Door—Provides for easy inspection of rear end of boiler and gives ample space for cleaning tubes.

8. Combustrol (Combustion Control)—This unit, a swinging air control in rear of boiler, maintains draft in boiler at regular rate and contributes to steady burning of fuel.

9. Silencer—Muffles combustion sounds and insures quiet.

10. Thermalizer—This device controls flow of gases through boiler so they are kept in boiler as long as possible and made to give up every available heat unit. It also counterbalances effect of varying draft conditions and contributes to steady operation of burner flame.

11. Insulation—Boiler is insulated with highly efficient, sound-deadening insulation beneath attractive baked-enamel metal jacket, with chromium trimmings and large access doors.

12. Motor—Capacitor start, induction run for quiet operation. Bearings need oiling only once a year. Resilient-mounted, with variable tension control for V-belt pulley drive to fan.

13. Filters—Spun glass, impregnated with oil. Easily removed and inexpensively replaced.

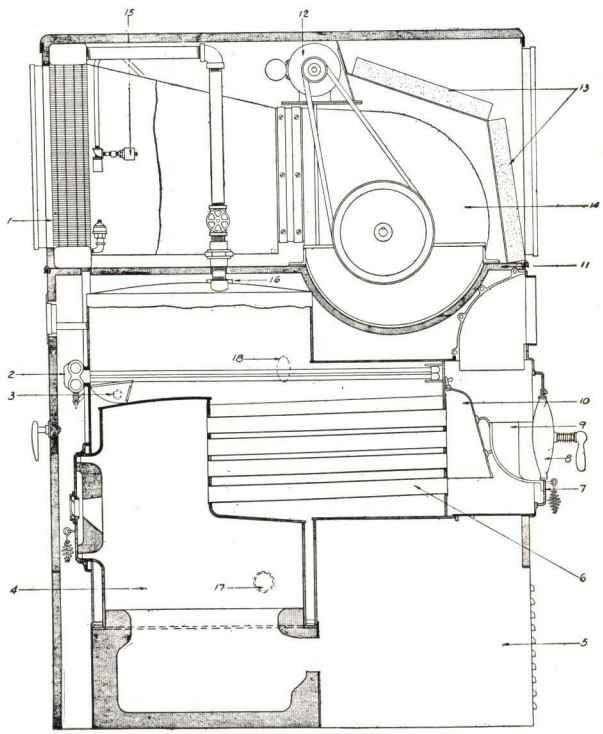
14. Fan—Double inlet squirrel-cage type, designed to operate at slow speeds for maximum air delivery. Blower mounted on sound-absorbing base and thermo-porous bronze bearings require oiling only once a year.

15. Humidifier and Controls—Spray nozzle type with "self-cleaning" feature, controlled by humidistat. Other controls furnished with equipment are: reverse acting pressure switch, summer-winter switch and plate, low water cutoff, solenoid valve.

16. Steam Radiator Connections—2″ steam outlets for connection of radiation to be heated by steam.

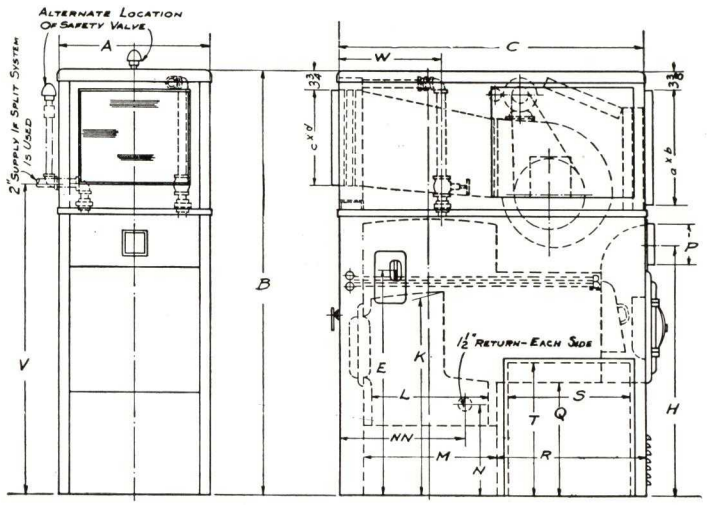
17. Return Radiator Connections—1½″ return outlets for connection of radiation to be heated by steam.

18. Low Water Cut-Off Tapping—2½″ tapping for installation of low water cut-off.



Reference Numbers

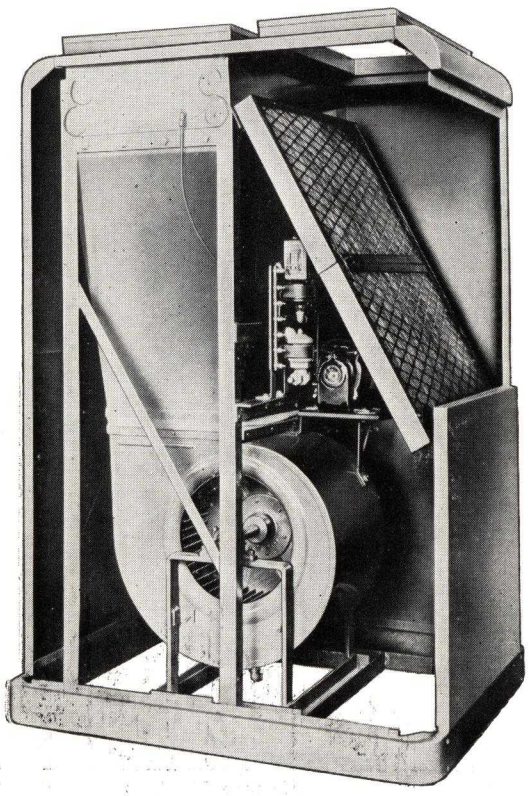
RATINGS & DIMENSIONS OF THE BOILER-AIR CONDITIONER

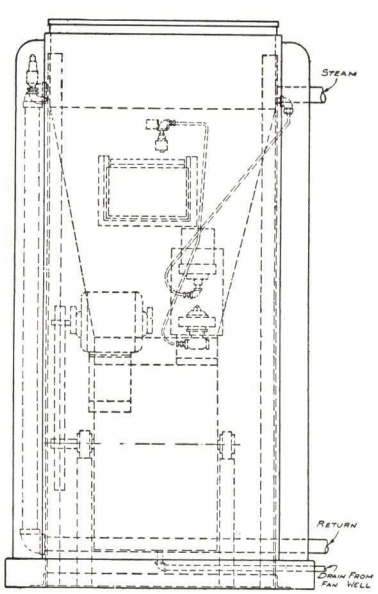


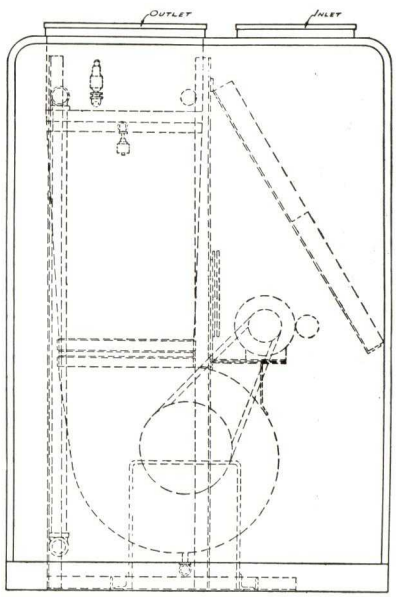
Fitzgibbons Boiler-Air Conditioner		130M2	130M3	163M2	163M3
Boiler Capacity	B.T.U.	129600	129600	163200	163200
Exchanger Capacity	B.T.U.	102000	129300	128700	163100
Temperature at Outlet Based on 65° Inlet	Degrees	140°	160°	140°	160°
Fan Capacity ¼" S. P.	C.F.M.	1260	1260	1590	1590
Fan	R.P.M.	657	725	569	632
Motor Size	H.P.	⅓	½	⅓	½
Domestic Hot Water Gals. Saver Capacity	Hr.	170	170	220	220
Width—Bare Boiler	In.	23½	23½	26½	26½
A—Width Overall	In.	26	26	29	29
B—Height Overall	In.	73⅜	73⅜	81⅞	81⅞
C—Length	In.	52⅜	52⅜	55¾	55¾
E—Water Line	In.	40⅜	40⅜	43⅛	43⅛
H—Height Smoke Outlet	In.	43¾	43¾	48¼	48¼
K—Comb. Chamber (Gun Burner)	In.	34⅛	34⅛	38½	38½
L—Diameter	In.	20⅜	20⅜	23⅜	23⅜
M—Base Depth	In.	23½	23½	26½	26½
N—Height of Return	In.	14¾	14¾	15	15
NN—Location of Return	In.	22⅜	22⅜	24⅜	24⅜
P—Size of Smoke Pipe	In.	8	8	8	8
Q—Floor to Hor. Shell	In.	19¾	19¾	24¼	24¼
R—Base to Rear of Jacket	In.	24¾	24¾	25⅛	25⅛
S—Width of Jacket Opening	In.	21	21	21	21
T—Height of Jacket Opening	In.	26	26	26	26
V—Height of Steam Outlet	In.	55½	55½	60	60
W—Location 2" Supply (Split System)	In.	18⅜	18⅜	19⅞	19⅞
axb—Air Inlet	In.	19¾x21¼	19¾x21¼	23¾x24¼	23¾x24¼
cxd—Air Outlet	In.	15x21	15x21	18x21	18x21
Diam. Chimney	In.	8	8	8	8
Height Chimney	Ft.	25	25	30	30
Approx. Shipping Weight	Lbs.	1575	1615	1800	1850

THE FITZGIBBONSAIRE— For "Split-Systems"—A Floor Unit for Use with Automatically Fired Boilers

Designed especially for the popular "split-system" method of air conditioning—the combination of air conditioning in selected rooms and boiler-radiator heat elsewhere in the house—the Fitzgibbonsaire is a floor unit air conditioner for installation with Fitzgibbons Boilers for oil, gas or stoker firing. It is compact, silent, sturdily constructed and attractively finished. Its design permits its location in any desirable place in the basement plan, regardless of boiler location. It is built in a range of sizes adaptable to practically any residential requirement.







FITZGIBBONSAIRE FOR STEAM

Fitzgibbonsaire		91	146	213	292	364	116	185	270	369	462
Exchanger Capacity	B.T.U.	91300	145800	212800	291600	364500	115700	184600	269600	369300	461700
E. D. R. Steam	Sq. Ft.	380	607	886	1215	1518	482	769	1123	1538	1923
FanCapacity–¼"Static.	C.F.M.	1128	1800	2628	3600	4500	1128	1800	2628	3600	4500
Air Temp. Based on 65° Inlet	Degrees	140	140	140	140	140	160	160	160	160	160
Fan Speed	R.P.M.	662	558	656	558	526	738	620	720	620	576
Fan Size	#	1	1⅛	2–1	2–1⅛	2–1¼	1	1⅛	2–1	2–1⅛	2–1¼
Motor Size	H.P.	⅓	½	¾	1	1	⅓	½	¾	1	1
Steam Conn.	In.	1–1½	1–1½	2–1½	2–1½	2–1½	1–1½	1–2	2–2	2–2½	2–2½
Return Conn.	In.	1	1	1¼	1¼	1¼	1	1	1½	1½	1½
Height Steam Conn.	In.	51⅞	54⅞	54⅞	57⅞	65⅜	51⅞	54⅞	54⅞	57⅞	65⅜
Air Intake Size	In.	12x23½	12x29½	12x47½	12x53½	15x65½	12x23½	12x29½	12x47½	12x53½	15x65½
Air Discharge Size	In.	16⅜x23½	19⅜x29½	16⅜x47½	19⅜x53½	19⅜x65½	16⅜x23½	19⅜x29½	16⅜x47½	19⅜x53½	19⅜x65½
Height Overall	In.	58½	61½	61½	64½	72	58½	61½	61½	64½	72
Width Overall	In.	32½	38½	56½	62½	74½	32½	38½	56½	62½	74½
Length Overall	In.	39½	42½	39½	42½	45½	39½	42½	39½	42½	45½
Approx. Shipping Weight	Lbs.	500	600	800	950	1100	550	650	875	1050	1200

Based on Steam at 5 Lbs. Pressure.

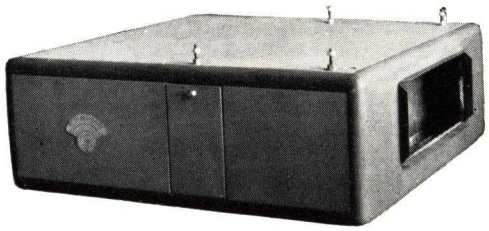
FITZGIBBONSAIRE FOR HOT WATER

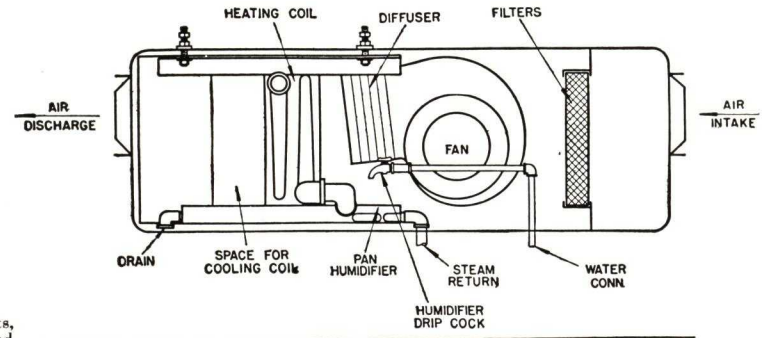
Fitzgibbonsaire		116-W	185-W	270-W	369-W	462-W
Exchanger Capacity	B.t.u.	79185	126360	198677	291600	364500
E. D. R. Hot Water	Sq. Ft.	528	842	1324	1944	2433
Fan Capacity—¼" Static	C.F.M.	1128	1800	2628	3600	4500
Air Temp. Based on 65° Inlet	Degr's	130	130	135	140	140
Air Velocity	F.P.M.	600	600	600	600	600
Inlet Hot Water Temp.	Degr's	200	200	200	200	200
Outlet Hot Water Temp.	Degr's	192	190	188	189	187
Water Thru Coil	G.P.M.	19.8	25.3	33.1	53.0	56.1
Water Velocity	F.P.M.	49.5	52.4	82.8	109.7	116.1
Water Pressure Loss, Lbs.	Sq. In.	0.18	0.26	0.45	0.96	1.06
Fan Speed	R.P.M.	738	620	720	620	576

Fitzgibbonsaire		116-W	185-W	270-W	369-W	462-W
Fan Size	No.	1	1⅛	2-1	2-1⅛	2-1¼
Motor Size	H.p.	⅓	½	¾	1	1
Inlet Coil Conn.	In.	1-1½	1-2	2-2	2-2½	2-2½
Return Coil Conn.	In.	1-1½	1-2	2-2	2-2½	2-2½
Height Coil Conn.	In.	51⅞	54⅞	54⅞	57⅞	65⅜
Air Intake Size	In.	12x23½	12x29½	12x47½	12x53½	15x65½
Air Discharge Size	In.	16⅝x23½	19⅝x29½	16⅝x47½	19⅝x53½	19⅝x65½
Height Overall	In.	58½	61½	61½	64½	72
Width Overall	In.	32½	38½	56½	62½	74½
Length Overall	In.	39½	42½	39½	42½	45½
Approx. Shipping Weight	Lbs.	550	650	875	1050	1200

FITZGIBBONSAIRE JUNIOR AIR CONDITIONERS

for SELECTED ROOMS





AIR CONDITIONING UNIT—Complete, includes casing with hanger bolts, filters, fans with diffusers, heating coil and air valve, humidifier with heater and drip cock, water strainer, pressure reducing valve, solenoid valve, drain pan, thermal fan control, safety thermal main switch, air circulation switch, transformer and fan motor for 110 volt, 60 cycle, single phase.

Connections to the unit consist of a steam supply and return, water supply to the humidifier, humidifier overflow and dehumidifier drain, and electrical service connection to control box. Sheet metal connections consist of supply and return ducts.

The Fitzgibbonsaire Junior Air Conditioning Unit extends the scope of domestic air conditioning to:

1. FOR HOMES ALREADY EQUIPPED WITH FITZGIBBONS BOILERS. No limitation is placed to existing boilers except that the water line must not be too high to prevent satisfactory return of condensate to the boiler.

By means of duct work, old houses may be provided with air conditioning in a given number of rooms.

2. SUB-DIVISION OF THE HOUSE INTO AIR CONDITIONED SPACES AND HEATED SPACES. The unit permits complete air conditioning in selected rooms of the house; and the heating by direct radiation of garage, baths and kitchens and other rooms, which for obvious reasons, do not require air conditioning.

3. ZONING—MULTIPLE UNITS. The idea of zoning extends also to the use of more than one unit supplied by a single boiler, as well as to the "split" system. The unit can be used in conjunction with our larger Air Conditioners for zone control. Such use of multiple units is frequently practical when construction costs and space limitations make the use of large units impracticable.

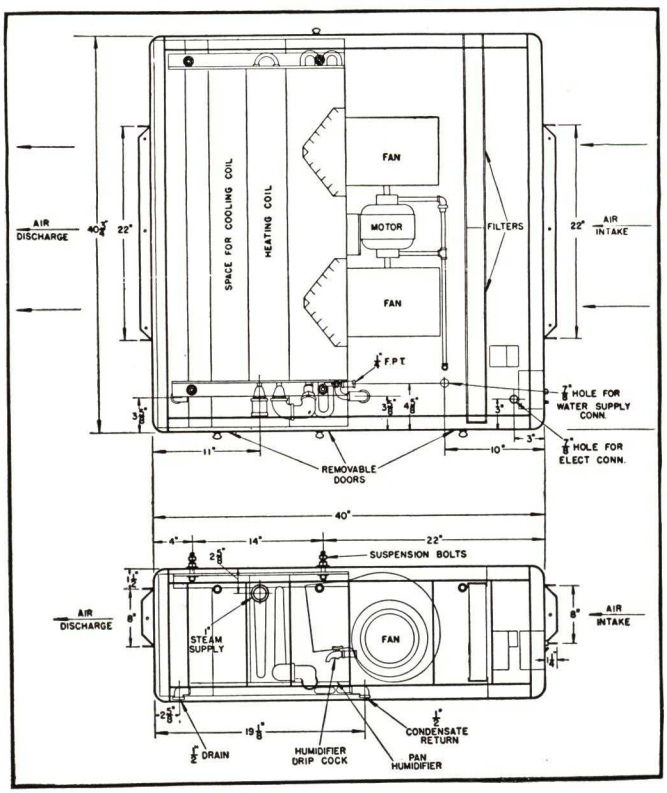
COMBINATIONS

Humidifying Only		Heating and Humidifying	
Humidifying	Filtering	Humidifying	Filtering
Tempering	Circulating	Heating	Circulating

Light in weight . . . quickly and easily installed.

Suspended from the ceiling, it takes up no floor space.

May be used in homes now equipped with hot water or steam heating systems.



SUMMER COOLING

Conditioning for comfort in summer is obtained by inserting a cooling coil in the space provided. The air is cooled and dehumidified by passing over this coil. A refrigeration compressor is connected to the coil. Freon is the refrigerant used in this direct expansion system. Coils for cold water circulation are also available.

In order to obtain summer cooling and dehumidifying with this unit, it is necessary to add the following:

1. Cooling coil.
2. Supply and return refrigerant lines with required valves for control.
3. Refrigeration compressor, Freon refrigerant, for connection to cooling coil.
4. Controls, which are separate from the controls used for the heating function.

OPERATING CYCLE

Return air is drawn from the building through a duct connected to the air intake of the Conditioner. It passes through the filters, enters the fan and is discharged through the heating coil into the supply duct, which distributes it to the various rooms. As it passes the humidifier, the air picks up water vapor. Heat for the vaporization of water is supplied by a steam coil which is an integral part of the humidifier. Water is supplied to the humidifier by means of a drip cock, which is manually adjusted.

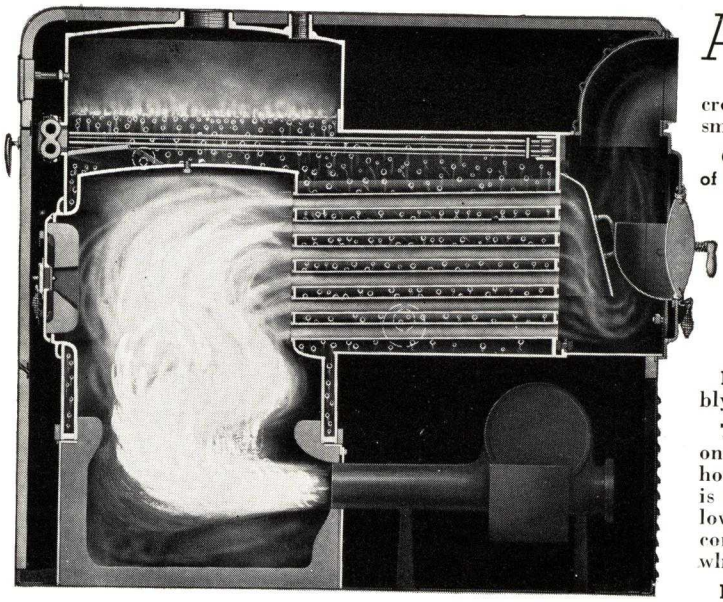
RATINGS AND CAPACITIES
HEATING AND TEMPERING
Based on 2-lb Steam or 220° Hot Water*

Type	Heating	Tempering
Fan Speed in r.p.m.	870	870
Air Capacity in c.f.m. at 70° F.	450	550
Air Capacity in c.f.m. at Final Temperature	530	610
Output in B.t.u. per Hr.	48700	35500
External Static Pressure available in In. Water	.06	.06
Temperature of Air at Discharge in °F.	170	130
Motor Horsepower	1/30	1/30
Water Evaporated Lb. per Hr.	8.4	8.4
Water Evaporated Gal. per Hr.	1	1

*Forced circulation and 220° water necessary with hot water systems, to maintain capacities.

The above ratings are for 60 cycle current.

The FITZGIBBONS OIL-EIGHTY AUTOMATIC BOILER



FOR USE WITH ANY GOOD OIL BURNER

Here is a graceful, efficient and economical domestic heating boiler that combines with any good oil burner—gun or rotary type—to form a heating unit of outstanding merit. It insures these advantages—economical oil heat; provision for protected controls; and all-year hot water. In its design, every economy principle developed in large boiler building was rigidly adhered to—as is evident by study of the following.

FEATURES

Fitzgibbons Copper-Steel Construction—Which combines strength and resiliency with life-time, crack-proof, rust-resisting durability.

Exceptionally High Combustion Chamber—Provides ample room for complete combustion of gases without impingement against crown sheet, even with long-flame fuels. This contributes to smokeless operation and makes it unnecessary to raise the boiler.

Complete Combustion, Efficient Heat Transfer and Quick Pick-up of Heating Load—Are assured by these exclusive features:

Completely Enclosed Down to Floor—This, with thickly insulated steel jacket, prevents escape of fly ash and confines heat inside boiler—a real advantage for summer hot water operation.

Machine Finished and Gasket-Sealed Doors—Prevent dust and coal dust from escaping and aid combustion by excluding excess air.

Easy to Install—Because it comes as a unit, requiring no assembly on the job other than the jacket.

Two Aquastat Tappings—While only one aquastat is required on steam or vapor installations, two aquastats are essential on a hot water boiler where a Tanksaver is used. The upper aquastat is of the "immersion" type for summer hot water control. The lower is a reverse acting aquastat wired to the circulator pump controlling its operation. This prevents lag in heating the water when house calls for heat and Tanksaver is in use.

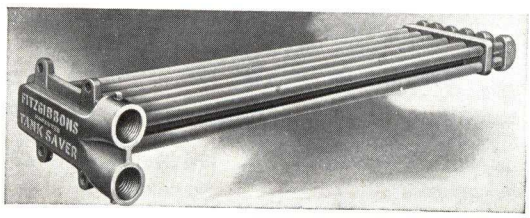
Easy to Clean—All combustion surfaces, including straight, unobstructed fire tubes, are readily accessible through large front or rear doors.

Stokers Can Be Installed in Rear or on Either Side—Which leaves front door clear for cleaning boiler.

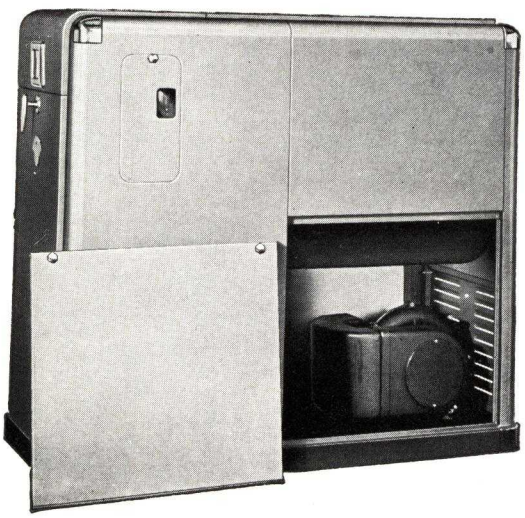
Twelve Sizes—These make it possible to meet the exact heating needs of any residence, large or small.

Hot Water Supply

Year 'round, clean hot water, economically supplied, without storage tank, by Fitzgibbons Tanksaver illustrated below.



The FITZGIBBONS COAL-EIGHTY AUTOMATIC BOILER



FOR ANTHRACITE STOKER FIRING IN RESIDENCES

A thorough survey of domestic stoker requirements formed the basis for the design of this boiler. As a result, it satisfies every need from the standpoint of both installation and operation—is a perfect team-mate for any domestic stoker burning anthracite.

Check the following summary of features, and you will find it includes everything that could be asked for in a boiler for domestic stoker firing.

Anthracite Institute Approved

The Fitzgibbons Coal-Eighty Automatic has been awarded the CERTIFICATE OF APPROVAL of Anthracite Industries, Inc., after exhaustive tests in its laboratory at Primos, Pennsylvania.

For Ratings and Dimensions, See Page 7

RATINGS AND DIMENSIONS OF OIL-EIGHTY AND COAL-EIGHTY AUTOMATIC BOILERS

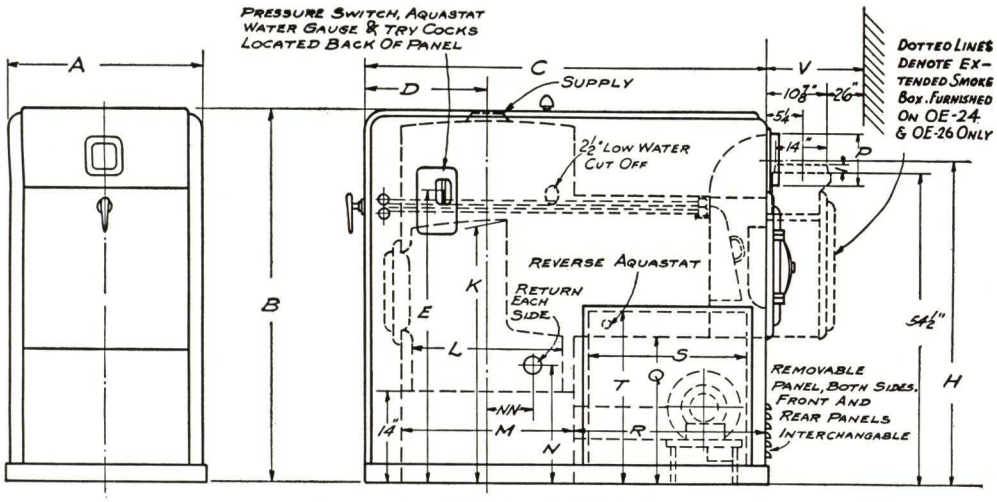


Diagram for Oil-Eighty Automatic Boiler

RATINGS

Ratings given in this catalog can be depended upon. They are the total radiation loads (taken at the boiler outlet) which the respective boilers will heat, with 2 lbs. pressure at the boiler for Steam, and 180° F. for Hot Water. Ratings are expressed in square feet of equivalent cast iron radiation, emitting 240 B.t.u. per sq. ft. per hour for Steam, and 150 B.t.u. per sq. ft. per hour for Hot Water.

Included with each boiler: flue brush and rod; steam gauge; water gauge, glass and gauge cocks; safety valve.

With boilers for hot water heating a special combination thermometer, altitude gauge and relief valve are supplied.

Oil-Eighty Boiler Number		OE4	OE5	OE6	OE7	OE9	OE11	OE13	OE15	OE18	OE20	OE24	OE26
Coal-Eighty Auto. Number		CA4	CA5	CA6	CA7	CA9	CA11	CA13	CA15	CA18	CA20	CA24	CA26
Rating—Steam	Sq. Ft.	425	510	612	714	901	1105	1326	1523	1800	2000	2400	2680
Rating—Hot Water	Sq. Ft.	680	816	979	1142	1441	1768	2121	2420	2820	3200	3840	4288
Heating Surface	Sq. Ft.	25	30	36	42	53	65	78	89	106	119	142	159
Furnace Volume (Less Base)	Cu. Ft.	3.2	3.2	4.4	4.4	6.2	6.2	8.6	8.6	11.3	11.3	14.7	14.7
Gross Base Volume	Cu. Ft.	3.0	3.0	3.6	3.6	4.6	4.6	5.7	5.7	6.5	6.5	8.3	8.3
Width—Bare Boiler	In.	21½	21½	23½	23½	26½	26½	29½	29½	29¾	29¾	29¾	29¾
A—Width—Overall	In.	24½	24½	26½	26½	29½	29½	32½	32½	32½	32½	32½	32½
B—Height—Overall	In.	53	53	55	55	56¼	56¼	59	59	67¼	67¼	67¼	67¼
C—Length	In.	51⅛	51⅛	53⅛	53⅛	61⅞	61⅞	68½	68½	70¾	70¾	78¼	78¼
D—Location Supply	In.	15⅝	15⅝	16⅝	16⅝	18⅛	18⅛	19⅝	19⅝	21⅜	21⅜	25	25
E—Water Line	In.	41	41	44	44	44	44	47	47	54½	54½	54½	54½
H—Height of Smoke Outlet	In.	46⅛	46⅛	48⅛	48⅛	49⅜	49⅜	51⅝	51⅝	60	60	.....	.....
I—Height of 1" Pipe Tap	In.	39¾	39¾	43	43	43	43	46	46	53¼	53¼	53¼	53¼
K—Comb. Chamber—Gun Burner	In.	37	37	39¼	39¼	40¾	40¾	43	43	51	51	51	51
L—Diameter	In.	18⅜	18⅜	20⅜	20⅜	23⅜	23⅜	26⅜	26⅜	29⅞x26⅜	29⅞x26⅜	37x26⅜	37x26⅜
M—Base Depth	In.	22¾	22¾	24¾	24¾	27¾	27¾	30¾	30¾	34¼	34¼	41⅜	41⅜
N—Height of Return	In.	16¾	16¾	17	17	17	17	17½	17½	18	18	18	18
NN—Location of Return	In.	5¾	5¾	6½	6½	7	7	7¾	7¾	9½	9½	13	13
P—Size of Smoke Pipe	In.	8	8	8	8	9	9	10	10	12	12	14	14
Q—Floor to Hor. Shell	In.	22¼	22¼	24¼	24¼	22¾	22¾	23¼	23¼	24	24	24	24
R—Base to Rear of Jacket	In.	23⅜	23⅜	23⅜	23⅜	29⅛	29⅛	32¾	32¾	31½	31½	31⅞	31⅞
S—Width Jacket Openings	In.	23	23	23	23	29¾	29¾	32⅞	32⅞	32	32	32	32
T—Height Jacket Openings	In.	26¼	26¼	26¼	26¼	26¼	26¼	26¼	26¼	26¼	26¼	26¼	26¼
V—Space to Open Rear Doors	In.	20	20	20	20	23	23	25	25	26	26	.....	.....
Size of Supply	In.	3	3	4	4	4	4	5	5	6	6	6	6
Size of Return	In.	2–2½	2–2½	2–3	2–3	2–3	2–3	2–3½	2–3½	2–4	2–4	2–4	2–4
Diam. of Chimney	In.	8	8	8	8	9	9	10	10	12	12	14	14
Height of Chimney	Ft.	25	25	30	30	35	35	40	40	45	45	50	50
Approx. Shipping Weight	Lbs.	965	985	1090	1120	1340	1390	1560	1690	2050	2100	2450	2540

CA and OE 24 and CA and OE 26 have extended smoke box like standard model.

FITZGIBBONS STOKER-EIGHTY

A RESIDENCE STEEL BOILER FOR BITUMINOUS COAL STOKERS

The design of this boiler is based on the findings of a thorough survey and study of mechanical stokers for Bituminous Coal. As a result, the Stoker-Eighty teams up perfectly with any good stoker to give an automatic heating unit that is efficient, easily cleaned, attractive and adaptable to modern automatic firing methods.

All Copper Steel Construction

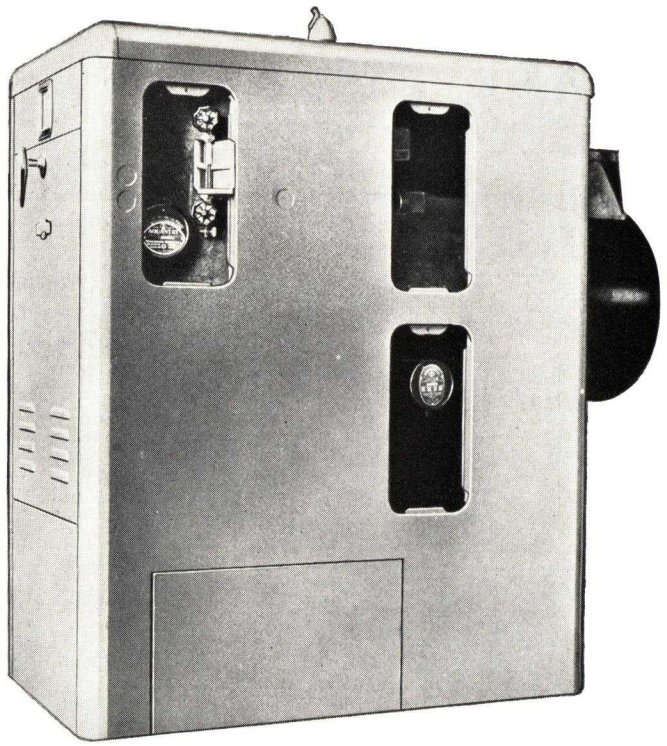
Built entirely of Copper-Bearing Steel (plates and tubes) the boiler combines strength with life-time crack-proof rust-resisting durability.

High Combustion Chamber

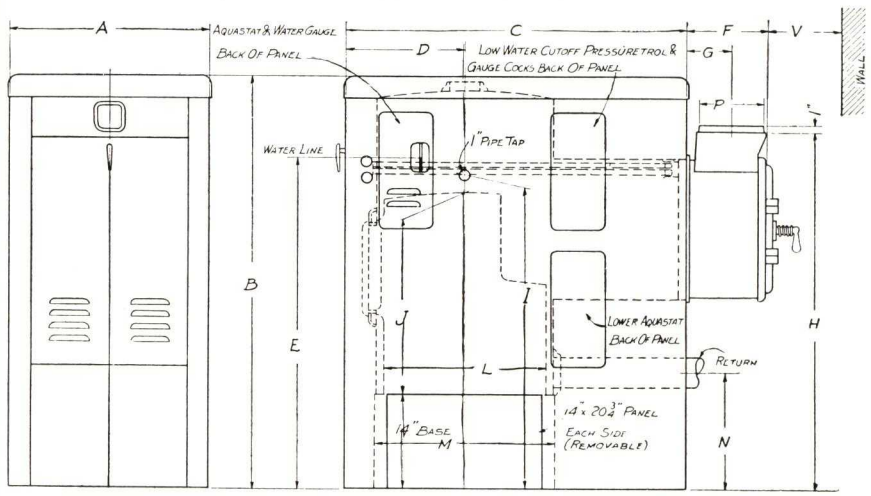
This feature provides ample room for complete combustion of the gases before they strike the crown sheet, even with the "long flame" coals. This means a degree of smokeless operation heretofore unobtainable. The 14-in. high base additionally helps to avoid the necessity of raising the boiler.

Insulating Jacket

The Stoker-Eighty is enclosed in a thickly insulated steel jacket extending all the way down to the floor. This prevents the escape of soot and ash, conserves heat and gives an attractive appearance.



RATINGS AND DIMENSIONS



STOKER-EIGHTY SPECIFICATIONS

Boiler Number		S-5	S-6	S-7	S-8	S-9	S-11	S-13	S-15
Rating—Steam	Sq. Ft.	485	600	720	840	960	1100	1300	1500
Rating—Hot Water	Sq. Ft.	776	960	1152	1344	1536	1760	2080	2400
Heating Surface	Sq. Ft.	29	36	43	50	57	65	77	89
Furnace Volume (Less Base)	Cu. Ft.	4.5	4.5	6.5	6.5	8.5	8.5	10.8	10.8
A—Width—Overall	In.	26½	26½	29½	29½	32¾	32¾	32¾	32¾
B—Height—Overall	In.	56⅛	56⅛	58⅝	58⅝	60⅞	60⅞	67	67
C—Length	In.	45	45	53¼	53¼	55¼	55¼	61	61
E—Water Line	In.	45⅝	45⅝	48⅛	48⅛	50⅜	50⅜	56½	56½
J—Height Firebox	In.	27½	27½	30	30	32	32	38	38
L—Diameter	In.	20⅜	20⅜	23⅜	23⅜	26⅝	26⅝	26⅝	26⅝
M—Base Depth	In.	23¾	23¾	26¾	26¾	30	30	30	30
N—Height of Return	In.	17½	17½	17½	17½	18¼	18¼	18¼	18¼
P—Size of Smoke Pipe	In.	9	9	9	9	10	10	12	12
V—Space to Open Rear Door	In.	20	20	20	20	23	23	25	25
Size of Supply	In.	4	4	4	4	5	5	5	5
Size of Return	In.	4	4	4	4	5	5	5	5
Diam. of Chimney	In.	9	9	9	9	10	10	12	12
Height of Chimney	Ft.	30	30	38	38	40	40	45	45
Approx. Shipping Weight	Lbs.	1040	1050	1350	1380	1560	1580	1700	1730

Specially placed removable panels permit access to tappings for the controls and allow placement of the stoker on either side or front. Machine finished and gasket sealed doors also prevent escape of soot.

Domestic Hot Water Supply

An abundant supply of hot water both summer and winter is furnished through the Fitzgibbons Tanksaver, a submerged copper coil. This is an instantaneous heater eliminating the storage tank. Special tank-heater coils can be furnished when requirements demand the use of a tank.

Easy to Clean

Because all combustion surfaces, including the straight unobstructed tubes, are readily accessible through large doors at both the rear and front, the boiler can be thoroughly cleaned in a few moments. It is thus possible to maintain the initial high efficiency for which this boiler is noted.

Steam, Vapor, Vacuum or Hot Water Types

Adaptable to any heating system, steam, vapor, vacuum or hot water, it is made in a range of sizes which suit perfectly the requirements of residential heating. Ratings are the full load that the boiler will carry but do not include provision for domestic hot water which must be added in accordance with usual practice.

Adaptable to Air Conditioning

The Stoker-Eighty is ideally suited to air conditioning should the home-owner decide to add this feature at a later date and will operate with high efficiency with the Fitzgibbonsaire, Fitzgibbonsaire Junior "split-system" air conditioners.

FITZGIBBONS R-Z-U JUNIOR STEEL BOILER

For Coal, Oil, Gas or Stoker Firing

R-Z-U Junior—Jacketed

An adaptation of the famous Fitzgibbons R-Z-U Boiler, which has such widespread popularity in the field of larger buildings, the R-Z-U Junior is made in sizes suitable for large residential and smaller institutional, business, public, and apartment buildings. It brings to this field the same excellent heating performance and economy. In addition, it provides year 'round hot water supply—either with or without a storage tank. It is adapted for steam, vapor, vacuum, or hot water systems, and for burning anthracite and bituminous coals, or for mechanical firing with oil, gas or stoker.

The boiler may be equipped with the Fitzgibbons Tanksaver—a submerged copper coil which provides year 'round domestic hot water supply without the necessity for a storage tank. Where a tank is already installed, the boiler may be purchased with a Fitzgibbons Tankheater copper coil.

The units are exceptionally compact—largest size will pass through 31″ doorway; medium and small sizes are less than 28″ in overall width. Water line is low enough to allow boiler installation in rooms of ordinary height, without a pit. It has large doors and openings which facilitate installation of oil burners and stokers. Door edges and frames are machined for accurate fit. Extra large door at front makes tube cleaning easy.

Units can be supplied jacketed or unjacketed, as desired. Jacket is of heavy gauge steel, tastefully enameled in blue.

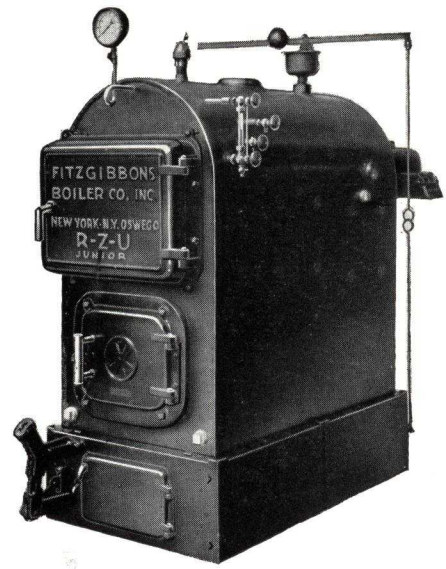
Grate—Grate supplied for coal burning is of regulation Fitzgibbons heavy-duty type. Grate bars are readily removable if desired to change from coal to oil or other automatic firing systems.

Auxiliary Grate—This is optional equipment with all oil-fired R-Z-U Junior Boilers. Can be used for hand firing in case of temporary shut-down of primary source of heat supply. Also provides means of refuse disposal.

Standard Equipment for Coal Burning—Included with each boiler for coal burning: iron base; rocking grates; bridge wall; fire tools, consisting of hoe, poker, slice bar; steel flue brush and rod; steam gauge; water column with water gauge; glass and gauge cocks; safety valve; damper regulator.

Standard Equipment for Oil, Gas or Stoker Firing—Included with each boiler for mechanical firing: Same as for Coal Burning, excepting rocking grates; bridge wall; fire tools; and damping regulator.

Note: When ordering for hot water heating, equipment furnished for both of above types in lieu of steam trimmings: altitude gauge; thermometer; relief valve; and damper regulator.



R-Z-U Junior—Without Jacket

FOR COAL BURNING (HAND FIRED)

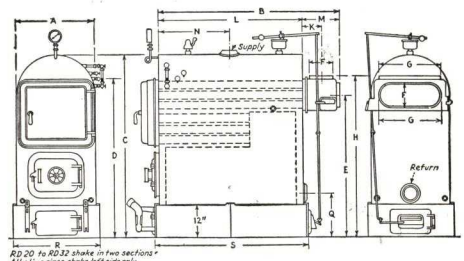
Boiler Number		RD-9	RD-10	RD-11	RD-12	RD-13	RD-17	RD-19	RD-21	RD-24	RD-29	RD-32
Rating—Steam—S. H. B. I.	Sq. Ft.	900	1000	1100	1275	1400	1700	1950	2100	2400	2900	3200
Rating—Hot Water	Sq. Ft.	1440	1600	1760	2040	2240	2720	3120	3360	3840	4640	5120
Heating Surface	Sq. Ft.	65	73	79	92	100	123	140	150	172	208	230
Grate Area	Sq. Ft.	5.3	5.7	6.2	7.1	7.8	8.1	8.8	9.2	10.2	12.4	13.5

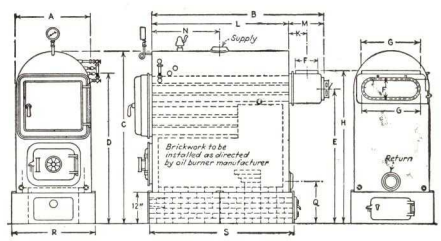
FOR OIL, GAS OR STOKER-FIRING

Boiler Number		RM-11	RM-12	RM-13	RM-15	RM-16	RM-19	RM-23	RM-25	RM-29	RM-35	RM-39
Rating—Steam S. H. B. I.	Sq. Ft.	1100	1240	1340	1560	1700	2090	2380	2550	2920	3500	3900
Rating—Hot Water	Sq. Ft.	1760	1984	2144	2496	2720	3344	3808	4080	4672	5600	6240
Heating Surface	Sq. Ft.	65	73	79	92	100	123	140	150	172	208	230
Furnace Volume—Less Base.	Cu. Ft.	11.0	11.8	12.5	14.1	15.1	16.5	17.7	18.3	21.7	425	27.9
Gross Base Volume	Cu. Ft.	7.8	8.5	9.1	10.3	11.1	11.4	12.3	12.7	14.0	16.6	17.9

THE FOLLOWING TABLE APPLIES TO COAL, OIL, GAS, OR STOKER-FIRING

Length of Firebox—Inside	In.	32¼	35¼	38¼	44¼	48¼	44¼	48¼	50¼	56¼	68¼	74¼
Width of Firebox—Inside	In.	23¼	23¼	23¼	23¼	23¼	26¼	26¼	26¼	26¼	26¼	26¼
Height of Firebox	In.	21	21	21	21	21	21	21	21	23	23	23
A—Width	In.	26⅝	26⅝	26⅝	26⅝	26⅝	29⅝	29⅝	29⅝	29⅝	29⅝	29⅝
B—Length	In.	48¾	51¾	54¾	60¾	64¾	61¾	65¾	67¾	73¾	85¾	91¾
C—Height	In.	59¼	59¼	59¼	59¼	59¼	66¾	66¾	66¾	68¾	68¾	68¾
D—Water Line	In.	51¼	51¼	51¼	51¼	51¼	58¾	58¾	58¾	60¾	60¾	60¾
E—Hgt. & End Brchg. Con. & Combus.	In.	46⅞	46⅞	46⅞	46⅞	46⅞	52¼	52¼	52¼	54¼	54¼	54¼
FxG—Size Breeching Connection	In.	8x17¼	8x17¼	8x17¼	8x17¼	8x17¼	9x23	9x23	9x23	9x23	9x23	9x23
H—Height Top Breeching Connection	In.	52	52	52	52	52	59½	59½	59½	61½	61½	61½
K—Top Breeching Connection	In.	7	7	7	7	7	7½	7½	7½	7½	7½	7½
L—Length Bare Boiler	In.	36½	39½	42½	48½	52½	48½	52½	54½	60½	72½	78½
M—Length Smoke Box	In.	12¼	12¼	12¼	12¼	12¼	13¼	13¼	13¼	13¼	13¼	13¼
N—Location Supply Opening	In.	18	20	21	24	26	24	26	27	30	36	40
Q—Height Return Opening	In.	16¼	16¼	16¼	16¼	16¼	17	17	17	17	17	17
R—Width of Base	In.	29⅝	29⅝	29⅝	29⅝	29⅝	32⅝	32⅝	32⅝	32⅝	32⅝	32⅝
S—Length of Base	In.	39½	42½	45½	51½	55½	51½	55½	57½	63½	75½	81½
Size Supply Opening	In.	4	4	4	5	5	5	5	5	5	6	6
Size Return Opening	In.	4	4	4	5	5	5	5	5	5	6	6
Diameter Stack	In.	12	12	12	12	12	16	16	16	16	18	18
Height Stack	Ft.	35	35	35	35	35	40	40	40	40	55	55
Diameter Breeching	In.	14	14	14	14	14	18	18	18	18	20	20
Approx. Covering—Unjacketed Boilers	Sq. Ft.	39	41	43	48	50	54	58	60	67	78	83
Approx. Weight—Unjacketed Boilers	Lbs.	1790	1875	1960	2140	2200	2445	2590	2700	3025	3455	3745

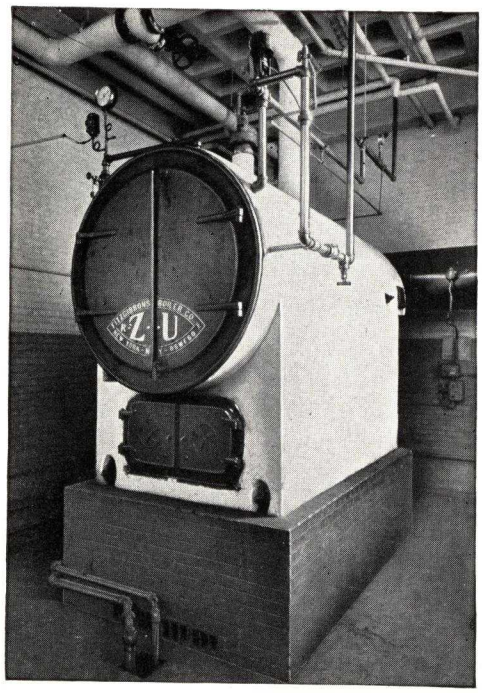




RATINGS—Ratings are the total radiation loads (taken at the boiler outlet) which the respective boilers will heat, with 2 lbs. pressure at the boiler for Steam and 180° F. for Hot Water.

Ratings are expressed in square feet of equivalent cast-iron radiation, emitting 240 B.t.u. per sq. ft. per hour for Steam, and 150 B.t.u. per sq. ft. per hour for Hot Water.

Boiler ratings quoted do not provide for hot water supply, additional capacity must be figured.



FITZGIBBONS R-Z-U FIRE BOX BOILERS

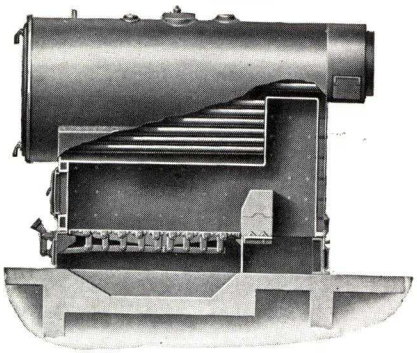
For Superior Heating Service—With Any Fuel—In Any Type of Heating System

The Fitzgibbons R-Z-U Boiler is specially adapted to space conditions where a rear smoke outlet is required. Such characteristics as all-welded steel construction cylindrical shell, quick steaming, thorough combustion, long flue travel, high efficiency of heat transfer and remarkable fuel economies have won for the R-Z-U a wide reputation as possessing every qualification for superior heating service with any fuel in any heating system.

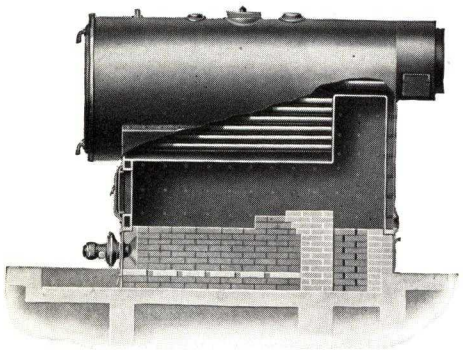
Combustion—As proportioned for the burning of various fuels, the dimensions of the R-Z-U firebox provide that area and form which insure complete burning of every particle of combustible gas.

For the burning of coal or coke, the grates are designed to freely admit adequate primary air, while the intake of secondary air provides the proper quantity of oxygen over the top of the fire bed to force the fuel to give up every available unit of its latent heat. The secondary air stream drawn into the fire-box is mingled with a swirling rush of hot gases arising from the fire bed, directed to some extent by the form of the combustion chamber. This mixture immediately becomes heated to the point where complete combustion can take place with the consequent release of additional heat units. The secondary air stream and gas mixture is drawn over the entire length of the fire bed and in the course of the long journey, cannot fail to perform its function.

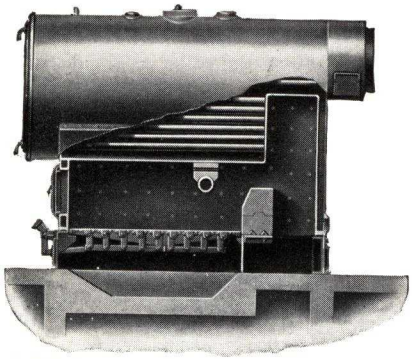
In stoker firing, the form and area of the R-Z-U combustion chamber again lends itself to best possible efficiency, while for oil or gas firing it achieves practically ideal conditions.



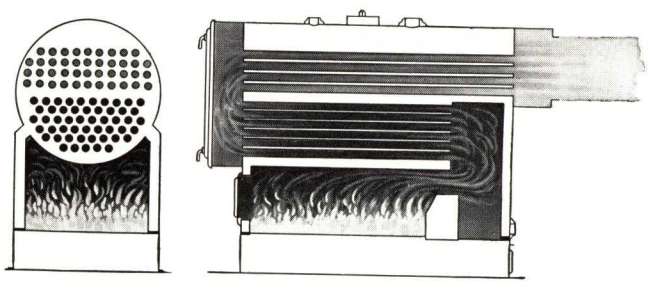
R-Z-U for Hard Coal



R-Z-U for Oil or Gas



R-Z-U Smokeless-Bituminous



A graphic illustration of the long, "back-and-forth" gas travel, characteristic of the R-Z-U Boiler. Notice, in the end views, how the R-Z-U crown sheet naturally distributes heat over the entire width of the boiler.

Water Circulation—The design of the R-Z-U sets up a THERMO-SYPHONIC circulation of water—a progressive movement so rapid and so positive that it provides a scrubbing action that brushes the bubbles of steam from the fire tubes, thus promoting rapid steaming and retarding settlement of sediment anywhere but at the lowest levels of the water walls, from which it can be readily removed through openings provided.

Crown sheet construction is not only conducive to free and rapid water circulation, but also exposes a large surface area together with the water walls to the direct action of radiant heat. Further, it causes the gases to mushroom out to the sides, throwing its heat into the water walls as well as directly upward in the center of the boiler. Thus, the water is heated uniformly throughout the entire width of the boiler.

Long flue travel and many tubes give full and adequate heat transfer surface.

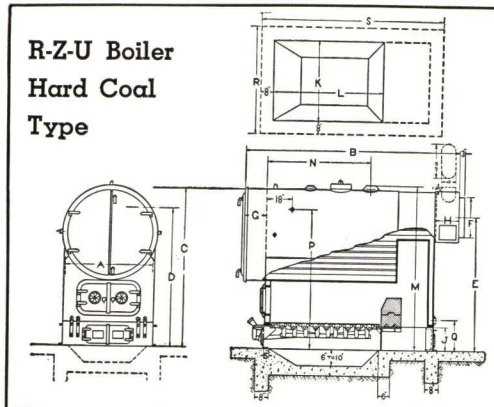
Grates—These are of selected, clean gray iron, machined to accurate fit, and sections of the same type are interchangeable, easy to dismount and replace. The rocking grate is standard for commercial sizes of anthracite, bituminous, and for coke. For smaller sizes of anthracite, the dumping grate can be obtained.

R-Z-U Smokeless Boiler

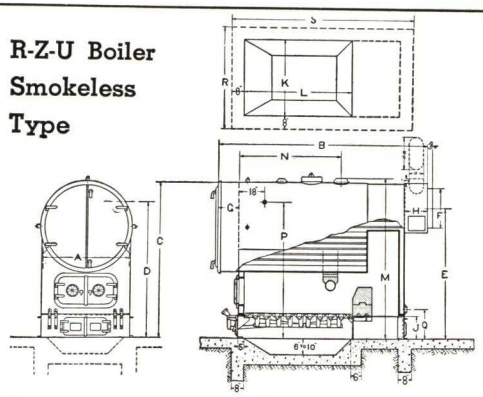
To burn bituminous coal smokelessly, the prime essential is the proper admixture of secondary air. The success of the R-Z-U Smokeless Boiler in this respect is due to the position and form of the baffle shown in the illustration below. This baffle causes turbulence in the action of the hot gases, which thus become thoroughly mixed with the secondary air drawn into the firebox. This mixture passes over and through the bed of live fire, causing carbon in suspension—the cause of smoke—to be completely consumed.

This baffle can be readily removed, adapting the boiler to new fuels.

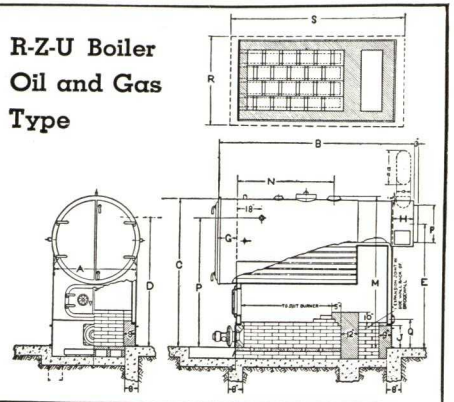
R-Z-U Boiler Hard Coal Type



R-Z-U Boiler Smokeless Type



R-Z-U Boiler Oil and Gas Type



R-Z-U BOILER — HARD COAL TYPE

Boiler Number	RD18	RD22	RD26	RD30	RD35	RD40	RD45	RD50	RD60	RD70	RD85	RD100	RD125	RD150	RD175	RD200	RD250	RD300	RD350
S.H.B.I. Steam Rating....Sq. Ft.	1800	2200	2600	3000	3500	4000	4500	5000	6000	7000	8500	10000	12500	15000	17500	20000	25000	30000	35000
S.H.B.I. Hot Water Rating....Sq. Ft.	2880	3520	4160	4800	5600	6400	7200	8000	9600	11200	13600	16000	20000	24000	28000	32000	40000	48000	56000
Heating Surface....Sq. Ft.	129	158	186	215	250	286	322	358	429	500	608	715	893	1072	1250	1429	1786	2143	2500
Grate Area....Sq. Ft.	7.9	8.9	9.7	10.5	11.4	12.2	13.4	14.5	16.4	18.1	20.5	22.5	25.6	28.4	30.9	33.2	37.4	41.2	44.7
A—Width (Inside Diam. of Shell)....In.	30	30	36	36	36	36	42	42	48	48	54	54	60	60	66	72	78	84	84
B—Length Boiler....In.	75¼	87¼	77¼	87¼	95¼	105¼	95¼	102¼	98¼	109¼	109¼	123¼	127¼	146¼	149¼	145¼	152¼	155¼	174¼
C—Height....In.	66	66	72	72	72	72	81¼	81¼	87⅜	87⅜	93⅜	93⅜	102⅜	102⅜	111⅜	117⅜	123⅜	129½	129½
D—Water Line....In.	58	58	64	64	64	64	72¼	72¼	76⅜	76⅜	81⅜	81⅜	89⅜	89⅜	97⅜	102⅜	106⅜	111½	111½
E—Floor to C. L. Rear Smoke Outlet....In.	57	57	62	62	62	62	70	70	72	72	78	78	85	85	93	97	102	105	105
F—Diam. Rear Smoke Outlet....In.	16	16	20	20	20	20	22	22	26	26	28	28	30	30	32	34	36	40	40
M—Height Steam Opening....In.	67½	67½	73½	73½	73½	73½	82¾	82¾	89	89	95	95	104	104	113	119	125½	131½	131½
R—Width of Foundation....In.	39	39	45	45	45	45	51	51	57	57	63	63	69	69	75	81	87	93	93
S—Length of Foundation....In.	63	75	63	73	81	91	80	87	83	94	92	106	106	125	125	120	127	128	147

No Bridgewall Furnished on the Following Size Boilers: RD-18, RD-22, RD-26, RD-30, RD-35, RD-45, RD-50, RD-60.

R-Z-U BOILER — SMOKELESS TYPE

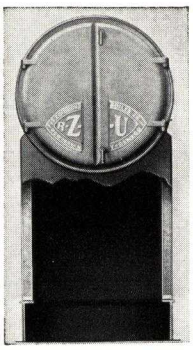
Boiler Number	RV18	RV22	RV26	RV30	RV35	RV40	RV45	RV50	RV60	RV70	RV85	RV100	RV125	RV150	RV175	RV200	RV250	RV300	RV350
S.H.B.I. Steam Rating....Sq. Ft.	1800	2200	2600	3000	3500	4000	4500	5000	6000	7000	8500	10000	12500	15000	17500	20000	25000	30000	35000
S.H.B.I. Hot Water Rating....Sq. Ft.	2880	3520	4160	4800	5600	6400	7200	8000	9600	11200	13600	16000	20000	24000	28000	32000	40000	48000	56000
Heating Surface....Sq. Ft.	129	158	186	215	250	286	322	358	429	500	608	715	893	1072	1250	1429	1786	2143	2500
Grate Area....Sq. Ft.	7.9	8.9	9.7	10.5	11.4	12.2	13.4	14.5	16.4	18.1	20.5	22.5	25.6	28.4	30.9	33.2	37.4	41.2	44.7
A—Width (Inside Diam. of Shell)....In.	30	30	36	36	36	36	42	42	48	48	54	54	60	60	66	72	78	84	84
B—Length Boiler....In.	75¼	87¼	77¼	87¼	95¼	105¼	95¼	102¼	98¼	109¼	109¼	123 ¼	127¼	146¼	149¼	145¼	152¼	155¼	174¼
C—Height....In.	66	66	72	72	72	72	81¼	81¼	87⅜	87⅜	93⅜	93⅜	102⅜	102⅜	111⅜	117⅜	123⅜	129½	129½
D—Water Line....In.	58	58	64	64	64	64	72¼	72¼	76⅜	76⅜	81⅜	81⅜	89⅜	89⅜	97⅜	102⅜	106⅜	111½	111½
E—Floor to C. L. Rear Smoke Outlet....In.	57	57	62	62	62	62	70	70	72	72	78	78	85	85	93	97	102	105	105
F—Diam. Rear Smoke Outlet....In.	16	16	20	20	20	20	22	22	26	26	28	28	30	30	32	34	36	40	40
M—Height Steam Opening....In.	67½	67½	73½	73½	73½	73½	82¾	82¾	89	89	95	95	104	104	113	119	125½	131½	131½
R—Width of Foundation....In.	39	39	45	45	45	45	51	51	57	57	63	63	69	69	75	81	87	93	93
S—Length of Foundation....In.	63	75	63	73	81	91	80	87	83	94	92	106	106	125	125	120	127	128	147

No Bridgewall Furnished on the Following Size Boilers: RV-18, RV-22, RV-26, RV-30, RV-35, RV-45, RV-50, RV-60.

R-Z-U BOILER — OIL, GAS AND STOKER TYPE

Boiler Number	RM21	RM27	RM31	RM36	RM42	RM48	RM54	RM61	RM72	RM86	RM103	RM121	RM151	RM182	RM212	RM242	RM303	RM364	RM425
S.H.B.I. Steam Rating....Sq. Ft.	2190	2680	3160	3650	4250	4860	5470	6080	7290	8500	10330	12150	15180	18220	21250	24290	30360	36430	42500
S.H.B.I. Hot Water Rating....Sq. Ft.	3500	4280	5050	5840	6800	7770	8750	9720	11660	13600	16520	19440	24280	29150	34000	38860	48570	58280	68000
Heating Surface....Sq. Ft.	129	158	186	215	250	286	322	358	429	500	608	715	893	1072	1250	1429	1786	2143	2500
A—Width (Inside Diam. of Shell)....In.	30	30	36	36	36	36	42	42	48	48	54	54	60	60	66	72	78	84	84
B—Length Boiler....In.	75¼	87¼	77¼	87¼	95¼	105¼	95¼	102¼	98	109¼	109¼	123¼	127¼	146¼	149¼	145¼	152¼	155¼	174¼
C—Height....In.	66	66	72	72	72	72	81¼	81¼	87⅜	87⅜	93⅜	93⅜	102⅜	102⅜	111⅜	117⅜	123⅜	129½	129½
D—Water Line....In.	58	58	64	64	64	64	72¼	72¼	76⅜	76⅜	81⅜	81⅜	89⅜	89⅜	97⅜	102⅜	106⅜	111½	111½
E—Floor to C. L. Rear Smoke Outlet....In.	57	57	62	62	62	62	70	70	72	72	78	78	85	85	93	97	102	105	105
F—Diam. Rear Smoke Outlet....In.	16	16	20	20	20	20	22	22	26	26	28	28	30	30	32	34	36	40	40
M—Height Steam Opening....In.	67½	67½	73½	73½	73½	73½	82¾	82¾	89	89	95	95	104	104	113	119	125½	131½	131½
R—Width of Foundation....In.	39	39	45	45	45	45	51	51	57	57	63	63	69	69	75	81	87	93	93
S—Length of Foundation....In.	63	75	63	73	81	91	80	87	83	94	92	106	106	125	125	120	127	128	147

FITZGIBBONS STEEL BOILERS



R-Z-U
High Furnace
Boiler

R-Z-U High Furnace Boiler—Stoker Type

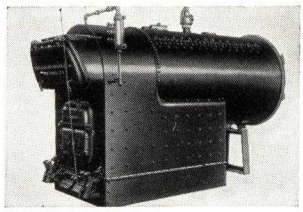
Boiler Number	S-21	S-26	S-31	S-36	S-42	S-48	S-54	S-60	S-72	S-85	S-103	S-121	S-151	S-182	S-212	S-242	S-303	S-364	S-425
S. H. B. I. Steam Rating ....Sq. Ft.	2190	2680	3160	3650	4250	4860	5470	6080	7290	8500	10330	12150	15180	18220	21250	24290	30360	36430	42500
S. H. B. I. Hot Water Rating ....Sq. Ft.	3500	4280	5050	5840	6800	7770	8750	9720	11660	13600	16520	19440	24280	29150	34000	38860	48570	58280	68000
Width (Inside Dia. Shell) ....In.	30	30	36	36	36	36	42	42	42	48	54	54	60	60	66	66	72	78	84
Length Boiler ....In.	73¼	84¼	73¼	81¼	90¼	98¼	91¼	98¼	113¼	105¼	106¾	119¼	121¼	139¼	143¼	158¼	165¼	167¼	166¼
Height ....In.	74¼	76¼	83	84	86	87	93¼	94¼	95¼	100⅜	109⅜	114⅜	126⅜	128⅜	137⅜	141⅛	152⅜	172⅜	184½
Approx. Shpg. Wt. Lbs.	2800	3200	3300	3400	4000	4500	5000	5600	6100	6800	8100	9300	10800	12600	16700	18500	19700	23400	28000

Standard Equipment included with each Boiler; Steel Base; Flue Brush and Rod; Steam Gauge; Water Column with Water Gauge and Compression Tri Cocks; Safety Valve. No trimmings furnished for Hot Water Boilers.

Z-U Firebox Boilers—Updraft Type

Boiler Number	D18	D22	D26	D30	D35	D40	D45	D50	D60	D70	D85	D100	D125	D150	D175	D200	D250	D300	D350
S.H.B.I. Steam Rating Sq. Ft.	1800	2200	2600	3000	3500	4000	4500	5000	6000	7000	8500	10000	12500	15000	17500	20000	25000	30000	35000
S.H.B.I. Hot Water Rating ....Sq. Ft.	2880	3520	4160	4800	5600	6400	7200	8000	9600	11200	13600	16000	20000	24000	28000	32000	40000	48000	56000
Heating Surface....Sq. Ft.	129	158	186	215	250	286	322	358	429	500	608	715	893	1072	1250	1429	1786	2143	2500
Grate Area....Sq. Ft.	7.9	8.9	9.7	10.5	11.4	12.2	13.4	14.5	16.4	18.1	20.5	22.5	25.6	28.4	30.9	33.2	37.4	41.2	44.7
Width (Inside Dia. Shell)....In.	30	30	36	36	36	36	42	42	48	48	54	54	60	60	66	72	78	84	84
Length Boiler ....Ft.-In.	5–7¼	6–9¼	5–7¼	6–4¼	7–3¼	8–2¼	7–7¼	8–3¼	7–9¼	8–10¼	8–9¼	10–0¼	10–2¼	11–10¼	11–11¼	11–6¼	12–2¼	12–4¼	14–0¼
Height....In.	62	62	68	68	68	68	72½	72½	80½	80½	86½	86½	95½	95½	103½	111½	117½	123½	123½
Approx. Shipping Wt....Lbs.	2600	2900	3200	3400	3600	4000	4800	5100	6300	7200	8100	9100	10800	11900	14700	16700	18900	22900	25500

Standard Equipment with Each Boiler for Coal Burning; Steel Base; Rear Stand; Rocking Grates; Fire Tools Consisting of Hoe, Poker, Slice Bar, Flue Brush and Rod; Steam Gauge; Water Column with Water Gauge and Compression Tricocks; Safety Valve and Damper Regulator. No trimmings furnished for Hot Water Boilers.

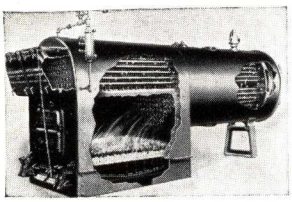


Z-U Boilers

Standard Equipment

Included with each boiler; steel base; flue brush and rod; steam gauge; water column including water gauge, glass and gauge cocks; and safety valve.

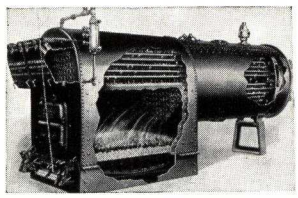
No trimmings furnished for Hot Water Boilers.



500 Series Boilers

500 Series Welded Return Tubular Firebox Boiler—15 Lbs. W.S.P.—A.S.M.E.Code

Boiler Number	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589
S.H.B.I. Steam Rating Sq. Ft.	3500	4000	4500	5000	6000	7000	8500	10000	12500	15000	17500	20000	25000	30000	35000
S.H.B.I. Water Rating Sq. Ft.	5600	6400	7200	8000	9600	11200	13600	16000	20000	24000	28000	32000	40000	48000	56000
Diameter of Boiler....In.	42	42	42	48	48	48	54	54	60	60	66	66	72	78	78
Length of Boiler ....Ft.-In.	7–7	8–4	9–4	7–10	9–1	10–4	10–8	12–2	12–1	14–1	14–3	15–11	16–4	16–9	19–1
Heating Surface ....Sq. Ft.	250	286	322	358	429	500	608	715	893	1072	1250	1429	1786	2143	2500
Ht. overall from floor line..In.	71	71	71	77	77	77	83	83	92	92	100	100	106	112	112
Approx. Shipping Wt....Lbs.	4900	5100	5600	6300	6900	8100	8700	9800	11800	13100	14000	17500	20800	23800	26200



700 Series Boilers

700 Series Riveted Return Tubular Firebox Boilers—15 Lbs. W.S.P.—A.S.M.E.Code

With 3" Direct and 3" Return Tubes

Boiler Number	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715
S.H.B.I. Steam Rating Sq. Ft.	3500	4000	4500	5000	6000	7000	8500	10000	12500	15000	17500	20000	25000	30000	35000
S.H.B.I. Water Rating Sq. Ft.	5600	6400	7200	8000	9600	11200	13600	16000	20000	24000	28000	32000	40000	48000	56000
Diameter of Boiler....In.	42	42	42	48	48	54	54	60	60	66	66	72	78	84	84
Length of Boiler ....Ft.-In.	8–0	8–10	9–10	8–4	9–8	10–1	10–9	10–9	12–2	12–10	14–6	13–7	14–7	14–9	16–8
Ht. overall from floor line...In.	74	74	74	80	80	86	86	95	95	103	103	109	115	121	121
Approx. Shipping Wt. ..Lbs.	6000	6500	7000	7900	8600	8800	10800	12400	14700	17300	19400	20200	23800	26900	32400

Built with 4" Direct and 3" Return Tubes

Boiler Number	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730
S.H.B.I. Steam Rating Sq. Ft.	3500	4000	4500	5000	6000	7000	8500	10000	12500	15000	17500	20000	25000	30000	35000
S.H.B.I. Water Rating Sq. Ft.	5600	6400	7200	8000	9600	11200	13600	16000	20000	24000	28000	32000	40000	48000	56000
Diameter of Boiler....In.	42	42	42	48	48	54	54	60	60	66	66	72	78	84	84
Length of Boiler ....Ft.-In.	8–6	9–6	10–7	8–9	10–2	10–2	11–5	10–10	12–10	13–2	15–0	14–0	15–1	15–4	17–5
Ht. overall from floor line...In.	74	74	74	80	80	86	86	95	95	103	103	109	115	121	121
Approx. Shipping Wt....Lbs.	6100	6600	7100	8000	8800	9000	11000	12600	15000	17700	19900	20700	24500	27700	30500

Built with 4" Direct and 4" Return Tubes

Boiler Number	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745
S.H.B.I. Steam Rating Sq. Ft.	3500	4000	4500	5000	6000	7000	8500	10000	12500	15000	17500	20000	25000	30000	35000
S.H.B.I. Water Rating Sq. Ft.	5600	6400	7200	8000	9600	11200	13600	16000	20000	24000	28000	32000	40000	48000	56000
Diameter of Boiler....In.	42	42	42	48	48	54	54	60	60	66	66	72	78	84	84
Length of Boiler ....Ft.-In.	9–8	10–9	12–0	9–11	11–8	10–8	12–6	11–9	14–4	14–4	16–4	15–7	16–3	17–4	19–8
Ht. overall from floor line...In.	74	74	74	80	80	86	86	95	95	103	103	109	115	121	121
Approx. Shipping Wt....Lbs.	6400	7000	7500	8400	9400	9400	11600	13200	15900	18700	21000	22100	26000	29800	32900

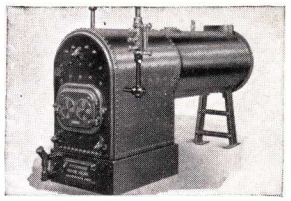
Standard Equipment with Each Boiler for Coal Burning; Steel Base; Rear Stand; Rocking Grates; Fire Tools Consisting of Hoe, Poker, Slice Bar, Flue Brush and Rod; Steam Gauge; Water Column with Water Gauge and Compression Tricocks; Safety Valve and Damper Regulator. No Trimmings Furnished for Hot Water Boilers.

FITZGIBBONS STEEL BOILERS

F Series Riveted Firebox Boilers—100 Lbs. W.S.P.; A.S.M.E. Code

Boiler Number	F-13	F-16	F-19	F-22	F-25	F-29	F-32	F-36	F-43	F-50	F-61	F-72	F-89	F-107
Rated Horsepower	13	16	19	22	25	29	32	36	43	50	61	72	89	107
S. H. B. I. Steam Rating....Sq. Ft.	1800	2200	2600	3000	3500	4000	4500	5000	6000	7000	8500	10000	12500	15000
Diameter of Boiler.....In.	36	36	36	42	42	48	48	48	54	54	60	60	66	66
Length of Boiler.....Ft.-In.	8–9	10–4	11–9	10–1	11–6	10–10	12–1	12–11	11–8	13–3	13–3	15–1	15–4	18–1
Height Overall from Floor Line..In.	66	66	66	72	72	78	78	78	84	84	91	94	100	100
Approx. Shipping Weight.....Lbs.	4500	5500	6000	6500	7500	8000	9000	9500	11000	12500	14800	17000	20800	24500

Standard Equipment with Each Boiler for Coal Burning; Steel Base, Rear Stand, Rocking Grates; Fire Tools Consisting of Hoe, Poker, Slice Bar; Flue Brush and Rod; Steam Gauge, Water Column with Water Gauge and Compression Tri-cocks and Safety Valve.



"F" Series Boilers

P Series Riveted Return Tubular Firebox Boilers—100 Lbs. W.S.P.; A.S.M.E. Code

Built with 3" Direct and 3" Return Tubes

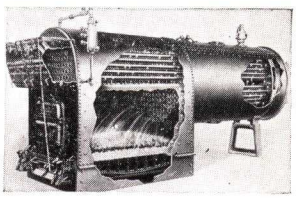
Boiler Number	P-25	P-29	P-32	P-36	P-43	P-50	P-61	P-72	P-89	P-107	P-125	P-143	P-179	P-214	P-250
Rated Horsepower	25	29	32	36	43	50	61	72	89	107	125	143	179	214	250
S.H.B.I. Steam Rating..Sq. Ft.	3500	4000	4500	5000	6000	7000	8500	10000	12500	15000	17500	20000	25000	30000	35000
Diameter of Boiler.....In.	42	42	42	48	48	54	54	60	60	66	66	72	78	84	84
Length of Boiler.....Ft.-In.	7–10	8–10	9–10	8–6	9–11	10–6	11–3	11–6	13–11	13–2	15–0	13–9	15–1	15–6	17–6
Ht. Overall from Floor Line. In.	77	77	77	83	83	89	89	98	98	106	106	112	118	127	127
Approx. Shipping Wt.....Lbs.	7500	8000	9000	9500	11000	12000	14000	15500	18000	20500	22500	25000	29000	32500	36000

With 4" Direct and 3" Return Tubes

Boiler Number	P-25	P-29	P-32	P-36	P-43	P-50	P-61	P-72	P-89	P-107	P-125	P-143	P-179	P-214	P-250
Rated Horsepower	25	29	32	36	43	50	61	72	89	107	125	143	179	214	250
S.H.B.I. Steam Rating..Sq. Ft.	3500	4000	4500	5000	6000	7000	8500	10000	12500	15000	17500	20000	25000	30000	35000
Diameter of Boiler.....In.	42	42	42	48	48	54	54	60	60	66	66	72	78	84	84
Length of Boiler.....Ft.-In.	8–4	9–6	10–7	8–9	10–3	10–10	12–0	12–0	14–8	13–8	15–8	14–4	15–9	16–2	18–5
Ht. Overall from Floor Line.In.	77	77	77	83	83	89	89	98	98	106	106	112	118	127	127
Approx. Shipping Wt.....Lbs.	8000	8500	9500	10000	11500	13000	14500	16500	19000	21500	24000	26500	31000	35000	39000

With 4" Direct and 4" Return Tubes

Boiler Number	P-25	P-29	P-32	P-36	P-43	P-50	P-61	P-72	P-89	P-107	P-125	P-143	P-179	P-214	P-250
Rated Horsepower	25	29	32	36	43	50	61	72	89	107	125	143	179	214	250
S.H.B.I. Steam Rating..Sq. Ft.	3500	4000	4500	5000	6000	7000	8500	10000	12500	15000	17500	20000	25000	30000	35000
Diameter of Boiler.....In.	42	42	42	48	48	54	54	60	60	66	66	72	78	84	84
Length of Boiler.....Ft.-In.	9–9	11–1	12–4	10–3	12–0	11–7	13–9	13–9	16–9	15–1	17–2	16–2	18–0	19–0	21–8
Ht. Overall from Floor Line.In.	77	77	77	83	83	89	89	98	98	106	106	112	118	127	127
Approx. Shipping Wt.....Lbs.	8500	9000	10000	10500	12000	13500	15500	17000	20000	23000	25500	28500	33500	38000	42000



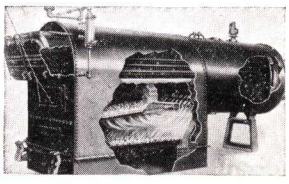
"P" Series Boilers

Standard Equipment with Each Boiler for Coal Burning; Steel Base; Rear Stand; Rocking Grates; Fire Tools Consisting of Hoe, Poker, Slice Bar; Flue Brush and Rod; Steam Gauge; Water Column with Water Gauge and Compression Tri-cocks and Safety Valve.

600 Series Riveted Return Tubular Firebox Boilers—15 Lbs. W.S.P.; A.S.M.E. Code

Boiler Number	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649
S.H.B.I. Steam Rating..Sq. Ft.	3500	4000	4500	5000	6000	7000	8500	10000	12500	15000	17500	20000	25000	30000	35000
S.H.B.I. Water Rating..Sq. Ft.	5600	6400	7200	8000	9600	11200	13600	16000	20000	24000	28000	32000	40000	48000	56000
Diameter of Boiler.....In.	42	42	42	48	48	54	54	60	60	66	66	72	78	84	84
Length of Boiler.....Ft.-In.	8–0	8–9	9–9	8–5	9–8	11–1	12–7	12–2	14–3	14–7	16–5	16–0	16–8	17–8	20–1
Heating Surface.....Sq. Ft.	250	286	322	358	429	500	608	715	893	1072	1250	1429	1786	2143	2500
Ht. Overall from Floor Line.In.	79	79	79	84	84	87	87	99	99	103	103	109	115	121	121
Approx. Shipping Wt.....Lbs.	6600	6900	7500	8300	9600	10800	11700	14400	16100	19500	21200	23400	27800	31800	38300

Standard Equipment with Each Boiler for Coal Burning; Steel Base, Rear Stand, Rocking Grates; Fire Tools Consisting of Hoe, Poker, Slice Bar; Flue Brush and Rod, Water Grate Scraper and Rod, Socket Wrench, Steam Gauge, Water Column with Water Gauge and Compression Tri-cocks, Safety Valve, Damper Regulator and Special Tile to Fit First Course of Header. No Trimming Furnished for Hot Water Boilers.



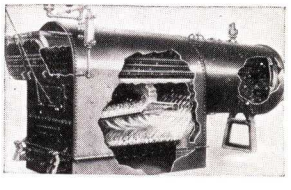
600 Series Boilers

635 to 639 Built with 3" Direct and 3" Return Tubes; 640 to 649 Built with 4" Direct and 4" Return Tubes.

800 Series Riveted Return Tubular Firebox Boilers—100 Lbs. W.S.P.; A.S.M.E. Code

Boiler Number	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849
Rated Horsepower	25	29	32	36	43	50	61	72	89	107	125	143	179	214	250
S.H.B.I. Steam Rating..Sq. Ft.	3500	4000	4500	5000	6000	7000	8500	10000	12500	15000	17500	20000	25000	30000	35000
Diameter of Boiler.....In.	42	42	42	48	48	54	54	60	60	66	66	72	78	84	84
Length of Boiler.....Ft.-In.	8–0	8–10	9–9	9–5	10–11	11–7	13–8	13–9	16–7	15–1	17–1	16–5	18–3	19–3	21–10
Heating Surface.....Sq. Ft.	250	286	322	358	429	500	608	715	893	1072	1250	1429	1786	2143	2500
Ht. Overall from Floor Line.In.	82	82	82	87	87	90	90	102	102	106	106	112	118	127	127
Approx. Shipping Wt.....Lbs.	7000	8000	8500	9000	10500	13000	15000	17000	20000	23000	25500	28000	33500	38500	43000

Standard Equipment with Each Boiler for Coal Burning; Steel Base, Rear Stand, Rocking Grates; Fire Tools Consisting of Hoe, Poker, Slice Bar; Flue Brush and Rod, Water Grate Scraper and Rod, Socket Wrench, Steam Gauge, Water Column with Water Gauge and Compression Tri-cocks, Safety Valve and Special Fire Tile to Fit Course of Header.



800 Series Boilers

835 to 839 Built with 3" Direct and 3" Return Tubes; 840 to 849 Built with 4" Direct and 4" Return Tubes.

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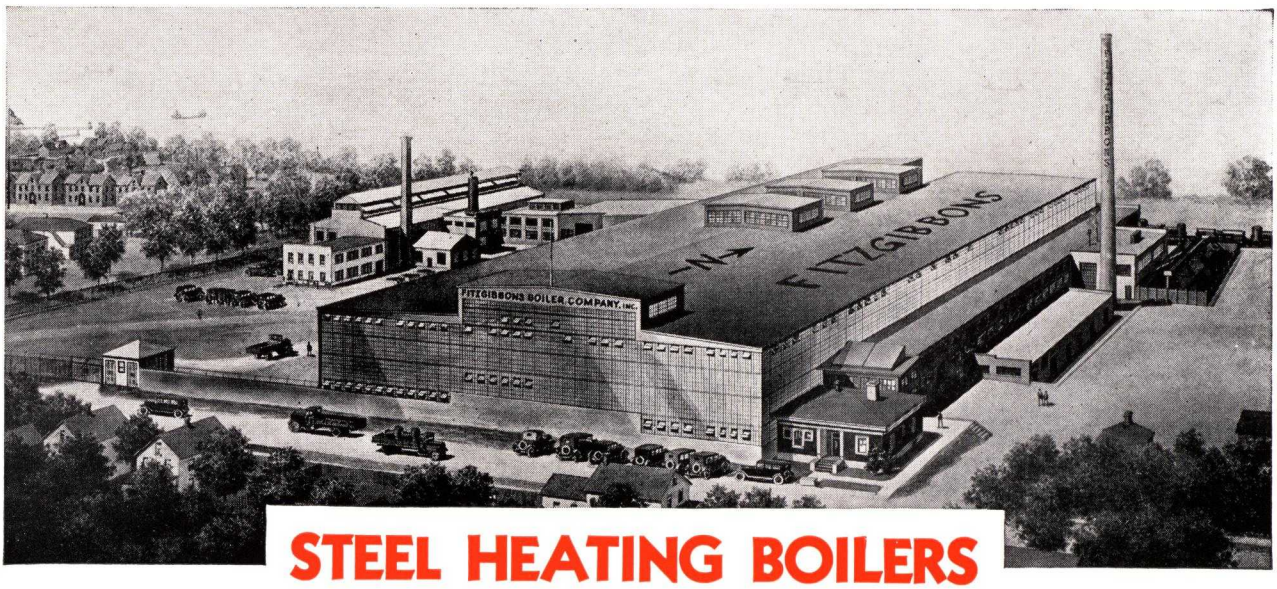

STEEL HEATING BOILERS

meet every heating need

If you have a heating project, residential, commercial or industrial, you will find in the FITZGIBBONS line *just the right boiler or air conditioner to meet the requirements.* This holds true for any size of project, for any kind of fuel and for any heating system, and applies equally to new projects and to modernization.

And the name "FITZGIBBONS" on the boiler or air-conditioner you select does more than indicate the maker. It means that the boiler embodies the experience, the refinements and the perfection of a half century of aggressive steel boiler manufacturing and progressive development. It is your guarantee of the same quality, the same high efficiency and the same operating economy that have satisfied thousands upon thousands of owners and have won and held the esteem of the entire heating profession.

FITZGIBBONS ENGINEERS

are always at your Service

We are always ready and glad to assist Owners, Architects, Heating Engineers, Contractors, Builders and Dealers in selecting the right type and size of boiler for any heating job and in working out specific boiler applications. Particularly where hot water service is involved we are confident we can be of real help. Our long and comprehensive experience in the heating field assures you of authoritative recommendations. Avail yourself of this cooperation without hesitation for it involves no obligation.

Fitzgibbons Boiler Company, Inc.

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Printed in U.S.A.

SECTION 26

CONTINUED ⟶

THE FOX FURNACE COMPANY

DIVISION OF AMERICAN RADIATOR & STANDARD SANITARY CORPORATION

ELYRIA, OHIO

SALES OFFICES

NEW YORK, N. Y., 40 West 40th Street — CLEVELAND, OHIO, 6505 Euclid Avenue — BOSTON, MASS., 240 Mt. Vernon Street, Dorchester — SAN FRANCISCO, CAL., 1123 Harrison Street

THE COMPANY AND ITS SERVICES

Sunbeam Air Conditioning equipment is distributed through several hundred jobbers, one of whom is located in every principal city in the country, and it is installed by thousands of heating, ventilating and sheet metal contractors.

SUNBEAM AIR CONDITIONING UNIT

A large staff of engineers is maintained at the factory to design air conditioning systems for architects. Engineering layouts, which are furnished, state the size of unit required. Also, layouts provide the size and location of all ducts, pipes, risers, registers and grilles. Installation specifications and illustrated instructions accompany each layout so that all details of installation will be handled in strict accordance with Sunbeam standards.

There is no charge for this service.

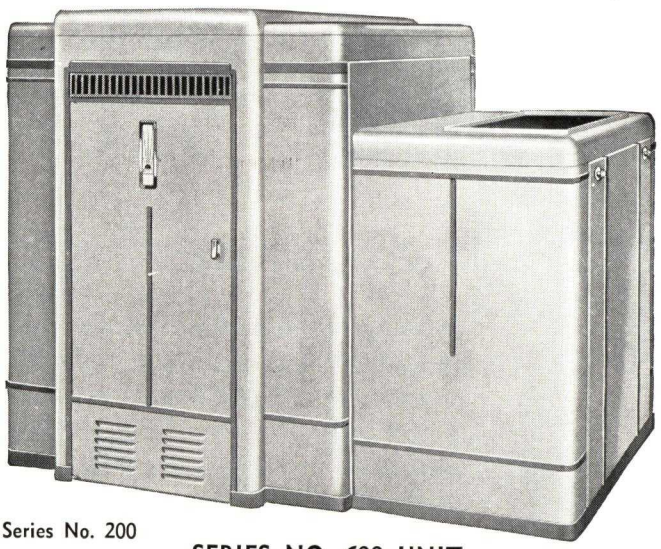
SUNBEAM OIL BURNING AIR CONDITIONING UNIT—SERIES NO. 200 AND NO. 600

The Series No. 200 and No. 600 Sunbeam Oil Burning Air Conditioning Unit represents a combination of equipment having unusually high efficiency, in a cabinet of beauty and attractiveness that has heretofore, we believe, never been attained.

Like the other Sunbeam units for gas and coal fuels shown herein, this Series has been designed to provide economically the many benefits of air conditioning for residences, small stores, schools or other buildings whose requirements are within the capacities of this equipment. The complete Unit provides air warmed to proper temperature and humidified to the proper degree in winter, cleaned and filtered of dust, pollen and other foreign matter, and circulated to provide healthful ventilation the year 'round. In addition, the Unit will furnish cooling ventilation in summer. Dehumidification and cooling of the air may be provided in summer by the addition of cooling equipment to the Unit.

These units are furnished completely equipped with necessary controls for regulating temperature and humidity. For description of blower, humidifier, filter, etc., refer to page 4.

The Nos. 200 and 600 Units are equipped with integral, co-ordinated oil burners, gun type. Both the No. 200 and No. 600 are, however, available without oil burner. Practically any gun type burner of the proper capacity can be accommodated.



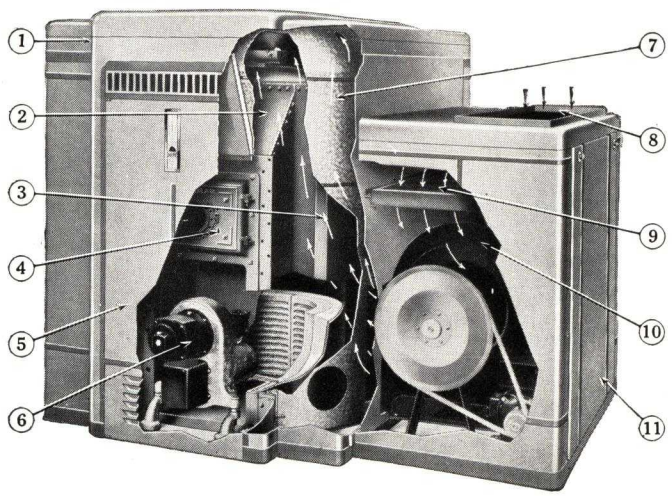
Series No. 200

SERIES NO. 200 UNIT

In this Unit, the oil burner is inserted in a space provided in the front of the cabinet as shown in the cutaway view. The advantage of this location is that the burner is readily accessible behind the cabinet door, but is entirely concealed. Air Conditioner and oil burner are perfectly co-ordinated, and provide high efficiency and economical fuel consumption.

SERIES NO. 600 UNIT

In the Series No. 600 Unit the front exterior appearance is similar to that of the Series No. 200 Unit. The oil burner is, however, installed in the rear of the heating element under the smoke pipe, out of the way, but is not enclosed in the cabinet. The space provided for the burner measures 41 in. wide, 23⅞ in. high, so that practically any gun type conversion oil burner can be accommodated.



1 Exterior Cabinet—Glossy, smooth green enamel baked on rigid, 20-gauge cold rolled furniture stock. Rounded corners, graceful proportions, the absence of bolts and screws, and contrasting trim of dark green, provide this Air Conditioner with an attractiveness of appearance that is unexcelled.

2 Heating Element—Constructed of No. 7 gauge boiler plate, riveted and welded to produce a gas-tight unit.

3 Radiator Section of Heating Element—Constructed of No. 12 gauge steel, where the heat from the products of combustion is thoroughly utilized before passing into flue.

4 Fire Door—To heating element with glass covered observation opening for observing combustion.

5 Access Door—Which conceals, and also gives easy access to, heating element and oil burner, Series No. 200.

6 Position of Oil Burner—In Series No. 200, oil burner connects to front of heating element. (In Series No. 600, oil burner connects to rear of heating element.)

7 Inner Casing—Galvanized iron. Part of the air from the blower circulates between the inner and outer casings to keep the exterior of cabinet cool.

8 Return Air Intake Opening—Return air duct system terminates at this inlet.

9 Air Filters—Foreign matter—dirt, dust, lint, germs, pollen—is removed by the filters as the air passes through them.

10 The Blower—High in efficiency and air moving capacity. Large, powerful and quiet. Is equipped with rubber mounted, self-aligning bearings, which require oiling only a few times a year.

11 Large, Tight Fitting Panel—Which gives easy access to filters, blower and motor.

CAPACITIES AND BLOWER, MOTOR, FILTER Specifications Series No. 200 and No. 600

No.	*Oil burner input, gal. per. hr.	Maximum B.t.u. cap. at reg.	Blower No.	Max. c.f.m. required at 65° F.	Approx. blower r.p.m. at ¼ in. s.p.	Diam. of blower wheel, in.	Motor hp.	Motor r.p.m.	Number filters, and size, in.
224	1.2	123,000	1–12	1218	482	12	¼	1725	3 (16x20)
224	1.5	155,000	1–15	1522	350	15	⅓	1725	3 (16x20)
224	1.7	176,000	1–15	1725	375	15	½	1725	3 (16x20)
224	1.8	186,000	1–15	1827	380	15	¾	1725	3 (16x20)
634	2.5	240,000	1–18	2550	311	18	½	1725	6 (20x20)
634	3.0	285,000	1–18	3050	314	18	¾	1725	6 (20x20)
634	3.5	331,000	1–21	3500	266	21	¾	1725	6 (20x20)

*Combustion rate of oil burner must conform to the heating requirements of the installation. Ratings based on oil having a calorific value of 140,000 B.t.u. per gallon. Minimum input of burner must not be less than 1 gal. per hour.

DIMENSIONS

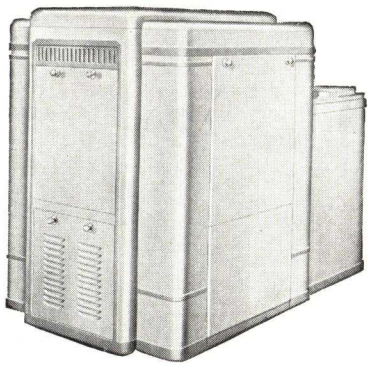
No.	*Overall width, in.	†Overall depth, in.	Height heating compartment, in.	Height blower compartment, in.	Air discharge opening, in.	Air intake opening, in.	Approx. distance from floor to center of flue outlet, in.	Flue vent size diam., in.
224	76¼	57⅞	58⅛	43¾	24x26	13x42	41 9/16	9
634	99 1/16	▲64 7/16	67	51¼	30x30	16x45½	49 5/16	10

*Allow 2 ft. at side of blower compartment for removal and replacement of filters. †Allow 2 ft. in front for opening of doors. ▲On No. 634 allow sufficient space in rear for installation of oil burner.

SUNBEAM OIL FIRED AIR CONDITIONING UNIT—SERIES No. 720-R

This Series is a high quality air conditioner designed for moderately priced houses. Capacities range from 50,000 to 100,000 B.t.u. at register per hour. It has a No. 8 gauge steel heating element, both riveted and welded, and is equipped with integral rotary oil burner completely mounted and assembled at the factory. Casings are attractively finished in green crystalline baked enamel. Over-all dimensions are: Width 64⅞ in. Depth 38 in. Height 60 in. *Write for catalogs.*

SUNBEAM GAS FIRED AIR CONDITIONING UNIT—SERIES "D"



Sunbeam Series "D"

This Unit provides all the advantages of air conditioning plus the desirable features of automatic gas firing.

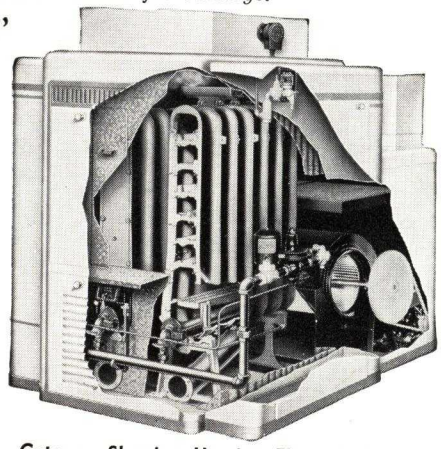
The cabinet is similar in design, construction and finish to the Series No. 200 described on preceding page.

This Unit, which is approved by the American Gas Association, has heating elements of cast iron, each made in two sections, the faces of which are specially packed to form a leak-proof joint.

The Series "D" comes completely equipped with necessary controls, valves, wiring, pipe and conduit for connection to gas, electricity and water lines.

Heavy construction, thermostatic pilots and the finest of controls enable it to measure up to the highest standards of safety.

For a description of blower, humidifier, filter, etc., refer to page 4.



Cutaway Showing Heating Element, Burner, Valves, Blower and Filter

RATINGS

No.	A.G.A. B.t.u. input per hr.	B.t.u. capacity at registers	Number of burners	Gas supply tapping, in.	Flue vent size diam., in.	Approx. distance from floor to center of flue outlet, in.	Approx. shipping weight, lbs.
D-2	140,000	107,100	2	1	7	61½	1923
D-3	210,000	160,650	3	1	8	62	2517
D-4	280,000	214,200	4	1¼	9	62½	3238
D-5	350,000	267,750	5	1¼	10	63	4037

BLOWER-MOTOR-FILTER SPECIFICATIONS

No.	Blower No.	Blower c.f.m. at 65° F.	Approx. blower r.p.m. at ¼ in. s.p.	Diameter of wheel, in.	Number blowers	Motor hp.	Motor r.p.m.	Number filters and size, in.
D-2	1-12	1016	401	12	1	¼	1725	2 (16x25)
D-3	1-15	1526	344	15	1	⅓	1725	3 (16x25)
D-4	1-18	2032	300	18	1	½	1725	4 (16x25)
D-5	2-15.	2540	344	15	2	¾	1725	4 (16x25)

DIMENSIONS

No.	Width of heating compartment, in.	Overall *depth, in.	Overall height, in.	Width of blower compartment, in.	Height of blower compartment, in.	Depth of blower compartment, in.	Air discharge opening, in.	Air intake opening, in.
D-2	44½	75⅜	58	39½	41⅞	28	16x22	12⅜x35¼
D-3	56	76⅜	58	48¼	41⅞	29	16x34	12⅜x44
D-4	70½	79⅝	58	65⅜	41⅞	32⅛	16x45	12⅜x59¼
D-5	82	76⅜	58	86	41⅞	29	16x56½	12⅜x70

*Allow clearance in rear equal to depth of blower compartment for removal and replacement of filters, blower and motor. Allow 24-in. clearance in front for removal of baffles.

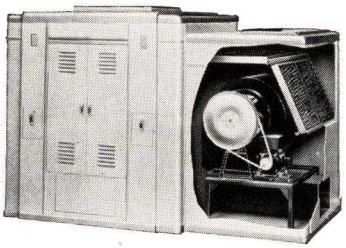
SUNBEAM GAS FIRED AIR CONDITIONING UNIT—SERIES "M"

This Unit is of modern design, has rounded corners, pleasing proportions, and is finished in green crystalline enamel. Heating elements are of steel. Its capacities—61,200 to 153,000 B.t.u. per hour at register—are adequate for small and average size homes. While it has operating and safety equipment similar to the Series D, and meets the high Sunbeam standard of quality and efficiency, it is substantially lower in price. Overall dimensions (depending on capacity) are: Width 32 in. to 48½ in. Depth 66⅞ in. to 73¾ in. Height 54 in. *Write for catalogs.*

SUNBEAM STOKER FIRED AIR CONDITIONING UNIT—SERIES "S"

The Sunbeam Series "S" is designed exclusively for stoker firing and possesses features that make coal burning nearly automatic. Either bin feed or hopper feed type of stoker can be installed from front, rear, either side, or below floor level through openings provided.

The heating element, constructed of No. 7 gauge boiler plate steel, has a large double radiator which will accommodate several months' accumulation of fly ash and still deliver its full rated capacity. When cleaning is necessary, it is conveniently accomplished through accessible openings provided.

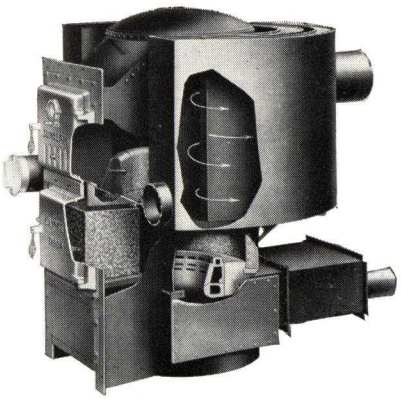


Interior View of Series "S" Showing Blower, Motor and Filters

The large fire door and sloping clinker disposal frame make it easy to reach every part of clinker. Clinkers are dropped into a clinker pan where they are left until they have cooled and odorous gases have passed up the flue.

Cabinets have graceful lines, pleasing proportions and are finished in two tones of smooth, glossy, green enamel. Their pleasing appearance will harmonize in the most attractively furnished basement.

For description of blower, filters, humidifiers, etc., refer to page 4.

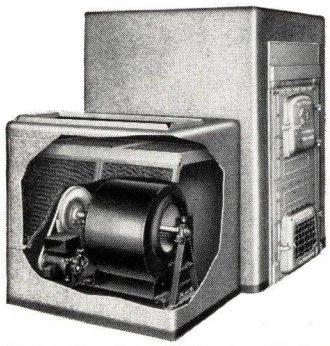


Heating Element of Series "S"

Showing double radiator, cleanout collars, fire door, clinker pan, clinker door, and housing for screw tube through which retort is inserted.

SUNBEAM COAL BURNING AIR CONDITIONING UNIT—SERIES NO. 80

This Air Conditioner is designed for burning coal, hand fired. High efficiency, long life and attractive appearance are noteworthy features. The heating element is made of No. 7 gauge boiler plate steel, riveted and welded to assure long life and gas-tight construction. A large amount of heating surface and long fire travel make this series remarkably efficient.

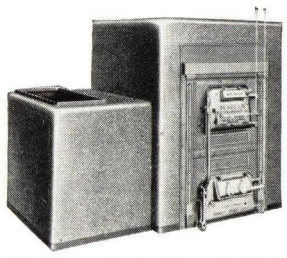


Series No. 80 Oil Burning Model Showing Blower, Motor and Filters

The handsome cabinets—with their graceful proportions, rounded corners and green crystalline enamel finish—offer, at a comparatively low price, outstandingly attractive appearance. Air-tight slip joints prevent heat from escaping into the basement.

Stoker Fired and Oil Burning Models—The Series No. 80 Sunbeam is also made in special Stoker Fired and in special Oil Fired models. Because of their design and construction these models are well adapted to automatic firing and operate at a high efficiency. Home owners who select this Series can change at any time from hand-firing to oil burning or stoker firing.

Equipment—All models can be furnished completely equipped with all necessary controls and wiring. For description of blower, filters, humidifiers, etc., refer to page 4.



Sunbeam Series No. 80 Coal Burning Model

CAPACITIES—BLOWER-MOTOR-FILTER SPECIFICATIONS—SERIES "S" AND SERIES NO. 80

No.	Coal Hand Fired		*Coal Stoker Fired		Oil Gun Type Burner		Oil Rotary Burner		Blower No.	Dia. of blower wheel, in.	Pitch dia. of blower pulley, in.	Number of blowers	Motor h.p.	Number filters, in.
	B. t. u. capacity at register	†C. f. m. required at 65° F.	B. t. u. capacity at register	†C. f. m. required at 65° F.	B. t. u. capacity at register	†C. f. m. required at 65° F.	B. t. u. capacity at register	†C. f. m. required at 65° F.						
24-S	.....	.....	150,000	1610	.....	.....	.....	.....	1–15	15	15	1	½	4(20x20)
27-S	.....	.....	200,000	2145	.....	.....	.....	.....	1–18	18	15	1	¾	5(16x25)
2280	103,000	1112	113,000	1210	117,000	1260	134,000	1441	1–12	12	12	1	¼	4(20x20)
2480	118,000	1269	129,000	1381	134,000	1439	153,000	1645	1–12	12	12	1	¼	4(20x20)
2780	155,000	1666	169,000	1814	176,000	1890	201,000	2160	1–15	15	15	1	⅓	4(20x20)
3080	182,000	1962	199,000	2136	207,000	2225	237,000	2543	1–18	18	15	1	½	5(16x25)
3480	222,000	2385	242,000	2596	252,000	2705	288,000	3091	1–21	21	15	1	¾	6(16x25)

†Air heated from 65° to 165° F. increases 19% in volume. Therefore, warm air ducts should have capacity for 19% greater c.f.m. than listed above.
*Combustion rate of stoker must conform to heating requirements of installation. Ratings based on coal having a calorific value of 12,000 B.t.u. per pound, and oil with a calorific value of 140,000 B.t.u. per gal.

DIMENSIONS SERIES "S" AND SERIES NO. 80

No.	▲Overall width in.	Height heating compartment, in.	Height blower compartment, in.	▲Width of blower compartment, in.	Overall *depth in.	Air discharge opening, in.	Air intake opening, in.	Smoke collar diameter, in.	Approximate distance from floor to center of smoke collar, in.
24-S	91 5/16	61½	55	34 1/16	58⅜	26x26	16¼x44 3/16	9	43¼
27-S	98 11/16	67	56½	36 11/16	63⅜	30x30	20⅜x50 5/16	9	44⅛
2280	73½	60	36¼	29½	43⅝	20x20	14 x36½	9	41¾
2480	75½	60	36¼	29½	46⅛	22x22	14 x36½	9	41¾
2780	82¾	67	41	33¾	51⅝	25x25	16 x45	10	43⅝
3080	91⅜	67	41	36⅜	54⅝	27x27	20 x51⅛	10	44¼
3480	101½	67	51¼	42½	58½	32x32	24 x55	10	45¼

*Smoke Pipe Tee extends out approximately 28 in. additional in Nos. 24-S, 27-S, 2280 and 2480, and 36 in. larger sizes.
▲Allow clearance at side equal to width of blower compartment for removal and replacement of filters, blower and motor.

SUNBEAM EQUIPMENT

All the different series of Sunbeam Air Conditioning Units shown on the preceding pages are furnished complete with the same types of equipment. These are briefly described below.

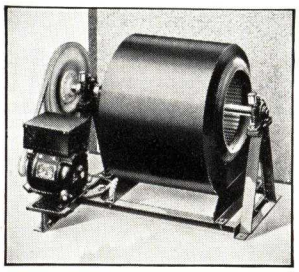
THE BLOWER

These blowers are large, powerful and silent. They operate at low speeds, consuming a minimum of current and move a large volume of air at low velocities and at comparatively low temperatures.

The blower and motor are securely mounted on an integral, rigid angle iron frame which prevents vibration and its possible resulting noise. Because of this integral base, pulleys are quickly and easily aligned and remain in alignment indefinitely.

Blowers and motors have extra capacity for summer cooling operation or to overcome greater than average resistance in the ducts. Blowers are equipped with rubber mounted, self-aligning bearings. Large oil reservoirs are provided.

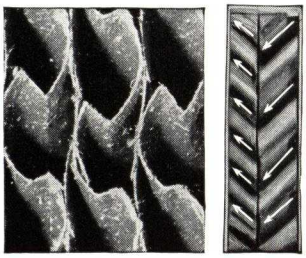
Motors, of the capacitor type, specially designed for air conditioning installations, are equipped with a special safety device to protect against damage from overloading. They do not cause radio interference.



Blower and Motor

AIR FILTERS

These filters combine the two desirable qualifications of high cleaning efficiency and long life. They offer comparatively little resistance to the circulating air after a period of service which finds many other types of filters completely clogged and in need of replacement. Their capacity to hold more dirt, dust, soot, lint, pollen and bacteria—and thus their longer life—is due to the "V" angle construction and to the fact that they can be treated with an unusually large amount of adhesive coating without filling up the passages through which the air must circulate. When clean filters are finally required, they can be obtained at the same low cost of ordinary filters.



Sunbeam Filter

Top view and side view showing "V" angle construction which assures uniform absorption of foreign matter.

CONTROLS

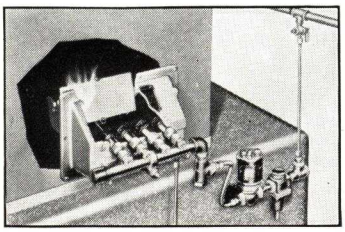
Each Sunbeam, whether for coal, oil or gas, is or can be equipped with a control system to provide regulation of temperature and humidity at practically any degree of sensitivity desired by the architect or owner. These controls also assure safety of operation of the various parts of the air conditioner.

SPRAY HUMIDIFIER

This new type of spray humidifier, automatically controlled by a room humidistat, has proven its ability to properly humidify the air even in those sections where salts, lime and "hard" water prevent functioning of other types of humidifiers. When one nozzle does clog, it is turned off and the next one turned on, until all nozzles are clogged. All nozzles are cleaned at one time—a simple operation requiring only a few minutes. Cleaning is necessary only a few times during a heating season. Amount of water atomized can be adjusted to the air's ability to absorb moisture—and thus prevent condensation in the plenum chamber—by changing the position of the atomizing plate.

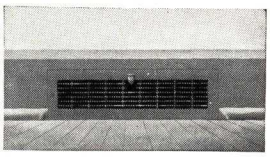
Humidistat

Solenoid valve, installed in water line and controlled by humidistat, is wired so that when humidistat calls for moisture the solenoid valve cannot open unless blower is running; blower cannot run unless heat is available in bonnet. Therefore, moisture is never introduced unless there is heat and air movement to absorb and carry away moisture. Humidistat is adjustable and can be set to maintain any desirable relative humidity.



Spray Humidifier equipped with nozzles; capacity-adjusting atomizing plate; pressure reducing valve; solenoid valve; 2 strainers; and pipe leading from aluminum pan to drain.

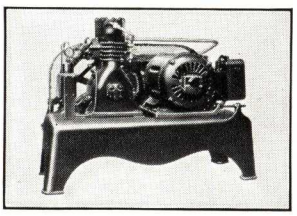
GRILLES



As the Sunbeam Air Conditioning System is based on the recirculation of air, discharge registers and recirculating grilles are required. Recirculating grilles are located in the baseboard. Supply registers are located in baseboard or in wall above the baseboard. All registers and grilles are relatively small and inconspicuous. They are so designed that they can be finished to harmonize with any decoration.

COOLING AND DEHUMIDIFYING UNIT

Where dehumidification and cooling are desired, the Sunbeam refrigerating unit with cooling coils can be installed in connection with the Sunbeam Winter Air Conditioning Unit. Or if cold water is available, it can be circulated through cooling coils. Duct system and registers can be designed and sized to carry warm, conditioned air in winter when heating plant is operating and also to distribute cool, conditioned air in summer when cooling plant is in operation.

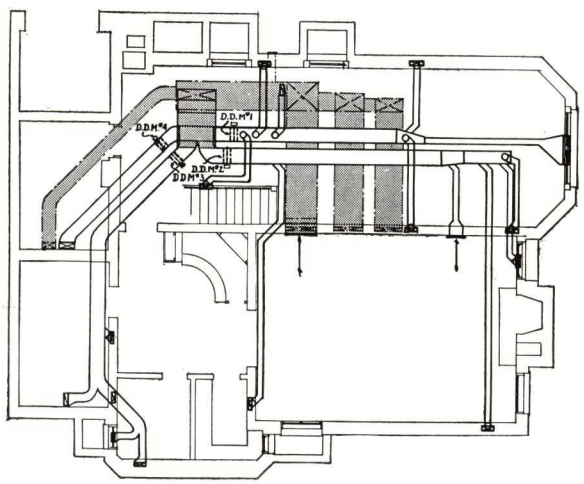


Refrigeration equipment may be installed when the Sunbeam Winter (heating) System is installed, or it can be added later.

ZONE CONTROL OF TEMPERATURE

In houses of many rooms or of the rambling type, it is difficult to maintain an even, uniform temperature in all rooms, whether the heating medium be air, water or steam, when entire building is controlled by only one thermostat. Zone Control overcomes this difficulty. The house is divided into zones. A thermostat is placed in one room in each zone. A trunk line or main duct with branches leads directly from Sunbeam Air Conditioning Unit to each zone. A damper, operated by a motor, is installed in each main duct. When a zone thermostat calls for heat, the duct damper motor opens damper in the duct which it controls, turns on the heat source and blower. When thermostat is satisfied it closes the damper it controls, turns off source of heat and blower. The heat source is "on" and blower is operating when any one zone thermostat is demanding heat.

Advantages of Zone Controls include besides uniform, even temperature in every room, quicker response and fuel economy because overheating is avoided. With Zone Control any desired temperature can be maintained in any zone.



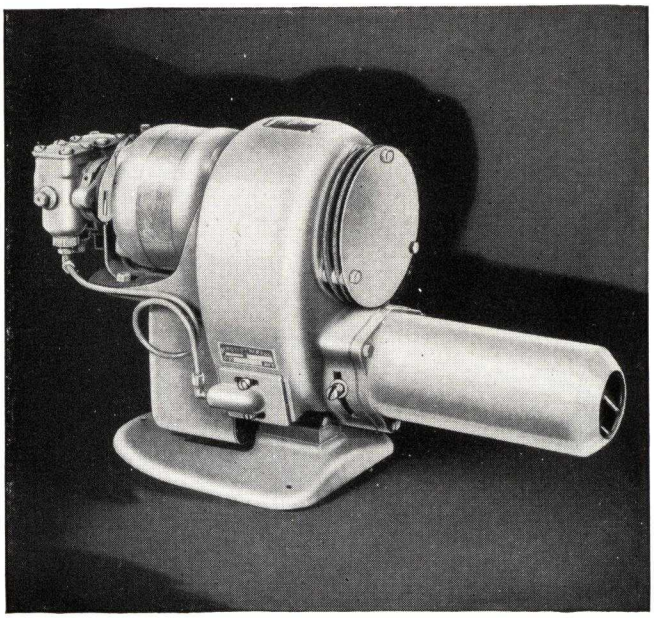
ESTABLISHED 1901

THE HEIL CO.

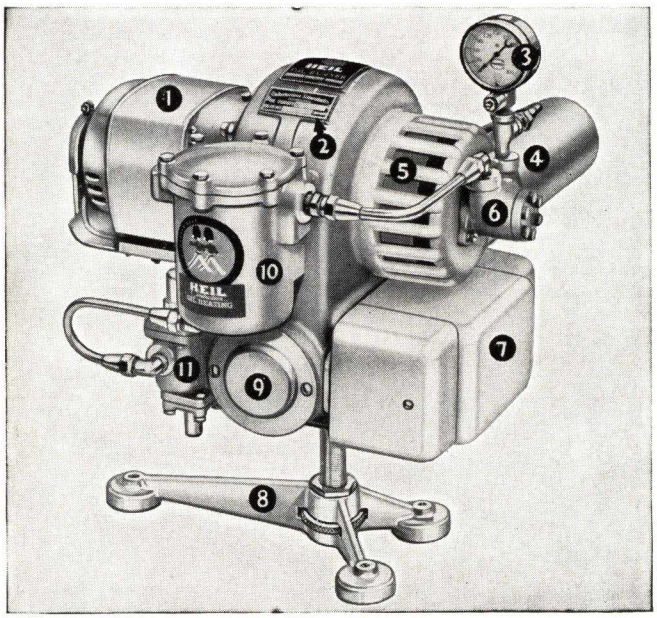
Conversion Oil Burners, Industrial Oil Burners, Furnace-Burner Units, Boiler-Burner Units, Air Conditioning Equipment, Water Systems

GENERAL OFFICES
3000 West Montana Street, MILWAUKEE, WIS.
FACTORIES: MILWAUKEE, WIS., HILLSIDE, N. J.

HEIL OIL HEATING EQUIPMENT — BUILT AND BACKED BY A PIONEER MANUFACTURER



Model X Heil Oil Burner
A compact, efficient oil burner priced for the competitive market



Model 1SS Heil Oil Burner

The numbers point out following features:

(1) Motor
(2) Underwriters label of approval
(3) Oil pressure gauge
(4) Firing tube
(5) Air intake
(6) Oil pump
(7) Transformer
(8) Adjustable base
(9) Removable inspection cover
(10) Heil oil filter
(11) Heil shut-off valve

Heil oil heating equipment has been developed from the original line of Combustion oil burners introduced to the trade in 1918. In 1929, THE HEIL Co. purchased the Combustion Oil Burner Co. and thus gave this pioneer oil burner line the benefit of modern production facilities, capable engineering assistance and sound financial backing. Since 1929 Heil Engineers have perfected and introduced a complete series of conversion oil burners for installation in any type of home heating plant—as well as efficient boiler-burner units—split systems and direct fired air conditioning units. This equipment is described briefly on these pages. The Heil dealer organization and the Heil factory engineering division will welcome an opportunity to present complete specifications and recommendations. Heil Oil Burners bear the Underwriter's label of approval and are approved by various State and municipal authorities. All burner ratings are EDR and based on 60% boiler efficiency. All combination unit ratings are based on 80% efficiency.

HEIL CONVERSION OIL BURNER MODELS X, 1, 2, 3, 4

Specifications and Ratings of Model "X" Heil Oil Burner

⅛ h. p. resilient mounted motor; fuel unit consisting of oil pump, strainer, automatic shut-off valve; Sirocco type fan statically and dynamically balanced; 110/10,000-volt transformer; electric ignition; automatic controls. Ratings: 700 sq. ft. steam; 1100 sq. ft. hot water; 1250 sq. in. hot air or 175,000 B.t.u. per hour. Burns No. 3 oil.

Specifications and Ratings of Model 1SS Heil Oil Burner

Motor fan and pump mounted in line; cradle mounted ⅛ h. p. motor; large capacity Heil oil filter; electric ignition; efficient Heil shut-off valve; 110/10,000-volt transformer; internal gear type oil pump; automatic controls. Ratings: 1000 sq. ft. steam; 1600 sq. ft. hot water; 1650 sq. in. hot air. Burns No. 3 oil.

Specifications and Ratings of Model 2A Heil Oil Burner

⅙ h. p. cradle mounted motor; internal gear type pump; belt driven and tested for 26 in. of vacuum; 110/10,000-volt transformer; electric ignition; large capacity Heil oil filter; efficient Heil shut-off valve; automatic controls. Ratings: 2100 sq. ft. steam; 3350 sq. ft. hot water; 3400 sq. in. hot air or 500,000 B.t.u.'s per hour. Burns No. 3 oil.

Specifications and Ratings Model 3 Heil Oil Burner

⅓ h. p. single-phase motor; 110/10,000-volt transformer; belt driven pump; electric ignition; large capacity Heil oil filter; efficient Heil shut-off valve, automatic controls. Ratings: 3500 sq. ft. steam; 5600 sq. ft. hot water; 5800 sq. in. hot air or 840,000 B.t.u.'s per hour. Burns No. 3 oil.

Specifications and Ratings Model 4 Heil Oil Burner

½ h. p. single-phase motor; 100/12,000-volt transformer; double electric ignition; belt driven pump; large capacity Heil oil filter; efficient Heil shut-off valve; automatic controls. Ratings: 5000 sq. ft. steam; 8000 sq. ft. hot water; 8300 sq. in. hot water; 8300 sq. in. hot air or 1,200,000 B.t.u.'s per hour. Burns No. 3 oil.

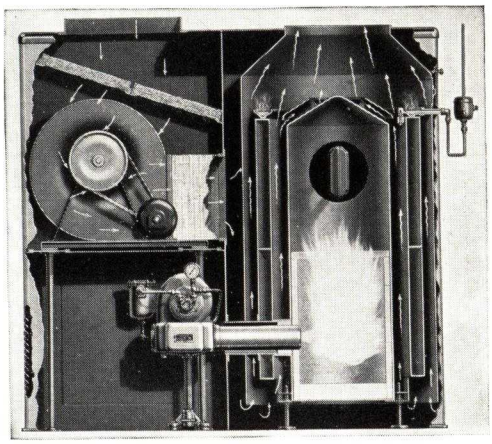
Heil Industrial Oil Burner Equipment

A complete series of power units and nozzle assemblies for bake ovens, lead pots, large heating boilers and all industrial applications. Ask a Heil representative for literature and recommendations.

HEIL DE LUXE MODEL "O" AND "OO" AIR-CONDITIONING UNITS

The Heil De Luxe Air Conditioning Unit consists of: A Model "O" or "OO" Heil Furnace, Model 1 Heil Oil Burner, blower and filters. This compact assembly is enclosed in an attractively finished cabinet-type casing. The Heil conditioner is suitable for installation in old and new homes and insures maximum heating efficiency and minimum fuel cost.

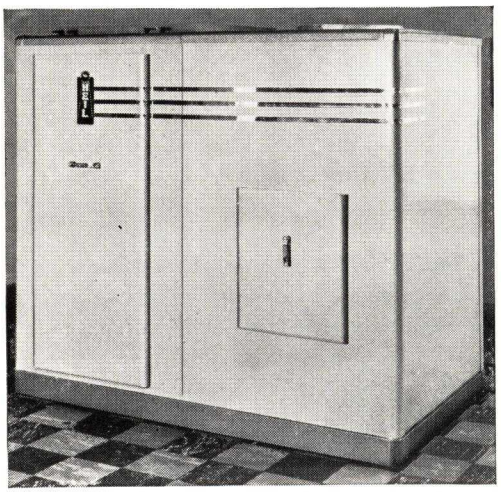
The cross-section of the Heil De Luxe Air Conditioning Unit (illustrated below) shows the filters and cushion-mounted blower upper left. Heil Oil Burner is shown in the space immediately below the blower. The Heil All-welded Steel Furnace (shown at the right) is surrounded by an inner casing which distributes and directs the forced air to the bottom where the air enters the heating area, rises as it becomes heated and passes up through the circular outlet at the top. A circular, cast-iron humidifier pan is mounted on top of radiator. Where price is a factor, the Heil furnace burner unit can be furnished with either a round or square jacket, less blower, filters and deluxe casing.



Cross Section of Heil Model "O" and "OO" Air Conditioning Unit

SPECIFICATIONS

	Model "O"	Model "OO"
Capacity (b.t.u. per hour)....	120,000	150,000
Replacement type filter area, sq. in..	1500	2400
Float control humidifier evaporating capacity lb. per hr.....	10	12
Burner	No. 1 SS	No. 1 SS
Maximum blower output, c.f.m., at $\frac{1}{10}$ w.s.p.....	2600	2600
Blower r.p.m...	500	500
Blower motor, hp.	¼	⅓



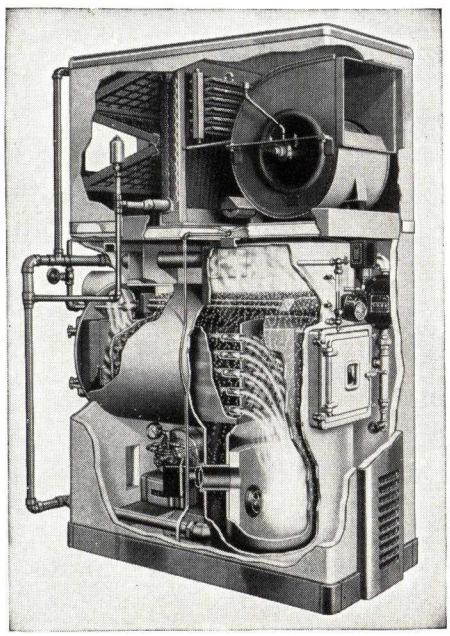
Heil Model "O" and "OO" Oil Fired Air Conditioning Unit

HEIL INDIRECT AIR-CONDITIONING UNIT

A complete system consisting of a Heil Boiler-Burner Unit and a Heil Indirect Air Conditioning Unit which mounts on top of the boiler-burner unit as shown; or if basement ceiling height does not permit, adjacent to the boiler-burner unit.

THE HEIL CO. manufactures the complete unit. The boiler is single pass, horizontal fire-tube design and all-welded steel construction. The burner is an efficient Heil Model 1 Oil Burner. The unit is enclosed in an enameled finished casing which completely encloses all operating parts. Where conditioner can be mounted on top of the boiler-burner unit, only 28x54½ in. floor space is required. This Heil Unit can be installed to provide circulating, humidified air to every room in the home or, if desired, such rooms as bathroom, kitchen, garage, etc., can be heated by radiators and the other rooms by circulating, conditioned air.

The Heil Boiler-Burner Unit illustrated below, also can be furnished separately for steam, hot water or vapor heating service.



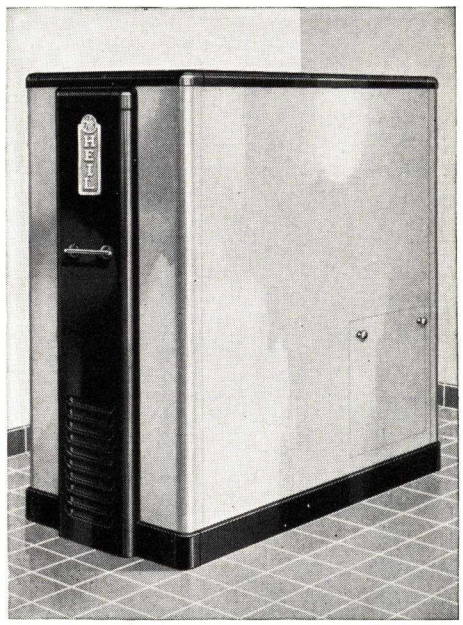
Cut-away View of Heil Indirect Air Conditioning Unit Showing Conditioner Installed on Top of Boiler-Burner Unit

SPECIFICATIONS INDIRECT UNIT (Left)

	Model 50-140	Model 65-140
Max. boiler output, B.t.u. per hr....	200,000	275,000
Max. output of conditioner, B.t.u. per hr.....	140,000	140,000
Humidifier evaporating capacity, lb. per hr.....	10	10
Additional hourly load boiler can handle in domestic hot water load, steam radiation plus piping and pickup, B.t.u....	45,000	110,000
Outlet temperature of air leaving conditioner.....	150° F.	150° F.
Max. blower output, c. f. m. at ⅜ sp.....	1600	1600
Blower, r.p.m.....	525	525
Motor hp., 110-v., 60-cy., 1750 r.p.m split-phase	¼	¼
Filter area, sq. in...	1080	1080

SPECIFICATIONS HEIL BOILER-BURNER UNIT (Right)

	H-TEE 50	H-TEE 65
Max. boiler output in B.t.u. per hr...	200,000	275,000
Gross steam radiation (sq. ft.) E.d.r.....	800	1050
Pounds of evaporation from 150° F. water to 2 lbs. steam.....	200	260
Gross hot water radiation (sq. ft.) E.d.r.....	1330	1830
Gallons of oil burned per hour..	1.85	2.50
Minimum recommended chimney, in.....	8x12	13x13
Minimum chimney height, ft.....	35	35



The Heil Boiler-Burner Unit Is Encased in an Attractive, Cabinet Type, Insulated, Enameled Steel Jacket

HOLLAND FURNACE COMPANY

Manufacturers and Installers of Holland Forced Air Conditioning Systems, and Holland Vaporaire Heating Systems, Including Automatic Coal Burning and Oil Burning Equipment

HOLLAND, MICHIGAN

The Company

The HOLLAND FURNACE COMPANY, established in 1906, pioneered in warm air heating for the home—just as it has pioneered in home air conditioning. It is today the world's largest installer of home heating and air conditioning systems.

Its 32 years' of steady, substantial growth is undoubtedly due to a rigid policy that every installation must be right in every respect.

Sales Offices

There are over 425 direct factory branches of the HOLLAND FURNACE COMPANY in the United States. Manufacture, sales, installations, and service are directly supervised with HOLLAND assuming all responsibility.

LOCAL BRANCH OFFICE

Trained Heating Men

Every Holland branch has one or more thoroughly qualified heating men with whom the architect may consult. His practical experience in the field, combined with the thorough training given, makes him thoroughly qualified in quoting Holland products.

Architectural Service

Direct factory supervision relieves the architect of the burden of responsibility. With Holland assuming the responsibility, and co-operating with the architect at the time of construction, he is assured of a properly installed heating system.

WHAT THE HOLLAND SYSTEM DOES FOR THE HOME OWNER

Leading health authorities the world over acknowledge that of all the different types of heating devices there is none more suitable for the home than a scientifically designed heating system, circulating cleaned, humified and warmed air. Many State laws specifically demand that schools, churches and auditoriums be heated by this type of system. Such a system circulates and changes the air in all rooms several times each hour. It moistens the air and provides uniform, moderate warmth in every nook and corner of every room. When such a system is employed there is little variation in the degree of warmth at floor line, breathing line or ceiling. Heat alone is not comfort. When the air you breathe is artificially warmed, it must also be scientifically circulated, cleaned and humified.

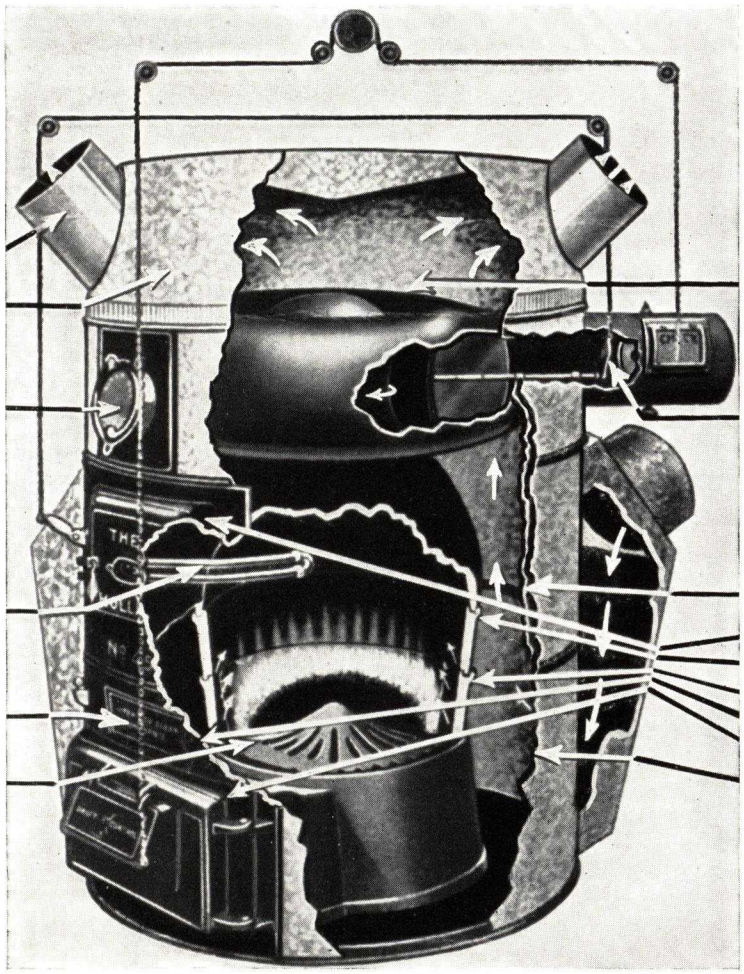
Holland provides a refreshing, stimulating indoor atmosphere by properly warming and humidifying the air and keeping it in constant circulation. The combination of these essential elements produces an ideally healthful condition in the home.

HOLLAND VAPORAIRE HEATING SYSTEM

The Holland Vaporaire Heating System is especially adapted for the home, church, school and such other buildings where healthful heat is desired.

Specifications

(a) It burns all types of fuel—gas, oil, coke, coal—efficiently; (b) one may burn either bituminous or anthracite, including the small pea and buckwheat sizes, without changing grates; (c) low maintenance and servicing cost; (d) economical in the use of fuel; (e) efficient heat transfer from the fuel to the circulated air; (f) provides healthful heat because it furnishes proper humidity circulation, and moderately warmed air; (g) prevents cold floor drafts; (h) simple to operate; (i) it is flexible and can be operated in accordance with outdoor weather conditions; (j) it provides even temperature throughout the home; (k) it may be converted into a fan forced air system or air-conditioning system; (l) guaranteed heating service.



Step-saving regulator or thermostat is operated from upstairs.

Vaporaire risers are covered with heavy fireproof asbestos.

Heat distributor distributes conditioned air to all risers with less friction.

Clean-out door and safety valve.

Hot water for all household uses.

Holland's humidifier automatically keeps the air properly moistened.

The cone-shaped grate in combination with mixing celled primary combustion chamber keeps the fire against the outside walls.

Vaporaire risers are out of the way.

Holland's heat radiator is a one-piece casting with no bolts to expand or joints to leak.

Direct-indirect damper forces heat to make a complete circuit of the radiator.

Return air accelerators conserve basement room and increase circulation 30%.

Heat insulator keeps heat from escaping into basement.

Leakproof cup-joints. Tightly fitted and cemented joints prevent leaks.

Dustproof casing keeps out basement dirt.

CONSTRUCTION

Holland Furnaces—(a) Made of Hollandized iron, the highest grade of cast iron; (b) minimum number of sections; (c) constructed of non-corrosive materials; (d) are of durable construction for long serviceable life; (e) no leakage of combustible gases or smoke into the air-heating chamber; (f) cup joints are deep, and wide, to allow for proper expansion; (g) joints sealed with asbestos furnace cement made to our own specifications.

Furnace Base Plate—Cast in one piece with deep flange to allow proper sealing to ash pit. It is slightly concave in order to hold water for moistening of the ashes. Cup pressure joints prevent ash-dust entering the air heating chamber and distributing system.

Ash Pit—It is of sturdy construction. Deep, cast in one section, machined to fit over base.

Grate—(a) Is of circular design; (b) cast in one piece; (c) cone shaped to keep the fuel at the walls of fire pots; (d) operates on roller bearings; (e) narrow air slots prevent the smaller sizes of fuel dropping into the ash pit.

Fire Pot—Made in two sections to allow for expansion and contraction of the metal. The lower half is cast with funnel shaped air jets for injecting pre-heated air to unite with the combustibles. This feature alone is worth the slight additional cost.

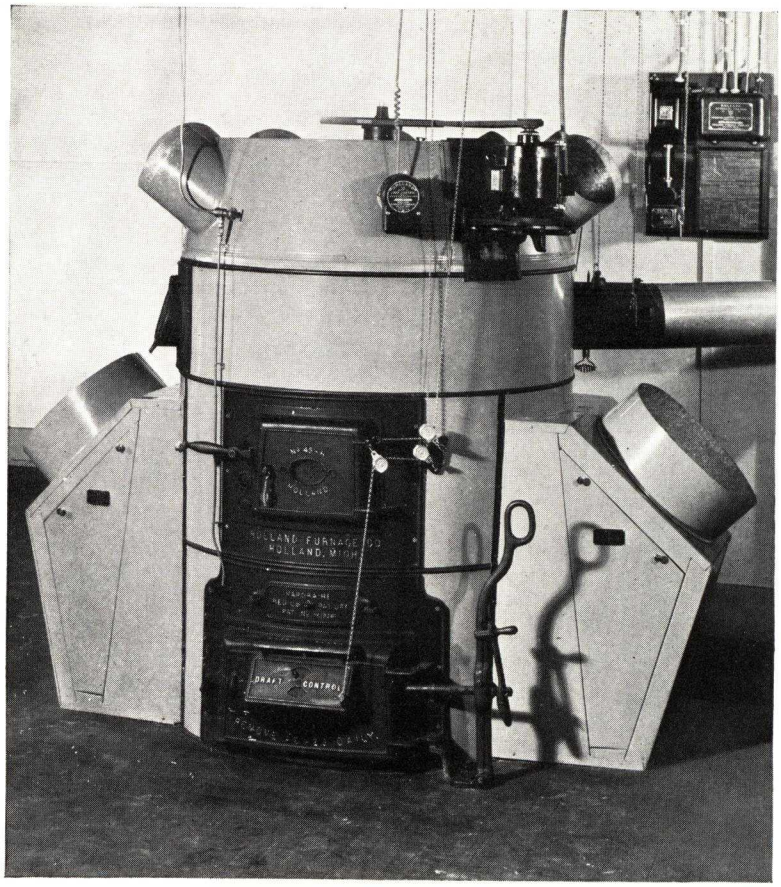
Combustion Chamber — (a) Is a one-piece, core-made casting; (b) it is of rigid construction, designed to provide the maximum of space to complete combustion. This insures against smoke and gas leakage into the air-heating chamber; further, it provides extra heat radiation.

Radiator—(a) Is a core-made casting constructed in one section throughout; (b) it is gas and smoke proof. (c) Because of its direct-indirect damper, it provides a complete fire travel the full length of the radiator before the hot gases enter the chimney flue, thus the maximum of heat transmitting surfaces are available.

Humidifier—(a) The Holland Humidifier is an integral part of every Holland Vaporaire Heating Unit. (b) It is hand-operated with a drip sight valve. (c) Assures constant flow of water to humidifier at all times. (d) Evaporates sufficient water to provide proper relative humidity. (e) An overflow outlet allows the surplus water to moisten the ashes which eliminates dust when cleaning the furnace.

HOLLAND TYPE "A" AIR CONDITIONER

Filtered Air—Automatically Controlled



A product of the HOLLAND FURNACE COMPANY, Holland's Type "A" Air Conditioner is an electrically powered circulator that forces air to every room, creating greater winter comfort and also a summer cooling effect. The air is filtered which results in greater cleanliness in the home.

(a) This equipment can be attached to any good warm air furnace with satisfactory results; (b) draws the cold air off the floor of the rooms and brings the warmer air down from the ceiling, thus the floors are always warm; (c) operates very quietly; (d) provides from four to six air changes per hour in each room heated; (e) increases over-all efficiency of the heating system; (f) reduces the heat transmission through leader pipes and furnace casing; (g) prevents overheated furnaces; (h) lowers fuel consumption.

HOLLAND FURNACE, WEIGHTS AND CAPACITIES

Furnace No.	Diam., fire-pot, in.	Diam., outer casing, in.	Over-all height, casing and hood, in.	Area of grate, sq. in.	Diam. of smoke pipe, in.	Wght. of cast-ings and cas-ings, lbs.	Net B.t.u deliv-ery at regis-ters hourly forced air	Pip-ing cap-acity, sq. in.	Resi-dence heat-ing capac-ity, cu. ft. (aver.)
37-H	19	37	64	227	8	980	50,000	350	6,000
40-H	21	40	65	276	8	1085	65,000	475	9,000
45-H	24	45	66½	355	8	1245	85,000	600	14,000
50-H	27	50	67½	462	9	1500	120,000	750	22,000
60-H	31	60	69½	605	9	2000	175,000	1000	32,000
24-Steel	24	45	66½	314	9	925	85,000	570	14,000
27-Steel	27	50	67½	415	9	1070	105,000	700	22,000

HOLLAND TYPE "B" AIR CONDITIONER

The entire heating system with the "B" air conditioner may be placed in the basement or heater room. Due to the compact design it is possible to utilize the remaining part of the basement for recreational purposes.

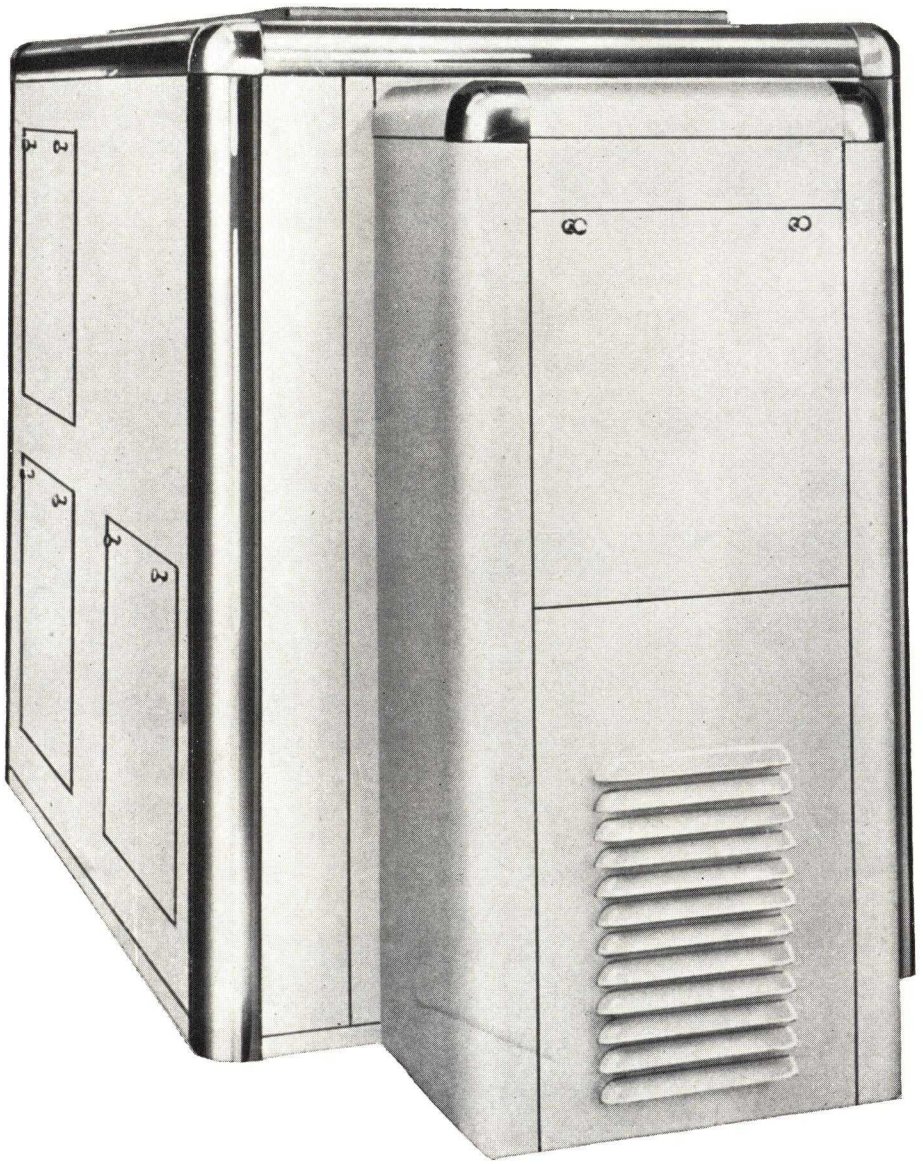
The air conditioner draws the cold air from all the principal rooms of the residence, filters it, and delivers the warmed and humidified air to the rooms by means of concealed ducts.

The blower unit itself is located at the rear of the furnace with the silent balanced fan wheel, motor, and filters. The motor is suspended in resilient mountings, providing for quiet operation. The blower and motor frames are supported on cork mountings. Handy service doors provide for ready entrance for oiling moving parts and the removal of filters.

With Holland's controls, the entire system is automatic. During the heating season, the control operates the draft as well as the air conditioner motor. The home may be left for several days at a time and entirely in charge of the automatic controls which will keep the room temperature at a predetermined thermostatic setting regardless whether the furnace is oil, gas, or stoker fired.

During the summer months, the blower unit may be operated at a higher rate of speed. Circulating the air at this higher rate provides cooling effect, creating greater comfort.

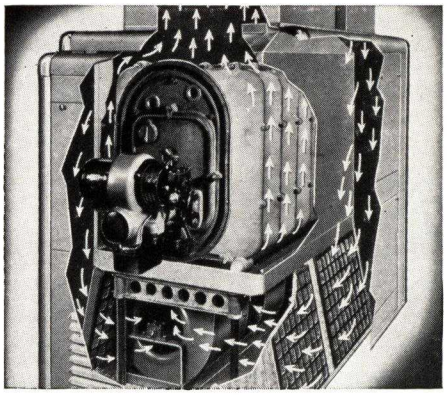
HOLLAND OIL FURNACE AIR CONDITIONER



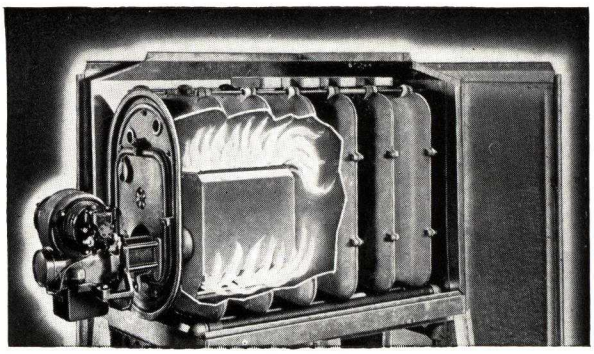
In this burner unit, Holland technicians have incorporated many improvements for silence, safety and economy.

The new type of combustion chamber heats instantly, giving immediate maximum combustion efficiency, thus acting as a perfect refractory, burning the oil while it is in suspension. It is constructed of a special and new type of high temperature metal, thus eliminating the refractory cement or brick lining which inherently retards the burner from reaching maximum efficiency.

HOLLAND OIL FURNACE AIR CONDITIONER



The unit is surrounded with two casings. Cool air returning from the rooms is drawn down through an increased filter area so that there can be no outward leakage. At the same time, the air is preheated by contact with the inner casing, thus utilizing heat ordinarily lost by radiation into the basement or by absorption into insulating materials.



Although extremely compact, this unit actually has more heating surface, due to the hollow ribs. Every square inch, moreover, is active heating surface, radiating warmth only into the air that goes into the rooms.

The danger of excessively dry air cannot be present with this system. A special adaptation of the famous Holland Cascade Humidifier assures ample moisture in the air at all times. As the air grows warmer, more moisture is automatically supplied.

Yet these are no delicate controlling mechanisms to get out of order, and it cannot be put out of order by mineral deposits from hard water.

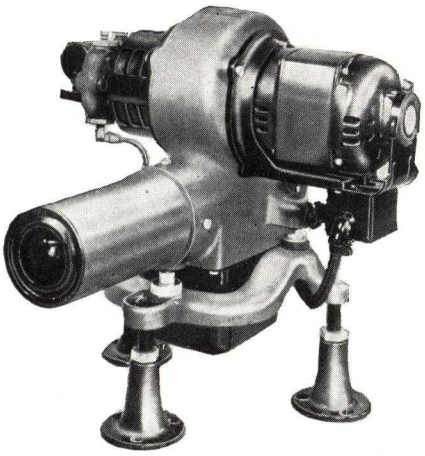
UNIT SPECIFICATIONS

Unit No.	545	650	760
Capacity—B.t.u. at grilles	115,000	145,000	180,000
Approximate heating capacity—cubic feet	21,000	28,000	34,000
Motor horsepower	⅓	⅓	½
Motor voltage	110	110	110-220
*C.f.m. delivery at ½-in. s.p.	1900	2256	3158
Smoke pipe size, inches	8	8	8
Minimum recommended flue size, inches	8½ x 8½	8½ x 13	8½ x 13
Over-all length, inches	73	80½	88
Over-all width, inches	45	45	45
Minimum basement depth, inches	80	80	80
Minimum distance between back of unit and chimney, inches	24	24	24

* Variable speed motor pulley may be adjusted to meet installation requirements.

HOLLAND CONVERSION GUN OIL BURNER—TYPE CG-1

The Holland Conversion Gun Oil Burner, Type CG-1 may be installed in most any domestic warm air, hot water or steam heat generating system.



MECHANICAL DESCRIPTION

Pump—Dual purpose internal gear type, self-lubricating, 20-gallon capacity vacuum pull 25 inches while developing 100 pounds pressure, lift 6 to 10 feet.

Motor—Model CG-1, ⅙ horsepower equipped with special rubber base mounting—1145 revolutions per minute with direct drive to burner fan and oil pump.

Pressure Cut-off Valve—Oil pump is equipped with pressure regulating cut-off valve. If oil pressure drops to 80 pounds or less, the burner automatically stops, thus eliminating overflow of oil into combustion chamber.

Ignition Transformer—Non-radio interference type; 10,000-volt intermittent electric arc ignition.

Electric Current Requirements—110 volts, 60-cycle standard on Model CG-1.

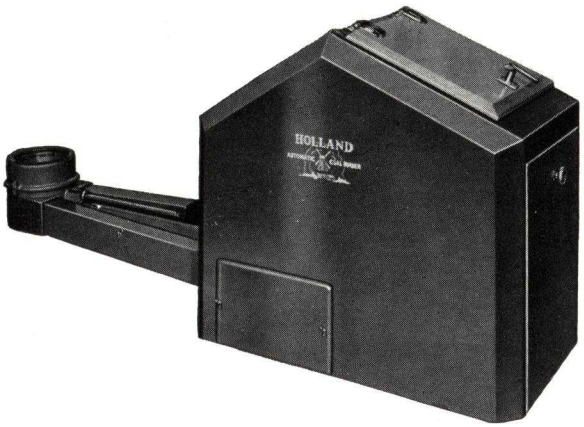
Oil Specification—Tested for A.O.B.A. No. 3 light. Burns No. 2 or No. 1 in absence of No. 3 light.

Combustion Chamber—Special Holland design, built in ashpit.

Automatic Control—Protects ignition, flame or power failure; room thermostat regulates house temperature; furnace hood control prevents overheating of heat generator.

Approval—Holland CG-1 Oil Burner carries the Underwriters' label. It is also approved by the New York Board of Standards and Appeals and furthermore by the various States requiring their special approval.

HOLLAND AUTOMATIC COAL BURNER



The Holland Automatic Coal Burner may be installed in most domestic heat generating systems employing warm air, hot water, or steam as the heat transfer medium.

MECHANICAL DESCRIPTION

Sizes—The Holland Automatic Coal Burner is available in three sizes with capacities of 20, 30, and 40 pounds per hour. Each burner hopper has a 400-pound fuel capacity.

Air Volume Control—Automatically regulates the amount of air supplied in accordance with the condition of the fire and the rate of feeding fuel. This accurate and scientific control of air improves the operation and is responsible for greater efficiency, complete combustion, and a material saving in fuel.

Shear Plate—Designed to prevent foreign material in the coal from damaging equipment. Easily accessible to remove obstruction without removing the coal or backing out the feed screw.

Smoke Eliminator—Special by-pass cast in the retort admits air under pressure to the feed screw and prevents hopper smoke.

Current Requirements—110 volts, 60-cycle standard on all models. Special adaptations available on request.

Coal Specifications—Bituminous or semi-bituminous, top size 1 inch, low ash content, 2000 to 2500 degrees fusion temperature, properly oil treated to allay dust.

Combustion Chamber—Special Holland design built in the ashpit of high temperature refractory material.

Controls—Completely automatic to insure absolutely safe, dependable operation. Includes a room thermostat, protective limit control, and time relay which maintains fire during mild weather.

INGERSOLL-RAND COMPANY

11 Broadway, NEW YORK, N. Y.

ATLANTA	CHICAGO	DULUTH	LOS ANGELES	PICHER	SAN FRANCISCO
BIRMINGHAM	CLEVELAND	EL PASO	NEWARK	PITTSBURGH	SCRANTON
BOSTON	DALLAS	HARTFORD	NEW ORLEANS	POTTSVILLE	SEATTLE
BUFFALO	DENVER	HOUSTON	NEW YORK	ST. PAUL	ST. LOUIS
BUTTE	DETROIT	KNOXVILLE	PHILADELPHIA	SALT LAKE CITY	TULSA

WASHINGTON, D. C.

Branches or Distributors in Principal Cities the World Over—To Avoid Delays in Correspondence Address Requests to Nearest Branch

WATER-VAPOR REFRIGERATION

I-R Water-Vapor Refrigeration uses water as the only refrigerating medium. There is no refrigerant to purchase or replace. The system operates entirely under vacuum, and may be opened up for inspection whenever desired.

Water-Vapor Refrigeration gives lower operating costs by saving refrigerant replacement and by economical operation at light as well as full loads. Of special value is its unusual ability to handle overloads with a smaller increase in chilled-water temperature than with other types of units. Full capacity is retained for the life of the machine.

Two types of units—Steam-Jet Cooler and Centrifugal—permit the selection of the most economical equipment to meet widely varying conditions of steam or electric power, cooling water supply and refrigerating requirements.

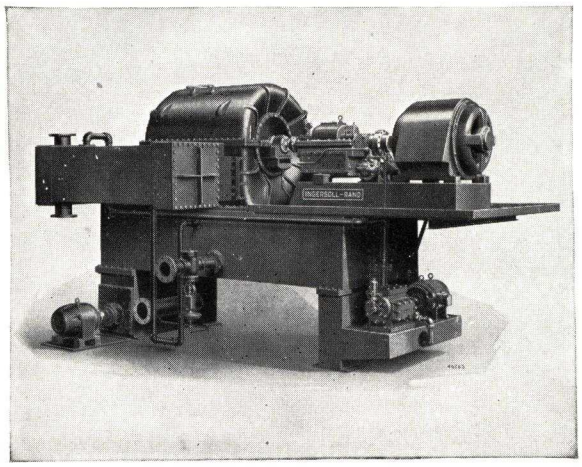
I-R Units are ordinarily sold through reliable contractors for field installation as a part of air conditioning systems.

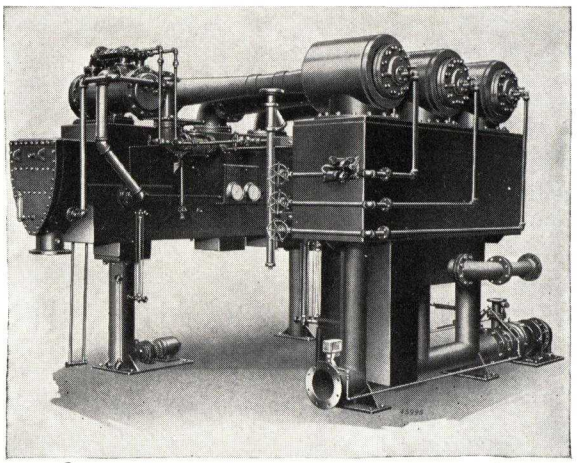
Steam-Jet Cooler Type

Cooling is effected by direct evaporation of water at high vacuum. Steam-jet boosters maintain the vacuum, and discharge the evaporated water vapor into a surface condenser. (When desired, barometric type condenser units can be furnished.) The heat carried away by the evaporation of the water vapor chills the main body of water as it is circulated through the unit.

The I-R patented design has been specially developed to insure reliability and simplicity of operation. Steam-Jet Coolers are free from noise and vibration, and are the easiest of all refrigerating equipment to install and maintain.

Standard sizes are available for capacities of approximately 10 tons upward for chilled water temperatures of 35° F. and higher. Units are built for steam pressures of 2-lb. gauge and upward.





Centrifugal Water-Vapor Refrigeration

The centrifugal water-vapor refrigerating unit likewise cools water by direct evaporation of water at high vacuum. A centrifugal type compressor maintains the vacuum by compressing the water vapor and discharging it into the condenser.

Units can be furnished with electric-motor or highly efficient steam-turbine drivers. Turbines may be either of the low-pressure or high-pressure type, and may be designed for back pressure or for condensing operation.

An important feature is self-regulation; units simply float on the load, giving inherently reduced power consumption with decreasing demand. The capacity is sustained for life due to the elimination of wearing parts.

Standard sizes are available for capacities of approximately 100 tons upward.

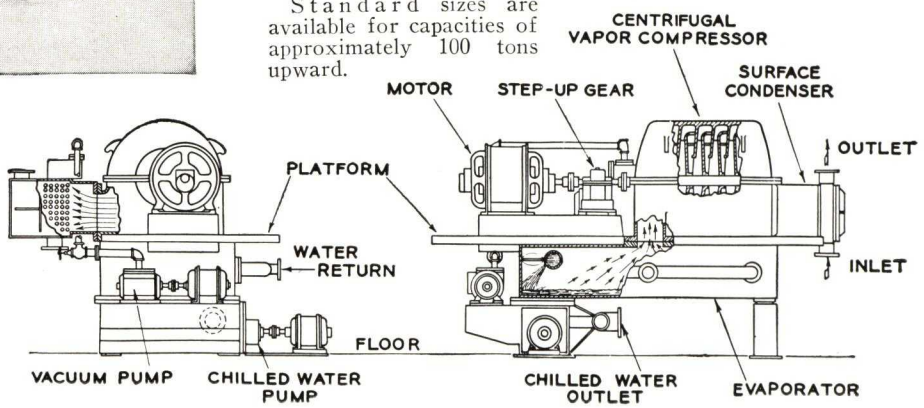


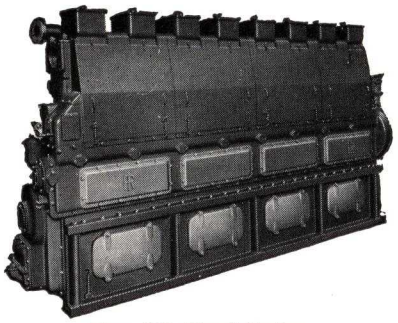
Diagram Shows Simplicity of the I-R Centrifugal Unit Shown Above

DIESEL ENGINES

I-R Type "S" Diesel engines assure economical power production by combining low fuel consumption with efficient power transmission and low maintenance expense. Their modern, compact design makes possible low installation costs.

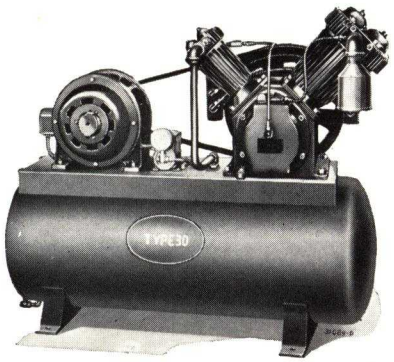
More than 150 I-R Diesel engines of this general type are in operation today. Many units are providing economical power in office buildings, industrial plants, etc.

They are built with 3, 4, 5, 6 and 8 cylinders with ratings from 150 to 460 hp.

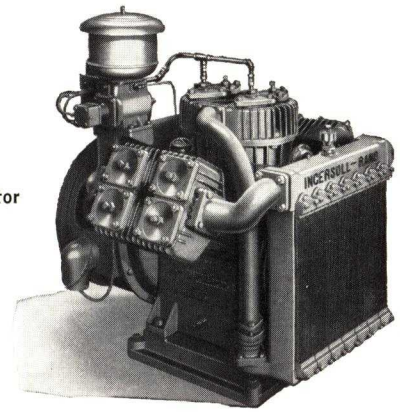


Type "S" Diesel Engine

AIR COMPRESSORS



Two-stage Receiver—Mounted—Type 30 Compressor



Two-stage Air-cooled Motor Compressor

Ingersoll-Rand builds more than a thousand sizes and types of air and gas compressors from ¼ to 3000 hp. for all kinds of service.

Type 30 two-stage air-cooled self-contained compressors are ideal for many applications where small amounts of air are needed. Sizes range from ¼ to 15 hp. with piston displacements from 1.2 to 102 cu. ft. per min. for pressures from vacuum to 1000 lbs. per sq. in.

Three types of automatic control can be furnished for the most economical operation. Mountings are available for nearly every type of service.

The Type 40 Motorcompressor consists of a two-stage air-cooled radial type compressor with built-in electric motor. These compact machines are highly efficient and require minimum attendance. Complete air cooling of cylinder and intercooler eliminates the need for water—no water piping, no water cost, no freezing.

They are built in sizes from 15 to 75 hp. with displacements from 79 to 445 cu. ft. per min. for pressures from 80 to 125 lbs. per sq. in. Also furnished for V-belt or flexible-coupled motor drive.

CAMERON PUMPS

There is an efficient, reliable Cameron pump for every purpose. Single-stage centrifugal units range from 40 to 100,000 gal. per min., and multi-stage units (2 to 8 stages) range from 125 to 3000 gal. per min. for pressure up to 3000 lbs.

The Cameron "Motorpump" is ideal for general service everywhere, ranging in sizes from ¼ to 40 hp. Pumps and motors are built as one compact and efficient unit on a single shaft. They can be mounted in any position on the floor, wall or ceiling.

Capacities range from 5 to 1000 gal. per min. for heads as high as 220 ft. single-stage; and from 20 to 275 gals. per min. for heads up to 500 ft. two-stage. Motorpump Condensate Return Units are also available in a complete range of sizes.

The Cameron Motorpump

Motors for any common current conditions; open, splash-proof, totally-enclosed, or explosive-proof types.

THE LENNOX FURNACE CO., INC.

Aire-Flo Air-Conditioning Units—Riveted Steel Furnaces

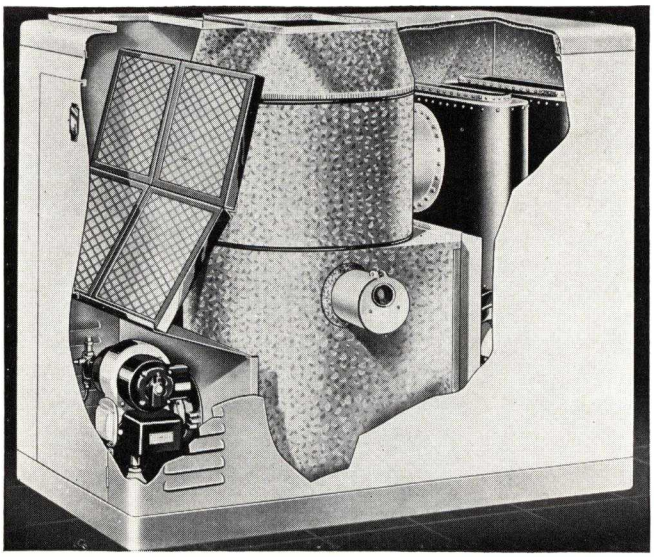
MARSHALLTOWN, IOWA SYRACUSE, NEW YORK

DEALERS IN PRINCIPAL CITIES

LENNOX WINTER AIR CONDITIONING UNITS

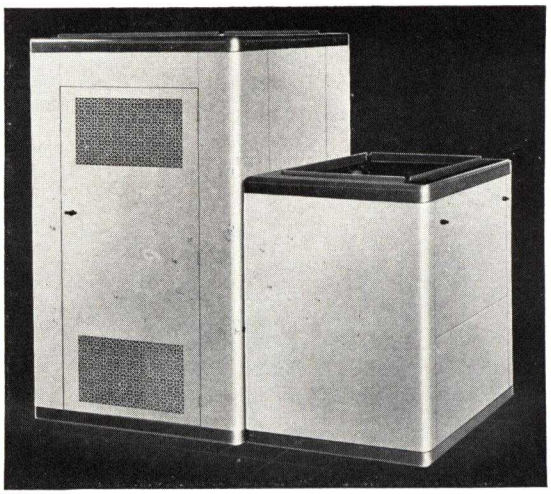
The Lennox line of warm-air heating and air-conditioning equipment is complete, containing units specially designed for every type of fuel, and sizes ranging from 50,000 to 1,000,000 B.t.u. per hour at the register. All heaters are of the famous riveted, calked steel construction—permanently gas- and dust-tight. Every unit throughout the line is designed to deliver air at uniform temperature and velocity to all warm-air ducts. As a result, these units are unusually easy to balance.

Lennox units have long been famous for their high efficiency, quick response to temperature changes and long life. The company has been manufacturing steel warm-air heating equipment for more than 40 years and has pioneered the field of residential forced-air heating. Complete specifications and descriptions of the complete line on request.



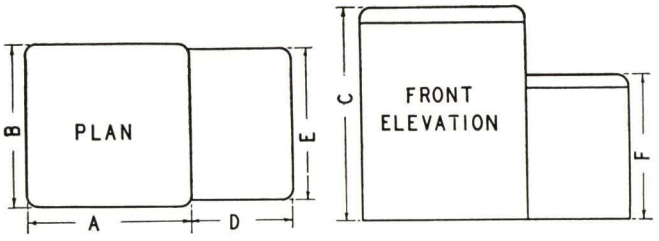
Lennox F3 Series Oil Aire-Flo

Exclusive counter-current principle uses full volume of cold air to insulate cabinet and to extract heat from flue radiators. Heat loss through cabinet less than one-half of 1 per cent. Low stack losses. Inserted steam type humidifier. Large glass filters. Low-speed DW.D.I. blowers. Insulating type, pre-cast refractory results in cleaner fire, faster heating and higher efficiency. Heater, filters, blower, humidifier and oil burner in one attractive cabinet. Illustration above shows galvanized inner casing which surrounds riveted steel heater.



Lennox CQ Series Oilfyre Aire-Flo

A smaller low-cost oil-fired air conditioner for the smaller home. Leakproof riveted-steel heater. Large, silent blower. Inserted humidifier. Precast insulating-type refractory. Blower cabinet can be placed on either side. Burner enclosed.

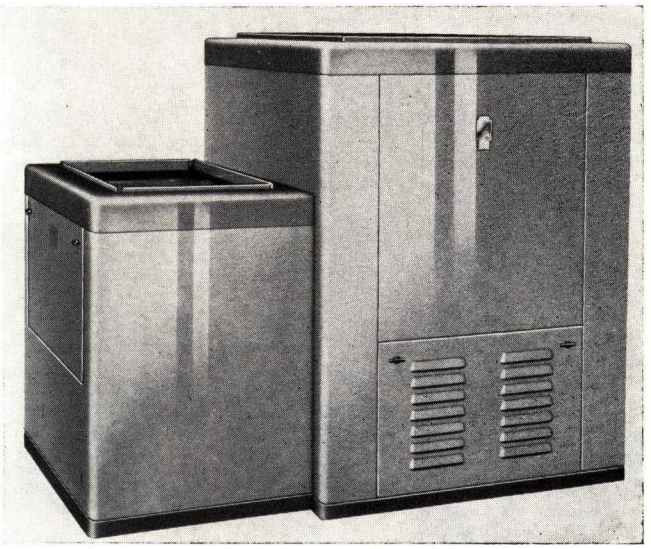


Unit No.	B.t.u. at registers	Heating surface, sq. in.	Normal c.f.m.	Number, and size of filters, in.	Dimensions, in.					
					A	B	C	D	E	F
F3-125-1	80,000	11,358	1050	4–16x20	40	73 7/16	59	.....	.....	.....
F3-125-2	100,000	11,358	1310	4–16x20	40	73 7/16	59	.....	.....	.....
F3-125-3	125,000	11,358	1640	4–16x20	40	73 7/16	59	.....	.....	.....
F3-200-1	150,000	14,597	1960	6–16x20	48	83	59	.....	.....	.....
F3-200-2	175,000	14,597	2300	6–16x20	48	83	59	.....	.....	.....
F3-200-3	200,000	14,597	2620	6–16x20	48	83	59	.....	.....	.....
F3-300-1	250,000	17,683	3300	9–16x20	60	104	63	.....	.....	.....
F3-300-2	300,000	17,683	3920	9–16x20	60	104	63	.....	.....	.....
CQ-1701	75,000	7,474	920	2–16x25	39	47	61	26	33	30
CQ-1721	100,000	7,474	1240	4–20x20	39	47	61	30	40	36

Lennox Gas Aire-Flo

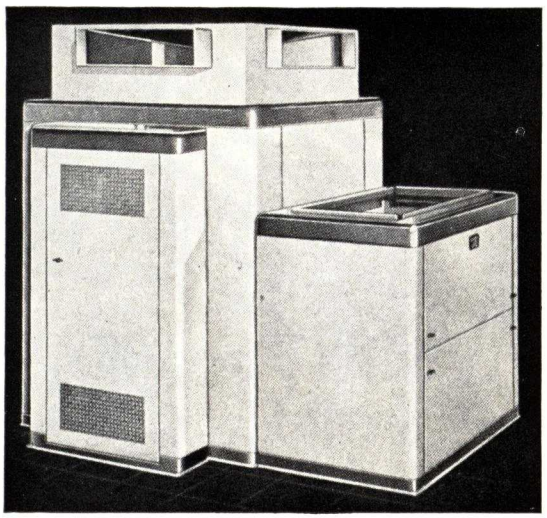
For Natural, Manufactured or Mixed Gas

Designed exclusively for gas, with the greater amount of heating surface required for this fuel. Highly efficient. A.G.A. approved. K2-5 Series has a large doughnut radiator completely encircling the combustion chamber. Larger units have two concentric doughnut radiators. All controls, except main shut-off, enclosed. Each unit equipped with new Lennox gas burner, external pilot lighter, automatic shut-off and full automatic controls. Blower cabinet can be placed on either side.



Unit No.	B.t.u. at register	Heating surface, sq. in.	C.f.m. range	Number, and size filters, in.	Dimensions, in.					
					A	B	C	D	E	F
K2-501	70,000	7,760	500–1000	2–16x25	38	45½	58	26	33	30
K2-521	80,000	7,760	800–1400	4–20x20	38	45½	58	30	40	36
K2-1521	100,000	12,814	800–1400	4–20x20	45	48½	58	30	40	36
K2-1522	125,000	12,814	1300–2000	4–20x20	45	48½	58	30	40	36
K2-2062	160,000	18,623	2000–2600	6–16x25	53½	57	63	34	48	43
K2-2063	200,000	18,623	2400–3000	6–16x25	53½	57	63	34	48	43

Lennox C8 Aire-Flo for All Fuels



These units are designed especially for coal, but because of their large heating surface and long gas travel, they are also efficient with other fuels. Riveted-steel heater. Overhead automatic humidifier. Air-cooled cabinet. Direct-indirect draft. Large silent blower. Larger filter area.

The QB Series—Not illustrated, also for all fuels, is a lower-priced unit for the smaller home. This unit contains the features usually found in good riveted steel air conditioners. Only slightly lower in efficiency than the C8 Series. Ideal for the small home.

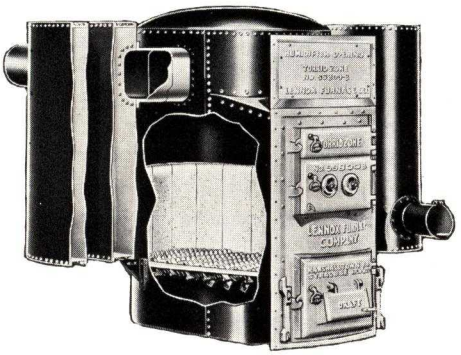
Unit No.	B.t.u. at registers			Grate area, sq.in.	Heating surface, sq.in.	Normal c.f.m. range	Number, andsize of filters	Dimensions, in.					
	Soft coal	Hard coal	Gas-oil stoker					A	B	C	D	E	F
C8-2422	110,000	100,000	120,000	318	7,674	1300–2000	4–20x20	40	45⅜	59	30	40	36
C8-2722	120,000	110,000	135,000	415	8,977	1300–2000	4–20x20	44	49⅝	61	30	40	36
C8-2761	125,000	115,000	145,000	415	8,977	1600–2300	6–16x25	44	49⅝	61	34	48	43
C8-3262	150,000	140,000	170,000	605	10,712	2000–2600	6–16x25	51	59¾	63	34	48	43
C8-3263	175,000	160,000	200,000	605	10,712	2400–3000	6–16x25	51	59¾	63	34	48	43
C8-3582	200,000	180,000	225,000	719	15,333	3300–4000	9–16x20	61⅜	61⅜	71	36	60	56
C8-35211	275,000	245,000	325,000	719	15,333	4000–5000	12–16x20	61⅜	61⅜	71	36	65	59
SS-800	800,000	720,000	1,000,000	1037	28,728	Special	.....	62*	96*	74½	.....	.....	.....
QB1-220	70,000	60,000	75,000	262	5,438	500–1000	2–16x25	37	38⅜	56	26	32	30
QB1-242	95,000	85,000	105,000	318	6,684	800–1400	4–20x20	41	42¾	56	30	40	36
QB1-272	115,000	105,000	130,000	415	7,416	1300–2000	4–20x20	44	46¼	58	30	40	36

*Casing Obround.

Lennox Cooling Equipment

Powered by the famous Lennox silent blower. Finished to match the Lennox winter air conditioners. Cold-water units contain extended fin type coil. Mechanical units designed to take standard evaporator. Complete with blower, filters and eliminator plates. Complete information on request.

Lennox SS-800 Mammoth Forced Air Furnace



1,000,000 Btu. per hour at the register in one unit. Especially economical for stores, churches, theaters, schools and other buildings in its heating range. Extra heavy riveted steel to withstand severe service. See table above for specifications. Complete specifications and rating on request.

For New House Work

For the smaller better-insulated homes now being built, Lennox also makes a complete line of low-priced equipment for all fuels. Full information on request. Also a complete line of gravity furnaces and burners for all fuels.

THE MEYER FURNACE COMPANY

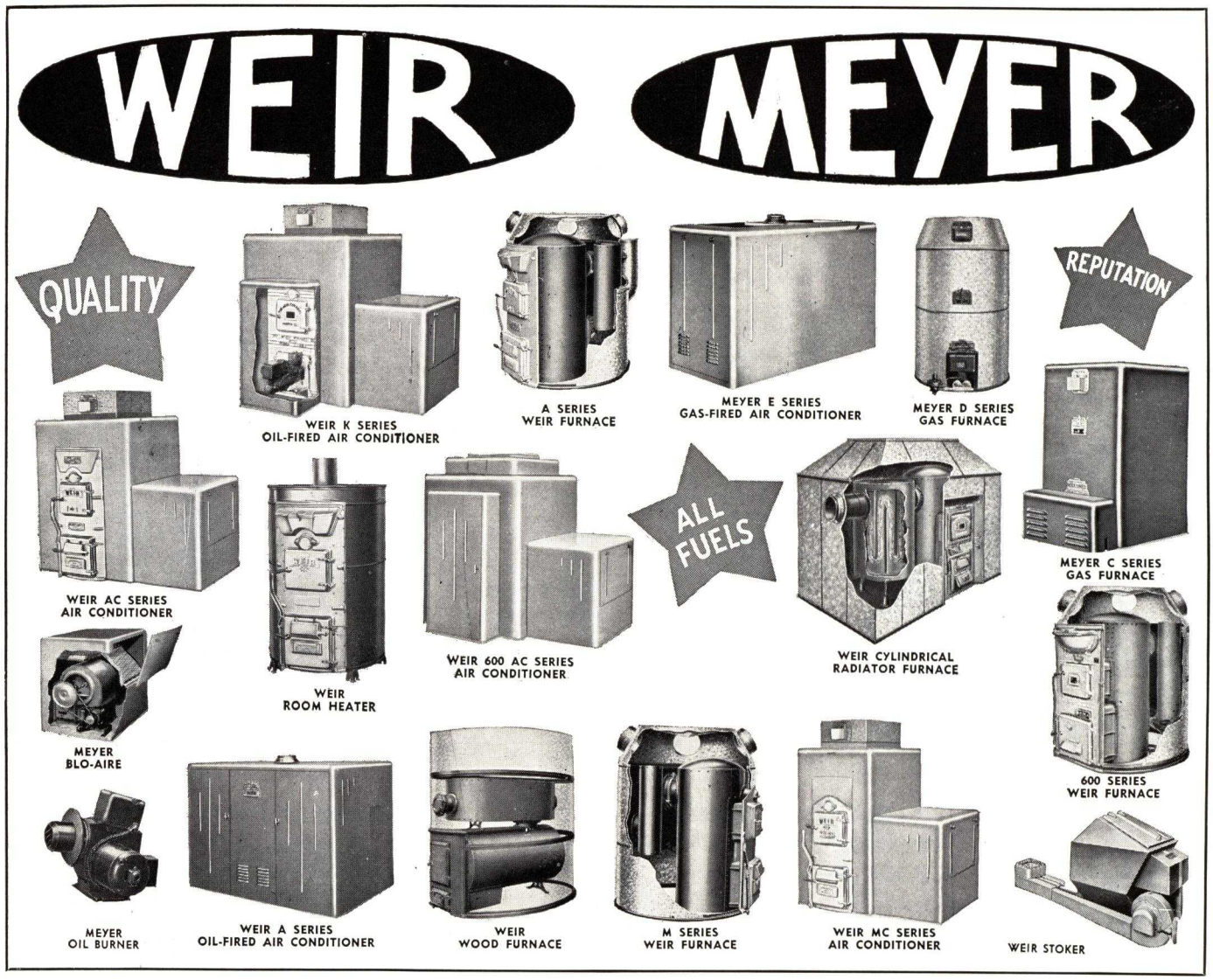
Manufacturers of Weir and Meyer Steel Furnaces and Domestic Air Conditioning Appliances

PEORIA, ILL.

BRANCHES AND DISTRIBUTORS IN PRINCIPAL CITIES

WARM AIR AND AIR CONDITIONING EQUIPMENT FOR ALL FUELS

Modern and Complete *Since 1866*



There is a WEIR or MEYER unit for every type of job from the modest home where heating is the prime requisite and economy the watchword, to the finest home with all modern appliances which include at least winter air conditioning and possibly summer cooling, and whether the fuel preference be coal, oil or gas.

If it is true (and we believe it is) that *there is no substitute for experience,* then the fact should be important that WEIR/MEYER products have behind them an enviable record of a great many years of heating experience — pioneering steel construction which is generally preferred today — combined with a reputation for quality and leadership.

We shall be glad to have you submit plans for your next residential project to our Engineering Department for preparation of a heating lay-out which will be made without obligation.

Shipments made promptly from conveniently located stocks.

Complete Architect's Portfolio
"Modern Heating and Air Conditioning"
(72 pages of descriptive and technical data)
upon request without cost.

"Who Makes It Makes a Difference"

MAY OIL BURNER CORPORATION

Manufacturers of the Quiet May "Heat-an-Aire" Conditioner, the Quiet May Oil Furnace and the Quiet May Oil Burner

FACTORIES AND GENERAL OFFICES
BALTIMORE, MD.
NEW YORK OFFICE, 331 MADISON AVENUE

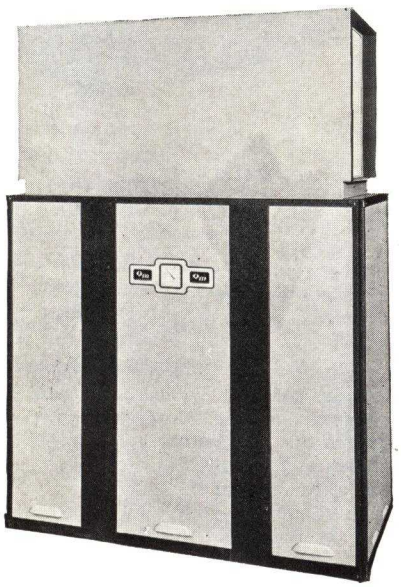
QUIET MAY "HEAT-AN-AIRE" CONDITIONER (OIL FIRED)—SERIES 4

Purpose

Quiet MAY "Heat-an-Aire" Conditioners, Series 4, are designed for combined (also called "split") heating systems which employ both direct radiation and air-conditioning, or for systems that involve only conditioned air heating.

Three sizes are available to fulfill a wide range of heating and air-conditioning requirements. Each unit consists of a Quiet MAY Oil Furnace—which includes a tankless heater providing all-year domestic hot water—and an air-conditioner. Installation is possible in existing structures containing duct distribution systems and also in new buildings.

Units are completely enclosed in an insulated cabinet of furniture steel, enameled in gray and black trimmed. All panels forming the cabinet are independently removable for inspection of the burner mechanism or other parts.



Description

A heating plant and an air-conditioning chamber are combined in the Quiet MAY "Heat-an-Aire" Conditioner units to provide a wide range of flexibility for winter air conditioning.

The Heating Plant—A Quiet MAY Oil Furnace that supplies steam which, for a combined system, is delivered partly to mains supplying radiators or convectors and partly to heat transfer coils within the conditioning chamber. In an all-air heating system, all the steam is delivered to the coils.

Domestic hot water is supplied by a tankless heater submerged in the oil furnace and large enough to utilize the full output of the boiler. Sufficient supply and proper temperature of domestic hot water is maintained by an aquastat. An automatic tempering valve may be specified.

The Air-conditioning Chamber—Contains extended fin-type heat transfer coils supplied with steam from the furnace and located in the supply duct. Air-conditioning is completed by the following:

(1) *Air Circulation* is assured by a quiet, low-speed centrifugal blower. Fan speed can be varied by adjusting pulley.

(2) *Air Cleaning* is accomplished through replaceable filters in the return air intake, thus assuring the cleansing of both outside and re-circulated air.

(3) *Humidification* is provided by a spray type atomizer, automatically controlled by a humidistat operating a solenoid valve on the water supply line. The atomizer is mounted directly in the path of the air stream. Cold water is used, thereby lessening the possibility of stoppage.

(4) *Summer Comfort* is aided by use of fan and filters to provide circulation of cleaned, unheated air without interfering with domestic hot water heating in summer.

(5) *Room Temperatures* are controlled by a low-voltage room thermostat which governs the operating controls. Upon a call for heat, the oil burner starts. Operation of the fan is delayed unless the air-conditioning chamber contains heat.

How To Select Proper Size

Total heat loss from the building should be calculated room by room as usual and expressed in B.t.u. per hour.

The Combined System—Supplies conditioned warm air through ducts to some rooms and heats others by radiators or convectors. In general, radiation should be used in rooms from which objectionable odors or gases might be re-circulated or wherever conditioned air is not needed.

(1) For heat supplied through radiators or convectors add 70%, for piping loss and pick-up load, to the calculated radiation requirements to obtain the total direct radiation load in B.t.u. per hour.

(2) For warm air heating through ducts add 25%, for duct losses, to the calculated warm air requirements to obtain the total warm air load in B.t.u. per hour.

(3) The total B.t.u. load on the unit is the sum of the loads calculated for direct radiation and warm air.

(4) Refer to Table I (page 3) "Selection Data". If air temperature is to be 120°F. at register, tentatively select from line 2 a unit with capacity equal to or greater than the total warm air load. If register temperature is to be 130° F., make selection from line 4. Check selection thus made with line 1 to assure proper total capacity.

"All-air" Systems—Require no calculation for direct radiation.

(1) To the total heat losses of all air-conditioned rooms add 25% for duct losses to obtain the total warm air load in B.t.u. per hour.

(2) From Table I select a unit with a capacity equal to or greater than the calculated requirements. For register temperature of 120°F. make selection from line 2. For a temperature of 130°F. use line 4.

Domestic Hot Water Loads

Note that no allowance for domestic hot water supply need be made in determining loads on boiler. This is due to the fact that the automatic control of the tankless heater does not permit the boiler to be taxed simultaneously by the heating load and the domestic hot water load. Check the domestic hot water requirements in gallons per hour for 90°F. rise; if it does not exceed the capacity indicated for the selected boiler on line 6, Table I (page 3) an ample supply is assured. If abnormal domestic hot water loads must be served, a submerged tank heater may be specified, but in this event the advantages of the Quiet MAY Tankless Heater are lost and the domestic hot water load in B.t.u. must be added to the heating loads when determining the total required boiler output. In such cases, see line 10, Table I.

Design of Duct System

The duct system, consisting of supply and return ducts, should be designed in the normal manner, with a total resistance pressure not exceeding ¼-in. of water for any unit. Fan speed and air volume can be modified to provide the desired cubic feet per minute air delivery at grille outlet temperatures down to 120°F., by means of the adjustable pulley. This adjustment and the balancing of the system are part of the duct installation contract.

Engineering Service

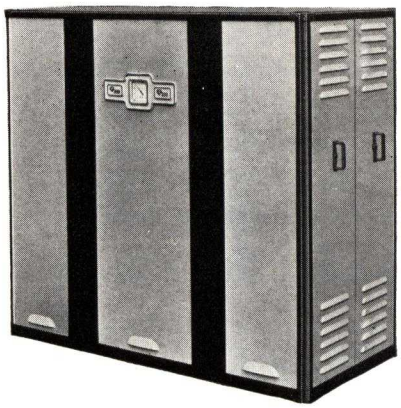
Architects are invited to submit drawings of new or existing projects for complete engineering service. Communicate direct with factory, or authorized dealer.

QUIET MAY OIL FURNACE—TYPE LCT

Purpose

Quiet MAY Oil Furnaces are made in three sizes, designed to furnish heat and domestic hot water for any type of steam, vapor or hot water heating system. They may also be used to supply heat in conjunction with a separate air conditioner.

Each unit, consisting of furnace, oil burner, integral tankless domestic hot water heater and automatic controls, is completely enclosed in an insulated furniture steel cabinet, enameled in gray and black.



Description

A heat generator and a heat absorbing system are combined in Quiet MAY Oil Furnaces to provide a complete well-balanced unit.

The Heat Generator—A development of the successful Quiet MAY Oil Burner. This burner is of pressure atomizing type, electrically ignited, and equipped with a sapphire-jeweled atomizer and patented Gerotor pump. These latter features, characteristic of Quiet MAY Oil Burners, are designed to eliminate wear at the two most critical points. The lowest priced domestic grade fuel oil is recommended.

The Heat-absorbing System—Consists of three parts: (1) the Ther-May-Lator forming the combustion chamber, (2) a water jacket completely surrounding the combustion chamber and (3) a series of fire tubes just under the steam space at the top of the boiler. The Ther-May-Lator is formed by bonding tile in heat conducting contact to the water backed bottom section of the boiler and to a water tube running the length of the boiler at the top of the combustion chamber. This design imparts heat to the water in the boiler almost instantaneously when the burner starts and provides a quick pick-up with little or no lag. The Ther-May-Lator is completely refracted at the factory.

The same boiler is used for either steam or hot water radiation systems. For the latter type of system, steam is generated in the normal manner, but its heat is immediately absorbed by a transfer heater that is placed behind the boiler. A steam supply and return line is run to this heater.

The transfer heater consists of a series of steel tubes expanded into headers and through which water, serving the radiation system, circulates independently of the boiler water. With the exception of this transfer heater there is no difference between the steam and hot water boiler.

Domestic Hot Water—Supplied by an integral tankless hot water heater, a series of copper coils immersed in the boiler water and of sufficient size to make use of the entire boiler heat output. No storage tank is required, nor is it necessary to add hot water loads to radiation loads in sizing boilers.

Controls

Aquastat—Maintains domestic hot water in sufficient supply, summer and winter. The aquastat is uniquely placed, within the tankless heater tubes and controls the operation of the burner when heat for domestic hot water is needed. A tempering valve, which automatically maintains constant temperature by admitting cold water into the hot water stream when the hot water temperature rises above a predetermined point, may be specified.

Room Thermostat (Low Voltage Type)—Governs room temperatures by starting or stopping the burner through a relay which is interconnected with a series of automatic operating controls.

Domestic hot water and room temperature controls operate independently, providing either hot water or heat, as required.

How to Select Proper Size

Total heat loss from the buildings should be calculated, room by room, as usual and expressed in B.t.u. per hour.

(1) If heat is supplied entirely to direct radiators or convectors, add for piping loss and pick-up load the allowance indicated in Table V, (page 3) to obtain the gross total load on the unit in sq. ft. radiation.

(2) Select the proper Quiet MAY Oil Furnace from line 2 or 3, Table III (page 3), "Selection Data." If the required output falls between the capacities of two furnaces, always select the larger.

Domestic Hot Water Loads

Note that no allowance for domestic hot water supply need be made in determining loads on boiler. This is due to the fact that the automatic control of the tankless heater does not permit the boiler to be taxed simultaneously by the heating load and the domestic hot water load. Check the domestic hot water requirements in gallons per hour for 90°F. rise; if it does not exceed the capacity indicated for the selected boiler on line 4, Table III (page 3), an ample supply is assured. If abnormal domestic hot water loads must be served, a submerged tank heater may be specified, but in this event the advantages of the Quiet MAY Tankless Heater are lost and the domestic hot water load must be added to the heating loads when determining the total required boiler output. In such cases refer to line 7, same table.

Engineering Service

Architects are invited to submit drawings of new or existing projects for complete engineering service. Communicate direct with factory, nearest branch office or authorized dealer.

QUIET MAY CONVERSION OIL HEATING SYSTEM

Purpose

Quiet MAY Conversion Oil Heating equipment is designed to convert existing boilers of any type into oil heating systems and to increase efficiency in operation. The equipment includes Quiet MAY Oil Burners, Quiet MAY Ther-MAY-Lators and Econ-O-MAY Inserts. The last two are units designed to assure maximum effectiveness from oil heating installed in plants originally designed for other fuels. Quiet MAY equipment makes possible the conversion of vertical or horizontal steam or hot water boilers.

Description

Quiet MAY Oil Burners are available in six models and five optional colors to meet every type of oil heating condition. All are of the electrically ignited oil-pressure atomizing type. Equipment on each model includes:

(1) Self-cleaning oil filter of non-corrosive metal alloy.

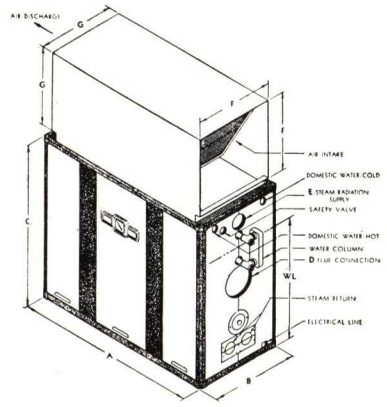
(2) Duplex valve that automatically regulates oil flow and prevents fuel wastage.

(3) Double sapphire-jeweled atomizer.

(4) Quiet MAY Gerotor oil pump.

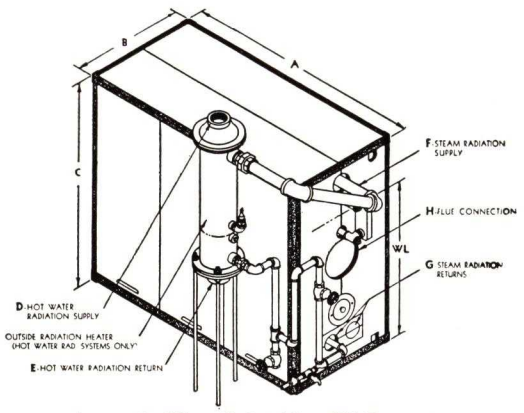
The two last features, characteristic of Quiet MAY oil burners, are designed to eliminate wear at the two most critical points and thus to maintain the high efficiency of the unit. The lowest priced domestic grade fuel oil is recommended.

SPECIFICATIONS AND DIMENSIONS—SELECTION DATA



Isometric View Quiet May "Heat-an-Aire" Conditioner

QUIET MAY



Isometric View Quiet May Oil Furnace (Rear)

QUIET MAY "HEAT-AN-AIRE" CONDITIONER (OIL FIRED) SERIES 4

TABLE I - SELECTION DATA		MODEL NUMBER			NOTES
LINE	DESIGNATION	41 - 90	42 - 90	42 - 120	
1	Total Capacity - Btu output per hour	110,000	160,000	160,000	1. Total capacity is output of Boiler
2	Max. Btu per hr. to air at Conditioner (Temperature at Registers 120° F.)	90,000	90,000	120,000	
3	C. F. M. at above Btu Output	1,325	1,325	1,775	
4	Max. Btu per hr. to air at Conditioner (Temperature at Registers 130° F.)	75,000	75,000	100,000	2. Difference in Btu between Total Capacity and Btu used for heating air (Line 2) may be used for radiation heating
5	C. F. M. at above Btu Output	950	950	1,250	
6	Domestic Hot Water—Gal. per hr. at 90° Rise	150	180	180	
7	Size of Blower Motor in H.P.	1/6	1/6	1/4	
8	Standard Atomizer	W1.3	1.5	1.5	
9	Shipping weight in lbs. (approx.)	1,750	2,050	2,075	
10	If Quiet May Tank Heater is used				3. Total static pressure (in duct system) for all units excluding conditioner is 1/4" of water
	Capacity in Gals.—Max. coil rating 2 hr. run at 90° F. rise	40	60	60	
	Load on boiler to be added to heating load - EDR Steam	65	100	100	
11	Humidifier Capacity—lbs. hr. Continuous Operation	10	10	14	
TABLE II - DIMENSIONS					4. Boiler units designated as Nos. 41 and 42
A	Length of Cabinet	57"	57"	57"	
B	Width of Cabinet	27"	27"	27"	
C	Height of Cabinet	76¼"	79½"	79½"	5. Air units designated as Nos. 90 and 120
D	Diameter of Flue Connection	8"	8"	8"	
E	Size of Steam Supply	1-3"	1-3"	1-3"	
F	Size of Air Intake {Vertical Dimension first / Area	24" x 24⅞" / 597 sq. in.	24" x 24⅞" / 597 sq. in.	24" x 24⅞" / 597 sq. in.	6. Line 8 gives standard atomizer used and is not rated oil input
G	Size of Air Discharge to System {Vertical Dimension first / Area	24" x 24⅞" / 597 sq. in.	24" x 24⅞" / 597 sq. in.	24" x 24⅞" / 597 sq. in.	
WL	Height of Water Line	37¼"	40½"	40½"	
	Minimum Door Width for Admittance	20"	20"	20"	

QUIET MAY OIL FURNACE—TYPE LCT

TABLE III - SELECTION DATA		MODEL NUMBER		
LINE	DESIGNATION	S460-W735	S660-W1050	S1000-W1600
1	Total Capacity Btu Output per hr.	110,000	160,000	240,000
2	Total Capacity EDR Steam	460	660	1,000
3	Total Capacity · EDR Hot Water	735	1,050	1,600
4	Domestic Hot Water - Gal. per hour at 90° rise	150	180	325
5	If Quiet May Tank Heater is used			
	Capacity in Gals. Max. coil rating 2 hr. run at 90° rise	40	60	100
	Load on boiler (add to heating load) {EDR Steam	65	100	165
	{EDR Hot Water	105	165	265
6	Standard Atomizer	W1.3	1.5	2.3
7	Shipping weight in lbs. {Steam	1,375	1,625	2,300
	{Hot water—including O.R.H.	1,475	1,750	2,450
TABLE IV- DIMENSIONS				
A	Length of Cabinet	57"	57"	63"
B	Width of Cabinet	27"	27"	33"
C	Height of Cabinet	49¾'	53"	61"
D	Size of Hot Water Radiation Supply	1 - 2½"	1 - 3"	1 - 3"
E	Size of Hot Water Radiation Return	1 - 2½"	1 - 3"	1 - 3"
F	Size of Steam Radiation Supply	1 - 3"	1 - 3"	1 - 4"
G	Size of Steam Radiation Returns	2 - 2"	2 - 2½"	2 - 3"
H	Diameter of Flue Connection	8"	8"	10"
J	Min. Overall Length Hot Water Boiler with O.R.H.	69¼"	69¼"	75¼"
K	Min. Overall Width Hot Water Boiler with O.R.H.	41⅛"	41⅝"	45⅞"
WL	Height of Water Line	37¼"	40½"	46½"
	Minimum Door Width for admittance	20"	20"	22"

TABLE V

Piping Loss and Pick-up Loads	
Total Standing Load in EDR	% to be Added
100 — 300 sq. ft.	75
301 — 450 sq. ft.	70
451 — 700 sq. ft.	65
701 — 1,250 sq. ft.	60
1,251 — 4,000 sq. ft.	55
4,001 — 10,000 sq. ft.	50

NOTES

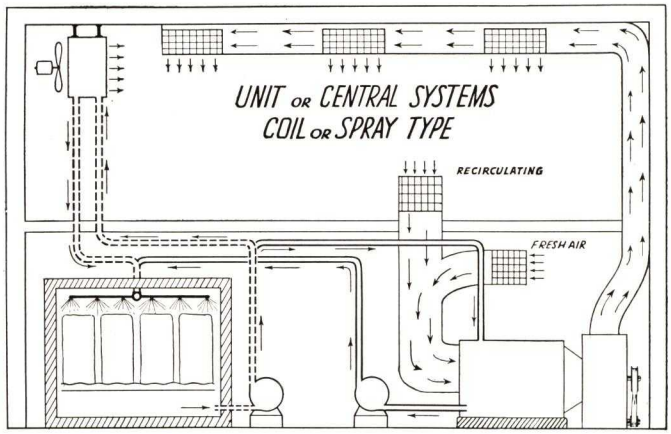
1. Shipping weights are approximate.
2. Line 6 shows standard atomizer used and not rated oil input.
3. Steam Furnaces are designated by letter "S" prefixed to model number. Hot Water Furnaces by letter "W".

NATIONAL ASSOCIATION OF ICE INDUSTRIES

Air Conditioning (Portable and Permanent Units)

228 No. La. Salle Street, CHICAGO, ILLINOIS

For Refrigeration Units, see File Index



On the left is shown a typical "Unit" ice cooling system; on the right a typical Central system. Either can be of the coil or spray type.

A Portable Room Cooler is ideal for cooling a small office, bedroom, etc. Self-contained; can be easily moved from one room to another.

Ice is an ideal refrigerant for air-conditioning—safe, silent, efficient, economical. Any establishment not requiring air conditioning on a 24-hour basis will find ice to be an almost perfect medium for comfort cooling. An ice installation for summer comfort cooling may be readily and economically combined with heating and humidifying equipment to secure year 'round air conditioning. The many installations in use today include *apartments, churches, funeral parlors, homes, offices, railway passenger cars, restaurants, shops, stores and theatres.*

EFFICIENCY

The cold water produced from ice in an insulated bunker is circulated through a fin or spray type air-conditioning unit. The insulated bunker prevents meltage during off-periods and preserves the ice for its air-conditioning work. Once the piping is filled at the start of the season no additional water is required. The constant supply of fresh water from the melted ice is particularly desirable in a spray type system. When the system is not in operation, ice placed in the insulated storage chamber will last for days without perceptible meltage.

SIMPLICITY

An ice bunker and a pump are the entire refrigeration system. There are no compressors, condensers, evaporating coils, cooling towers, transformers, etc. This simplicity cuts down initial investment, overhead and operating costs, besides providing greater protection against interruption of service.

CONVENIENCE

The touch of a button starts an ice system functioning —just enough ice is melted to supply the needed refrigeration and no more. The simplicity of the system reduces the servicing problem to a minimum. The unit requires no technically trained attendant, nor does it require frequent servicing by a licensed engineer.

FLEXIBILITY

All air-conditioning systems should operate without noticeable temperature change despite wide variation in the refrigeration requirement. Thus, flexibility is a most important consideration. The ice system operates economically as changing requirements of weather or other conditions demand. It can be operated at twice the normal demand and then will drop to one-tenth of its rated capacity with ease and economy. As opposed to this, the capacity of other types of equipment is fixed at the time of installation.

COST

The initial investment in an ice system is relatively low and the equipment is easily installed because there is no complicated machinery. There is little to get out of order and slight need for attention in an ice installation equipped with thermostatic control. Thus, the first low cost of the melting tank and equipment, the relatively slight installation cost, the negligible cost of cooling water, the negligible maintenance and slight depreciation combine to give lower fixed costs.

The Technical Department of the National Association of Ice Industries offers information, without charge or obligation, to any one interested in air-conditioning . . . Or consult your local ice company.

L. J. MUELLER FURNACE CO.

Manufacturers of Heating and Air Conditioning Equipment

2007 West Oklahoma Avenue, MILWAUKEE, WIS.

ST. LOUIS, MO., 4246 Forest Park Blvd.
BALTIMORE, MD., 123 Market Place
KANSAS CITY, MO., 3337 Highland Ave.
OMAHA, NEB., 1718 Cass St.
MEMPHIS, TENN., 1128 Sterrick Bldg.
MINNEAPOLIS, MINN., 3626 So. Harriet Ave.
LOS ANGELES, CAL., 3318 W. 48th St.
PHILADELPHIA, PA., Delaware Ave. and Morris St.
PITTSBURGH, PA., 405 W. Warrington Ave.
DALLAS, TEX., 1903 Michigan St.
SALT LAKE CITY, UTAH, 1565 Park St.

MUELLER CLIMATROL AIR CONDITIONING FURNACE

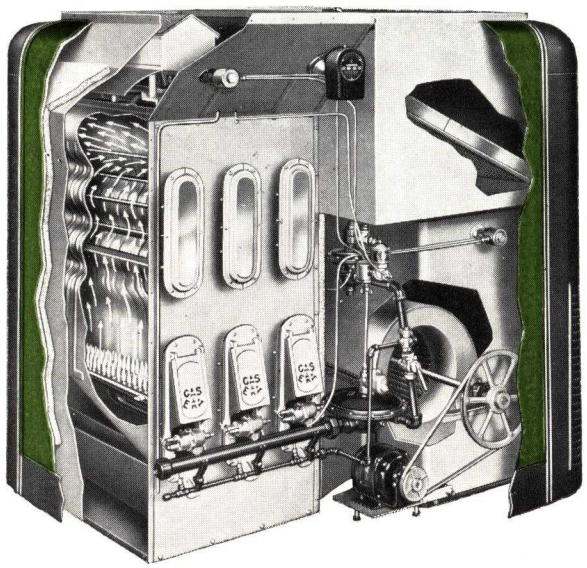
Enclosed in the handsome, ultra-modern cabinet are the gas-fired heating unit, the fan, automatic humidifier and air filters, together with controls necessary for completely automatic operation.

Mueller "Heat Speeder" sections are constructed of two half-sections, die-stamped from copper-bearing steel sheets, cold-rolled to Mueller specifications. The two halves are electrically seam-welded into a one-piece, gastight, air pressure-tested section. This design secures a rapid and high rate of heat transfer, and eliminates traps and pockets.

Each section has individual burner, specially designed to co-ordinate with the combustion chamber in obtaining complete combustion, uniform flame distribution and quiet operation. A safety shutoff on each burner makes the escape of unburned gas impossible.

The powerful Mueller Fan draws return air through the filters, then delivers the filtered, humidified, warm air uniformly to all rooms. Filters of ample area to do a thorough job of cleaning the air are provided. Controlled humidity is supplied automatically by the Mueller Spray Type Humidifier; where humidistat control is not desired, humidity is supplied by the Mueller Automatic Air Moistener.

Controls to suit installation requirements are available. They may include plain or clock type room thermostats, or modulating gas control which secures continuous heat flow, regulated to weather conditions, and turns the gas flame up or down as required to maintain the desired temperature.



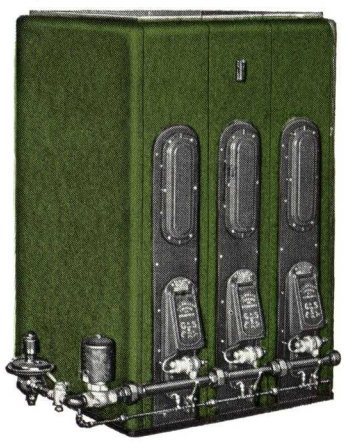
Unit No.	A.G.A. input rating	Total load B.t.u. per hour	*C.f.m. delivery	Length, in.	Depth, in.	Height, in.
FS-2	90000	66000	1200	48	46	60
FS-3	135000	99000	1800	56	46	60
FS-4	180000	132000	2400	66	46	64
FS-5	225000	165000	3000	83	46	66
FS-6	270000	198000	3600	91	46	66

*Capacities shown are for delivery against maximum resistance encountered on conventional systems, which vary with size.

Detailed data covering fan performance and motor horsepowers furnished upon request.

SERIES "E" GAS ERA STEEL FURNACE

The distinctive advantages of gas heating—cleanliness, dependability, convenience, quiet operation—are achieved in the Mueller Series "E" Gas Era Furnace.



The heating unit consists of the required number of "Heat Speeder" steel sections to handle the heating requirements. These sections, which are the same as in the Mueller Climatrol, give instant heat response, maximum service, low operating cost, and produce no temperature overrun. Humidity is supplied by Mueller automatic air moistener.

Series "E" furnaces are of multiple unit construction, permitting the assembly of the number of sections required for each job. These furnaces may be installed with Climator Fan-Filter units as forced air systems, or for gravity operation. Climator units are illustrated and described on page 5.

Furnace No.	A.G.A. input rating	*Total load B.t.u. per hour	Height, in.	Depth, in.	Width, fan casing, in.	Width, gravity casing, in.	Gas valve, in.	Gas pressure regulator, in.
E-1-S	45,000	33,000	54	31½	12¾	22¾	¾	¾
E-2-S	90,000	66,000	54	31½	22¾	42¾	¾	¾
E-3-S	135,000	99,000	54	31½	32¾	62¾	¾	¾
E-4-S	180,000	132,000	54	31½	42¾	82¾	1	1
E-5-S	225,000	165,000	54	31½	52¾	102¾	1	1¼
E-6-S	270,000	198,000	54	31½	62¾	122¾	1	1¼
E-7-S	315,000	231,000	54	31½	72¾	142¾	1	1¼
E-8-S	360,000	264,000	54	31½	82¾	162¾	1¼	1¼
E-9-S	405,000	297,000	54	31½	92¾	182¾	1¼	1¼
E-10-S	450,000	330,000	54	31½	102¾	202¾	1¼	1¼

*Net connected load.

MUELLER GAS ERA ALL CAST FURNACE

For those who prefer a gas furnace with cast iron heating unit, the Mueller Gas Era line includes a furnace of this type. It easily meets every requirement for rugged durability, dependability, quiet operation and operating efficiency.

The cabinet is of pleasingly modern design, with enclosed manifold and furnace front. Removable grilles provide ready access.

Furnaces are of multiple unit design, permitting the installation of the number of sections required for each individual job.

Healthful moisture is supplied automatically by the Mueller Automatic Air Moistener regularly furnished.

The addition of a Mueller Climator unit (see page 5) provides the advantage of forced air distribution and air cleanliness at practically the same operating cost as for heating alone. In gravity installations, heating units are spaced on wider centers than where a fan is employed, providing adequate free area within the casing for gravity warm air circulation.

Control equipment, including a choice of thermostats, to provide automatic operation, is available.

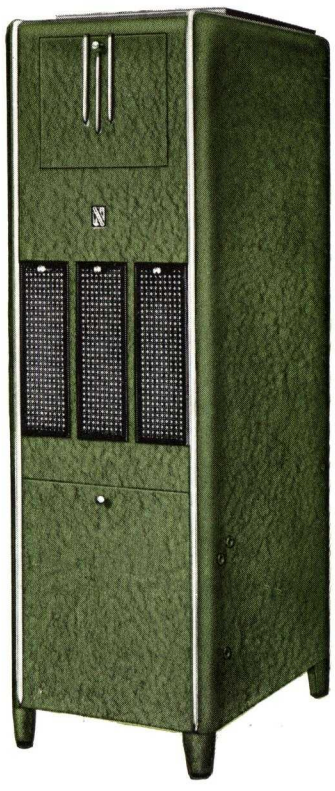
Cast Iron Heating Sections

In principle of design, the heating sections are similar to Gas Era "Heat Speeder" sections, except that they are of cast iron construction. The half-sections are surface ground and bolted iron-to-iron, assuring permanently tight joint. The exterior surface is heavily ribbed and corrugated, increasing the heating surface and strengthening the unit. Triangular baffles hold products of combustion in close contact with the surface of the castings, securing maximum heat transfer.

RATINGS AND DIMENSIONS

Furnace No.	A.G.A. input rating	B.t.u. total load per hour	Height, in.	Depth, in.	Width, in.	
					Forced air	Gravity
1	65,000	47,500	54	38	$14\frac{3}{4}$	$24\frac{7}{16}$
2	130,000	95,000	54	38	$26\frac{3}{4}$	$46\frac{1}{8}$
3	195,000	142,500	54	38	$38\frac{3}{4}$	$67\frac{13}{16}$
4	260,000	190,000	54	38	$50\frac{3}{4}$	$88\frac{1}{2}$
5	325,000	237,500	54	38	$62\frac{3}{4}$	$110\frac{5}{16}$
6	390,000	285,000	54	38	$74\frac{3}{4}$	$131\frac{7}{8}$
7	455,000	332,500	54	38	$86\frac{3}{4}$	$153\frac{9}{16}$
8	520,000	380,000	54	38	$98\frac{3}{4}$	$175\frac{1}{4}$
9	585,000	427,500	54	38	$110\frac{3}{4}$	$196\frac{15}{16}$
10	650,000	475,000	54	38	$122\frac{3}{4}$	$218\frac{5}{8}$

MUELLERAIRE GAS-FIRED FORCED CIRCULATION HEATER



Designed for use in stores, shops, showrooms, small factories and similar commercial and industrial applications where the unit is to be installed in the space to be heated, also in residences without basements. Heats, filters and humidifies the air, and distributes it by forced circulation.

Heating units consist of Mueller "Heat Speeder" sections. A Mueller Air Moistener supplies humidity automatically. Fan and motor are located below the heating unit. Return air is drawn at floor level through the filters, is heated and humidified, then discharged through cowl or duct at top of unit. Fan operates only when furnace is in operation.

Furnished in two types—Style "M", shown herewith, finished in green crinkle lacquer, also Style "EPC", with casing finished in green prime coat and with furnace front exposed. Units are shipped completely assembled. All that is necessary is to connect gas, water, electricity and vent, and attach cowl or duct. All controls necessary for automatic operation are supplied.

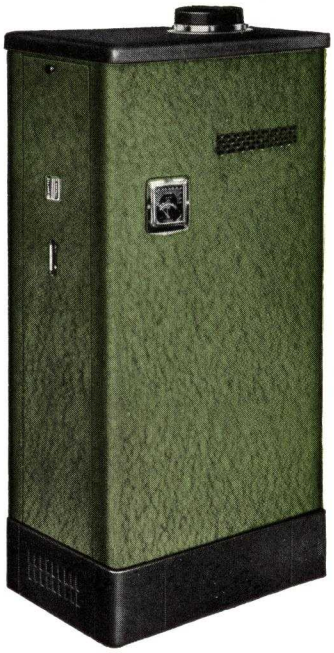
RATINGS AND DIMENSIONS

Style "M" No.	Style "EPC" No.	A.G.A.		*Air delivery, c.f.m.	Style "M"			Style "EPC"			Motor hp.
		Input rating, B.t.u.	Output rating, B.t.u.		Height, in.	†Depth, in.	Width, in.	Height, in.	†Depth, in.	Width, in.	
M-2	EPC-2	90,000	72,000	900	$83\frac{5}{8}$	$38\frac{1}{2}$	$19\frac{1}{2}$	83	$31\frac{1}{2}$	17	$\frac{1}{6}$
M-3	EPC-3	135,000	108,000	1,350	$83\frac{5}{8}$	$38\frac{1}{2}$	$27\frac{1}{2}$	83	$31\frac{1}{2}$	25	$\frac{1}{6}$
M-4	EPC-4	180,000	144,000	1,800	$83\frac{5}{8}$	$38\frac{1}{2}$	$35\frac{1}{2}$	83	$31\frac{1}{2}$	33	$\frac{1}{4}$
M-5	EPC-5	225,000	180,000	2,250	$83\frac{5}{8}$	$38\frac{1}{2}$	$43\frac{1}{2}$	83	$31\frac{1}{2}$	41	$\frac{1}{3}$

*By changing fan speed, air delivery may be regulated. Capacities shown can be secured against duct resistance of .125 in. On special order can be arranged for delivery against higher resistance, or greater air capacity.
†Add 10 in. for vent connection.

MUELLER GAS ERA BOILERS

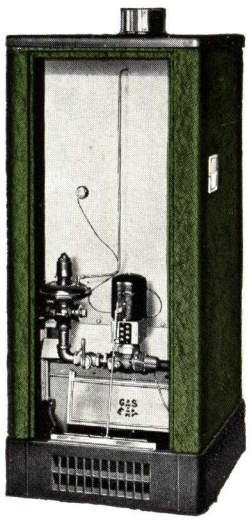
Series A



Mueller Gas Era Boilers are made in Series A and C. They are adaptable to steam, hot water or vapor heating, or to any system of heating or air conditioning employing radiation, convectors, pipe coils, unit heaters or blast heating surfaces. They are also available with controls and storage tanks for automatic hot water supply, either as direct or indirect systems.

They are of standardized sectional cast iron construction, with narrow, smooth, vertical flues, readily accessible for cleaning, if necessary. Designed to operate with a minimum of excess secondary air, and breeching temperature above 212°, eliminates annoying condensation while maintaining high efficiency.

Series A Boilers are made in sizes to handle the requirements of residences and apartments, and for domestic water supply. Smaller sizes are shipped with sections assembled. An attractive, compact cabinet, finished in green crinkle lacquer completely encloses sections, back-draft diverter and controls. Cabinet is completely insulated. A removable panel provides access to burners and controls.



Equipment furnished with all Gas Era Boilers includes insulated metallic cabinet, back-draft diverter, gas pressure regulator, main gas valve, thermostatic safety pilot, pilot gas cock, draw-off cock and flue cleaning brush. Steam ("S") boilers also equipped with electric gas valve with throttling steam pressure regulator, low water cut-off, water gauge and try cocks, retard steam gauge and pop safety valve. Hot water ("W") boilers are equipped with electric gas valve, water temperature limit control, altitude gauge and thermometer.

RATINGS AND DIMENSIONS

Boiler No.	A.G.A. ratings, sq. ft.		G.p.h. hot water 25° rise	Over-all width, inches	Boiler No.	A.G.A. ratings, sq. ft.		G.p.h. hot water 25° rise	Over-all width, inches
	Steam	Hot water				Steam	Hot water		
A-3 S or W	180	290	205	11¾	A-9 S or W	720	1150	835	30½
A-4 S or W	270	430	310	14⅞	A-11 S or W	900	1440	1040	36¾
A-5 S or W	360	575	415	18	A-13 S or W	1080	1730	1250	43
A-6 S or W	450	720	520	21⅛	A-15 S or W	1260	2015	1460	49¼
A-7 S or W	540	865	625	24¼					

Constant over-all height of jacket, 54 in. Constant over-all depth of jacket, 28 in.

Series C

Series C Gas Era Boilers are intended for large residences and commercial and industrial applications.

Converging and semi-revertible flue construction prevents rapid cooling of boiler when burners are off.

Sections have exceptionally large water-holding capacity, yet water line is only 38½ in. in all sizes. Boiler depth in all sizes is 31¾ in., and height 49 in., excluding trim.

Boiler sections are enclosed in completely insulated casing, finished in green crinkle lacquer. Equipment as listed above, under Series A Boilers is regularly supplied.

RATINGS AND DIMENSIONS

Boiler No.	A.G.A. ratings, sq. ft.		Over-all width, in.	Boiler No.	A.G.A. ratings, sq. ft.		Over-all width, in.
	Steam	Hot water			Steam	Hot water	
13 S or W	420	670	15	1123 S or W	4620	7370	93
24 S or W	630	1005	19	1225 S or W	5040	8040	101
25 S or W	840	1340	23	1327 S or W	5460	8710	108
36 S or W	1050	1675	27	1429 S or W	5880	9380	116
37 S or W	1260	2010	31	1531 S or W	6300	10050	124
49 S or W	1680	2680	39	1634 S or W	6720	10720	
511 S or W	2100	3350	46	1838 S or W	7560	12060	
613 S or W	2520	4020	54	2042 S or W	8400	13400	
715 S or W	2940	4690	62	2246 S or W	9240	14740	
817 S or W	3360	5360	70	2450 S or W	10080	16080	
919 S or W	3780	6030	77	2654 S or W	10920	17420	
1021 S or W	4200	6700	85	2858 S or W	11760	18760	
				3062 S or W	12600	20100	

Dimensional Prints on Application

Completely automatic in operation. After the system has been put in operation, no further attention is required. The dependability and positive operation of the controls assure perfect operation of the boiler at all times.

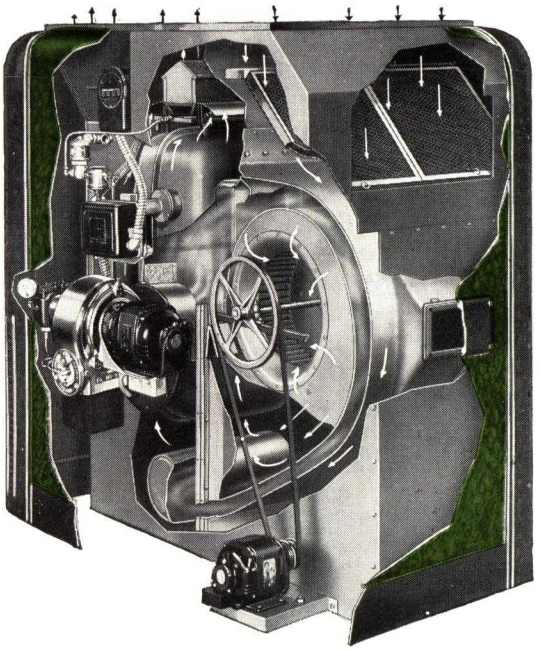
MUELLER OIL-FIRED AIR CONDITIONING FURNACES

Series O

This Mueller Oil-fired Air Conditioning Furnace represents the first complete departure from conventional furnace design in a direct-fired heating and air conditioning plant.

The basic, patented design of this Mueller unit secures a new standard of efficiency and reduced fuel cost. The air passes over the heating surface not once, but three times. Velocity and impingement create a rate of heat transfer impossible in previous designs. The silent fan supplies generous volumes of warm, humidified, filtered air to secure uniform temperatures, and is of sufficient capacity for the addition of complete cooling where desired.

The ultra-modern cabinet, finished in green crinkle lacquer, with chromium trim, completely encloses the heating unit, burner, fan, filters, motor and controls. Removable panels provide ready access.



The pressure atomizing Mueller Oil Burner, specially designed for use with the Mueller Series O Furnace, secures efficiencies and perfection in operation, long sought, but never before achieved. The burner starts quietly and positively, runs smoothly without pulsations, burns the oil completely, stops quietly and smoothly. Oil consumption is suited to heat losses.

The burner, inner construction of the unit, the fire travel, and air travel within the inner housing, are shown in the cut-away view.

RATINGS AND DIMENSIONS

Unit No.	Oil rate gal. per hour	B.t.u. cap. at register	Air delivery, c.f.m. ½ in. S.P. (maximum)	Width, in.	Depth, in.	Height, in.
0–1	0.75 to 1	110,000	2,500	56	37	60
0–2	1.00 to 1.5	165,000	3,750	64	46	60
0–3	1.50 to 2	225,000	5,000	72	57	60

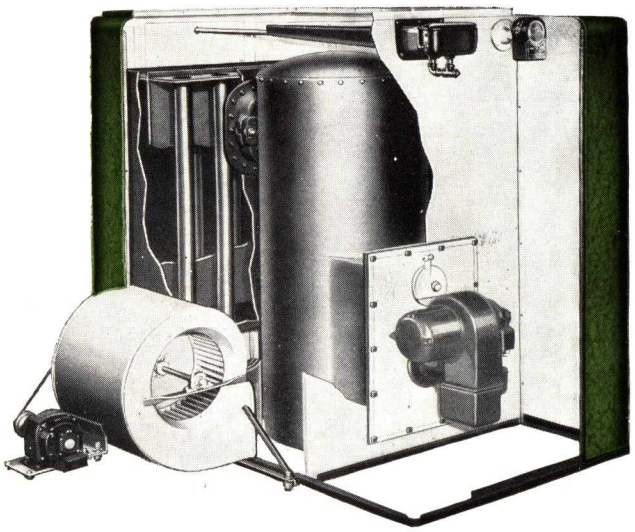
Series Twenty

The Mueller Series Twenty is a compact, efficient, oil-fired heating and air conditioning unit, at a price within the reach of most home-owners. This unit supplies completely automatic heat, plus filtered, humidified, circulated air.

The outer cabinet is finished in green crinkle lacquer, with black and chromium trim, and is completely insulated. An inner housing completely encloses the body of the heater, assuring maximum heat transfer. An extra large radiator provides increased heating surface. Radiator has two rows of tubes, separated by a vertical baffle plate which compels the products of combustion to come in contact with the entire surface of the radiator as well as the tubes.

The oil burner and fan operate only when required to maintain the desired temperature. The fan provides positive distribution of the filtered, humidified, warm air to every room.

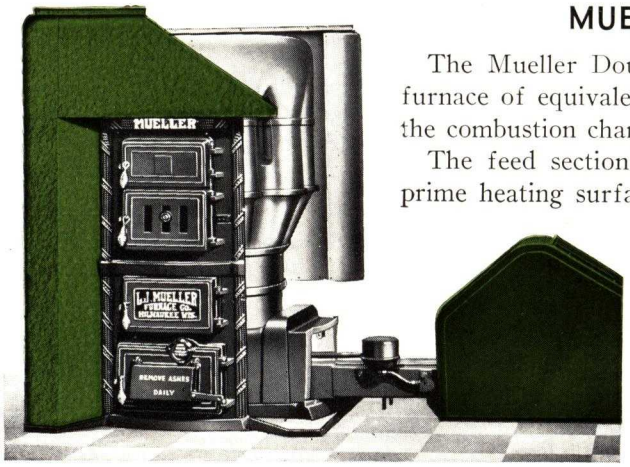
The Series Twenty is available with or without oil burner. Practically any gun type burner may be used, thus permitting the utilization of an existing burner in many instances.



RATINGS AND DIMENSIONS

Furnace No.	B.t.u. available at registers	C.f.m. air deliveries			Width, in.	Depth, in.	Height, in.	Maximum oil rate per hour, gal.
		⅛ in. S.P.	¼ in. S.P.	⅜ in. S.P.				
21	125,000	2200	1400	....	64¾	65½	57½	1.35
22	175,000	2700	2400	2100	64¾	65½	57½	1.65
23	200,000	3800	3600	3150	64¾	72	57½	2.00

MUELLER DOUBLE RADIATOR FURNACE



The Mueller Double Radiator Furnace has more heating surface than any furnace of equivalent grate area. The tubular dome serves also as crown for the combustion chamber, and is surmounted by the circular double radiator.

The feed section is fluted and flaring, adding materially to the amount of prime heating surface. This construction permits the air within the casing to rise freely and circulate around the 20 radiating pipes and double radiator. On fan jobs, this fluted feed section also directs the air to impinge all of the vast amount of heating surface. Grates are triangular duplex type, operated by crank shaker.

Above is shown a Mueller Double Radiator Furnace, enclosed in a square, fan type casing, with automatic stoker connected. This furnace, due to the vertical flue construction, is the only warm air furnace in which fly ash is eliminated and cleaning rendered unnecessary. In addition, the long fire travel and additional heating surface result in maximum heat at lowest fuel cost.

RATINGS AND DIMENSIONS

Furnace No.	Pipe capacity, sq. in.	B. t. u. capacity gravity*	Firepot diam., in.	Grate diam., in.	Floor to center of smoke pipe in.
A-40**	472	64192	20	18	48½
A-44	618	84048	22	19	53
A-48	741	100776	24	22	53
A-52	875	119000	26	24	58
A-54	935	127160	27	24	62
A-60	1152	156672	30	28	62
266 (single door)	1345	182920	33	30	66

*For forced air operation, B.t.u. capacities may be increased 50%.
**Made with single radiator and ten radiating pipes.

MUELLER CLIMATOR FAN-FILTER UNITS

For positive distribution of air in old or new construction, with or without furnaces, in large or small buildings, homes, schools, auditoriums, theatres, factories, or wherever air is to be moved, there is a Climator Fan-Filter unit available.

Fans are designed in accordance with the latest aerodynamic principles. Filters are made of oil-impregnated split steel wire. They may be removed for cleaning, or new pads inserted. Filter area is adequate to handle the air requirements. Fans have ample air delivery capacity for addition of cooling, if desired.

DIMENSIONS AND CAPACITIES

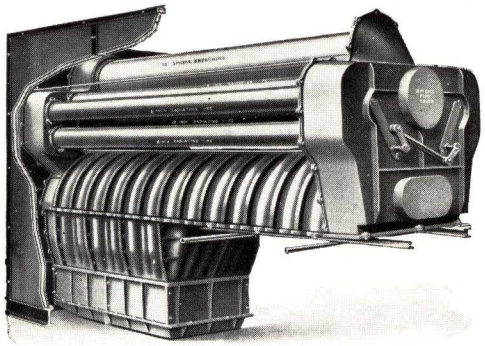
Unit No.	Height, in.	Width, in.	Depth, in.	Maximum c.f.m. capacities for quiet operation							
				⅛ in. S.P.	¼ in. S.P.	⅜ in. S.P.	½ in. S.P.	⅝ in. S.P.	¾ in. S.P.	⅞ in. S.P.	1 in. S.P.
11-S-16	29	27	25¾	1,300	1,125	.....	.....	.....	.....	.....	.....
13A-S-16	34	27	26½	1,350	1,350	950	.....	.....	.....	.....	.....
13A-R-16	35⅝	28	26¾	1,350	1,350	950	.....	.....	.....	.....	.....
13B-S-14	34	31	26¾	1,850	1,850	1,150	.....	.....	.....	.....	.....
13B-R-14	38	32	26¾	1,850	1,850	1,150	.....	.....	.....	.....	.....
15-R-13	45	46	26¾	2,500	2,500	1,750	.....	.....	.....	.....	.....
15-R-12	45	46	26¾	2,500	2,500	2,500	2,350	.....	.....	.....	.....
18-R-12	45	58	26¾	3,600	3,600	1,850	.....	.....	.....	.....	.....
18-R-34	45	58	26¾	3,600	3,600	3,600	3,450	.....	.....	.....	.....
18-R-11	45	58	26¾	3,600	3,660	3,600	3,450	.....	.....	.....	.....
21-R-34	57	70	33	4,850	4,850	4,850	4,300	3,800	3,450	3,300	3,100
21-R-11	57	70	33	4,850	4,850	4,850	4,850	4,600	4,250	4,000	3,800
21-R-32	57	70	33	4,900	4,900	4,900	4,900	4,900	4,900	4,900	4,350
24-R-34	62	72	38	6,300	6,100	5,300	4,600	3,900	3,450	3,100	.....
24-R-11	62	72	38	6,300	6,300	6,250	5,550	4,900	4,500	4,100	.....
24-R-32	62	72	38	6,300	6,300	6,300	6,300	6,300	6,100	5,750	54,00
24-R-21	62	72	38	6,300	6,300	6,300	6,300	6,300	6,300	6,250	56,50

Explanation of numbering: First number indicates wheel diameter. "S" indicates housing with square upright corners and radiused top, and top access door. "R" indicates housing with all corners radiused, and access doors on opposite sides. Last number indicates motor horsepower, i.e. 16 means ⅙ hp., 34 means ¾ hp., and 32 means ½ hp.

The Climator line includes Climator III, a combination fan, air filter and air washer, enclosed in a compact housing of attractive design and finish. It is made in one size only, measuring 37 in. wide, 36 in. deep and 42 in. high. A variable speed sheave permits air delivery capacities as listed in table herewith.

Fan r.p.m.	Cubic feet per minute		
	⅛ in. S.P.	3/16 in. S.P.	¼ in. S.P.
400	1125	550	....
425	1325	775	....
450	1525	950	575
475	1700	1225	800
500	1875	1425	1000
525	2000	1650	1175

MUELLER HORIZONTAL TUBULAR HEATERS



Nos. 93, 94, 95

For forced air heating or air conditioning installations in schools, churches, public buildings, garages, factories and similar buildings.

Bodies are extra heavy corrugated cast iron sections, securely connected and sealed by cup joints. Firebox sides are provided with heavy perforated cast iron liners. $\frac{3}{16}$-in. lap-welded wrought well casing is used for heater tubes. They are connected to front and rear receivers with gaskets and glands to provide for independent expansion of heater body and tubes. Grates are of rocking and dumping type, front and rear grates operated by individual shakers.

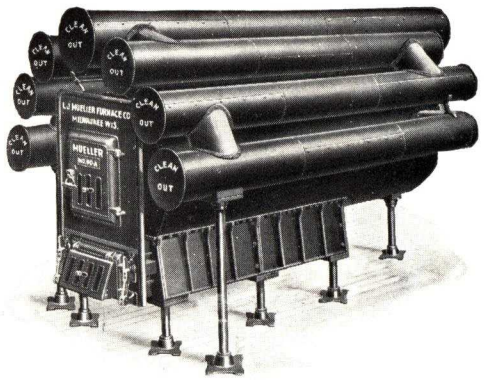
Can be furnished with T-bars for brick setting, or with insulated steel casing.

These furnaces are adaptable for use with coal, oil or gas, and are particularly suited to stoker installations. Efficient and economical with any fuel.

Furnace No.	B.t.u. capacity per hour	Grate area, sq. ft.	Heating surface, sq. ft.	Firebox, in.	Length, in.	Width, in.	Height, in.
93	1,188,000	10	419	42x74	110	72	95
94	1,290,000	10	455	42x74	130	72	96
95	1,390,000	10	491	42x74	150	72	96

Nos. 80-A and 90-A

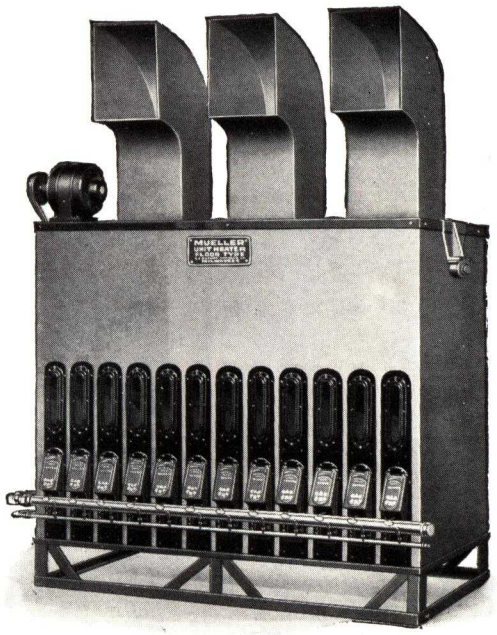
These furnaces are suited to buildings of the types listed above, but which do not require a heating plant of as large capacity. Bodies are made of 10-gauge boiler plate, with cast front and rear heads. The interior is protected by cast liners. Furnished with T-bars for brick setting, or with insulated steel jacket.



Furnace No.	B.t.u. capacity per hour		Grate area, sq. ft.	Heating surface, sq. ft.	Length, in.	Width, in.	Height, in.
	Gravity	Forced air					
80-A	375,000	550,000	6.53	194	69	67	73
90-A	500,000	750,000	9.2	244	92	67	73

MUELLER UNIT HEATERS

The Mueller Gas-fired Unit Heater is particularly suited to large space heating requirements, such as factories, warehouses, auditoriums, skating rinks, hangars, indoor tennis courts, armories, dance pavilions, and similar buildings, usually having no basement. They are also adaptable for special industrial applications, such as seed drying, etc. While shown in floor mounted type, suspended type is available, with necessary modification in design. Discharge cowls may be any height and warm air directed in any direction. The heating unit consists of Mueller Heat Speeder sections, same as in Gas Era Steel Furnaces. Quick, economical heat is assured, with continuous or intermittent operation, as required. No steam piping—therefore no freeze-ups.



DIMENSIONS AND CAPACITIES
With Standard 13-in. Fans

No.	A.G.A. input rating B.t.u.	A.G.A. output rating B.t.u.	Air delivery c.f.m.	Dimensions, excluding manifold			Number of fans and outlets
				Width, in.	Depth, in.	Height, in., excl. cowls, and motor	
U6	270,000	216,000	2,500	51	31½	79	1
U7	315,000	252,000	3,750	59	31½	79	2
U8	360,000	288,000	3,750	67	31½	79	2
U9	405,000	324,000	5,000	75	31½	79	2
U10	450,000	360,000	5,000	83	31½	79	2
U11	495,000	396,000	5,000	91	31½	79	2
U12	540,000	432,000	7,500	99	31½	79	3
U13	585,000	468,000	7,500	107	31½	79	3
U14	630,000	504,000	7,500	115	31½	79	3
U15	675,000	540,000	7,500	123	31½	79	3
U16	720,000	576,000	7,500	131	31½	79	3
U17	765,000	612,000	7,500	139	31½	79	3
U18	810,000	648,000	7,500	147	31½	79	3
U19	855,000	684,000	10,000	155	31½	79	4
U20	900,000	720,000	10,000	163	31½	79	4

Where larger volume of air is to be heated through comparatively small temperature rise, units with same B.t.u. outputs, but 15-in. fans are available—increasing the c.f.m. approximately 50%. Over-all dimensions are slightly larger.

Where desirable, supply and return ducts may be used, rather than discharge cowls and returns at the unit.

RESEARCH CORPORATION

Cottrell Electrical Precipitation Processes, Multiclone Dust Collectors, Coey Multistage Cooling Towers, Calorider Humidity Control

Chrysler Building, NEW YORK

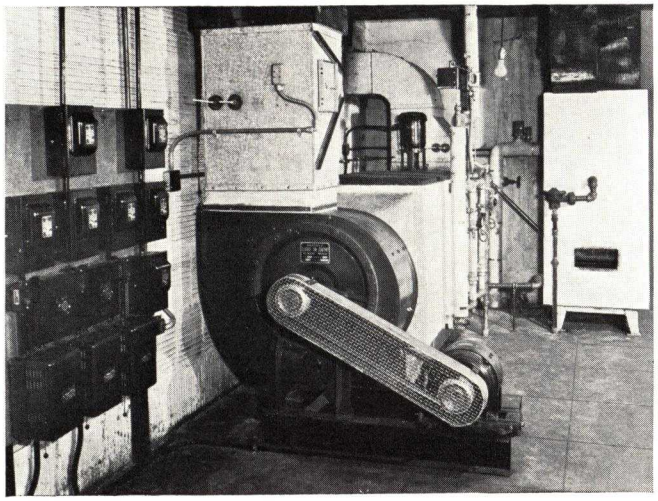
CHICAGO OFFICE: Research Corporation, 59 E. Van Buren Street LOS ANGELES OFFICE: Western Precipitation Co., 1016 W. 9th Street

ENGINEERING SERVICE

THE RESEARCH CORPORATION offers the services of its engineering staff to manufacturers, plant superintendents and engineers to assist them in arriving at the most effective solution of problems involving the recovery or removal of solids or liquids from air or gasses, dust collection, atmospheric water cooling, humidity and air purity control. Past results have demonstrated the economy and efficiency of properly planned equipment and the experience of our engineers is available to those who have types of problems in the solution of which our equipment can be effectively used.

RESEARCH AIR CONDITIONING SYSTEM

Patented and Patents Pending



Seaman's Church Institute Installation

The Research Air Conditioning System cools and dehumidifies air without the use of refrigeration.

The conditioning unit, called the Calorider, cools and dehumidifies the air, the latent heat being carried off as sensible heat together with a portion of the original sensible heat of the air, by cooling water.

In a concentrator unit the hygroscopic brine is continuously reconcentrated at the same rate that it is diluted in the Calorider, under fully automatic control.

By a completely automatic reversal of the cycle, the identical equipment gives heating and controlled humidification in the winter.

Advantages of Research Air Conditioning

1. Usually costs no more to install, and cuts operating costs 50% to 80%.
2. Cooling water at 70° can give conditioned air with a dewpoint as low as 40°.
3. Maintenance is simple, cheap and infrequent. No reciprocating machinery—no gas to leak. The only moving parts are fans, pumps and their motors.
4. Minimum noise and vibration—limited to that of the main air supply blower.
5. Fully automatic control, all year around if desired; relative humidity may be held ± 3% at any point between 25% and 50%.
6. Equipment available in sizes 1000, 3000, 6000, 9000, and 12000 c.f.m.
7. No licensed operating engineering nor skilled operating mechanic is required.

THIS SYSTEM HAS TWO DISTINCT FUNCTIONS

(1) The control of temperature, humidity and air purity for human comfort and health at a low operating cost.

(2) The control of humidity and air purity for industrial applications, including the drying and purificaton of various gases.

COEY MULTISTAGE COOLING TOWERS

Patented and Patents Pending

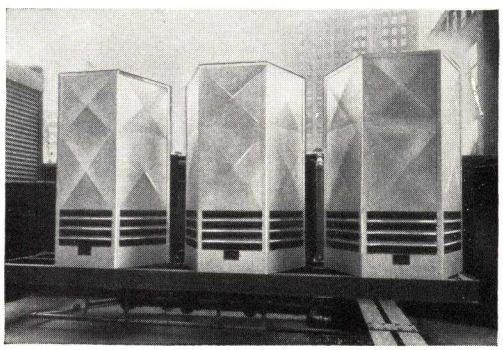
Gives Controlled Cooling, Minimum Noise Level, Sprayless Operation, Architectural Harmony

Because of its compactness, light weight, spray free and quiet operation, the Coey Multistage Cooling Tower is especially well-suited to roof and basement installations in congested areas; moreover, the highly efficient cooling provided by the multistage principle makes this unit desirable for installation anywhere.

The Coey Multistage Cooling Tower is constructed of a copper-bearing steel shell, nickel iron castings, Red Gulf cypress wood baffles, a non-overloading reverse blade centrifugal fan rotor, and the Coey Spray Eliminator of copper-bearing steel.

Air Movement—Non-overloading centrifugal rotor, high efficiency, and variable speed.

Principle of Operation—Three-pass, counter-current flow. No ice formation on fan rotor during Winter operations.



OTHER EQUIPMENT

Cottrell Electrical Precipitation Processes, Multiclone Dust Collectors, Impax Separators, Cottrell Royster Deodorizers, Royster Stove for High Temperature Heat Exchange.

REYNOLDS CORPORATION

Manufacturers of Air Conditioning Systems and Reynolds Prefabricated Streamlined Air Duct

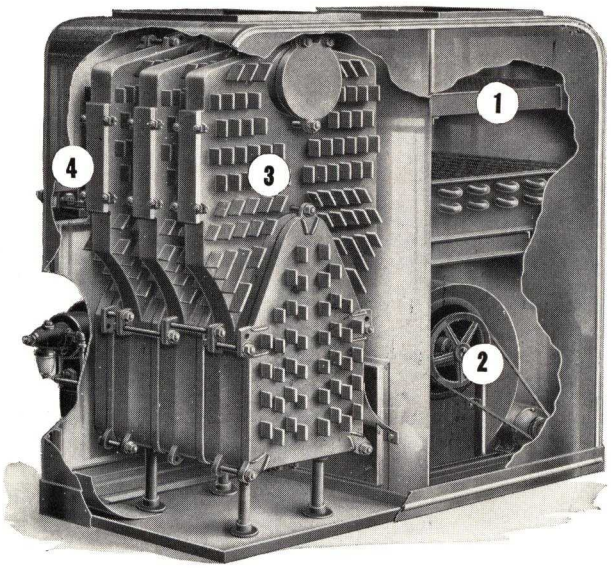
19 Rector Street
NEW YORK, N. Y.

REPRESENTATIVES AND DISTRIBUTORS IN PRINCIPAL CITIES

For Ecod Wire Lath for plaster base and Metallation for Insulating Buildings, see File Index

REYNOLDS CO-ORDINATED-BALANCED AIR CONDITIONING

For Oil and Gas Fuel



Sectional View of Air Conditioner
(1) Air Filter
(2) Air Circulator
(3) Heat Exchanger
(4) Humidifier

Factory Engineered and Fabricated from Burner to Grilles.

Heating
Humidifying — Cleaning
Summer Cooling Effect — Circulating

Optional Summer Cooling and Dehumidifying by Refrigeration.

A Reynolds Air Conditioning System is tailored at the factory to fit the home. Every component part is factory fabricated, factory engineered and factory-co-ordinated into the plan of installation best suited to your requirements.

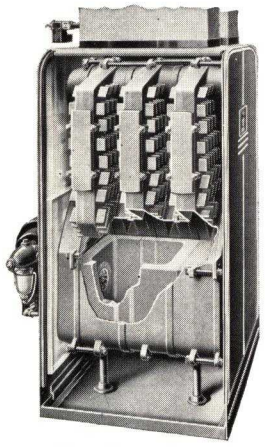
One manufacturer makes the complete equipment—the efficient oil or gas burner; the trim streamlined air conditioner unit and the standardized system of balanced air duct.

TECHNICAL DATA OF OIL AND GAS UNITS

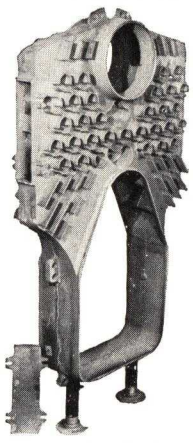
	No. 1-B Unit	No. 2 Unit	No. 3 Unit	No. 4 Unit
C.f.m. at 70° F.....	1100	1600	2300	2800
Max. B.t.u. output at plenum chamber.....	100,000	130,000	190,000	250,000
Max. oil input in lbs. per hr. at 19,000 B.t.u. per lb.	7.8	9.15	13.40	17.60
Gas input in B.t.u. per hr.	133,000	174,000	254,000	334,000
Motor size in horsepower.	⅙	⅓	⅓	½

All capacities are based on 62° entering air; 88° temperature rise; 150° final temperature.

REYNOLDS HEAT EXCHANGER



Heat Exchanger in Combination



Heat Exchanger Unit

A New Efficient Type of Cast Iron Furnace for Oil and Gas Fuel

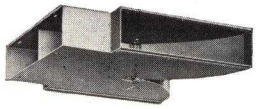
Sectional design provides an unusual multiplicity of heating surface for the circulating air. The staggered rows of fins projecting from the flat exchanger surfaces add still further to the heat transfer surfaces without enlarging the size of the exchanger itself—their staggered design thoroughly diffuses the air travel about the heat exchangers. The Reynolds sealing ring and tie rod design tightly seals in all combustion gases.

Capacities: See Table for Air Conditioner.

REYNOLDS STREAMLINE AIR DUCTS

Branch Outlet Series 800

Transition Elbow No. 251



End Splitter No. 830

Modern Air Stream Designed Ducts for Air Conditioning

Reynolds Streamline System of standardized air ducts enables you to engineer and *control* design of entire air conditioning installation. Your own organization can completely engineer the air duct distribution system, resulting in a balanced system that scientifically provides for correct proportionate distribution of air—winter and summer. Distributor, jobber or heating contractor installs the system subject to specifications.

Reynolds Corporation maintains a competent engineering service.

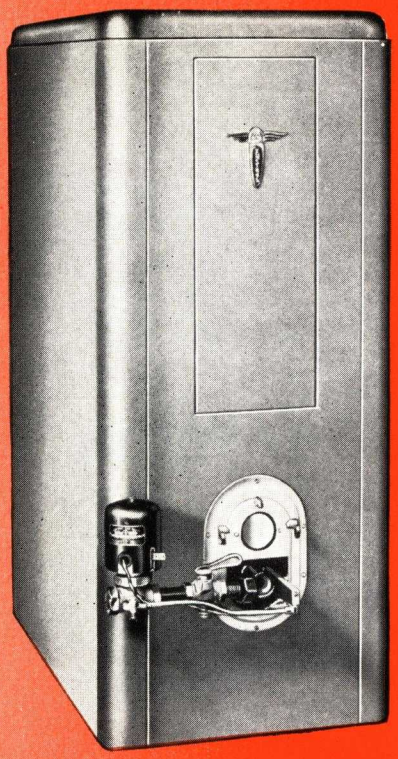
Reynolds Duct sold nationally through the usual trade channels.

JANITROL

GAS-FIRED

WINTER AIR CONDITIONERS • GRAVITY HEATERS • UNIT HEATERS

SURFACE COMBUSTION CORPORATION • TOLEDO, OHIO



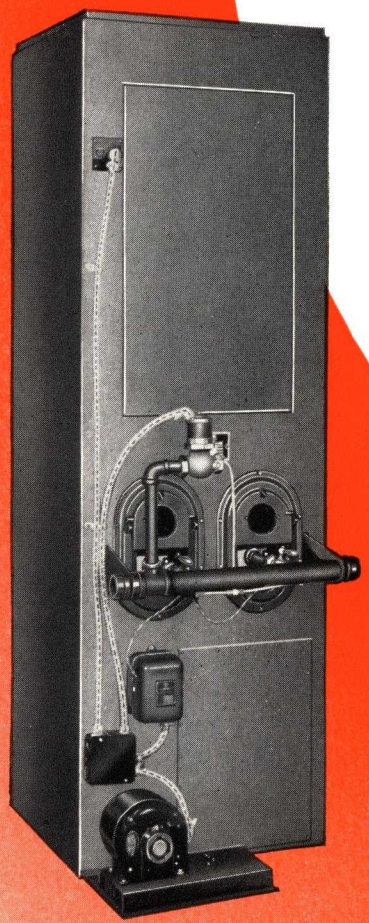
Series GC
Gravity Heaters

THE WORLD'S LARG
OF INDUSTRIAL HEAT
PROD
JANI
THE UNIVERSALLY ACCEPTED
CONDITIONING EQUIPMENT..
EXPERIENCE IN MANUFACTURING

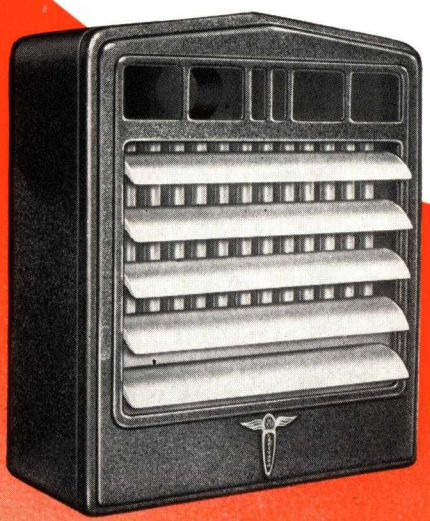
Pioneer in the use of *gas* as a fuel, the Surface Combustion Corporation has devoted thirty years exclusively to the development and production of gas-fired equipment for industrial heat treat processes and for space heating purposes, domestic, commercial and industrial.

Through its wide spread experience in the application of gas for fuel purposes and with extensive research facilities, Surface Combustion developed the first *conversion burner* for the burning of gas in household furnaces and boilers. In the past ten years thousands of these units have been installed by gas companies everywhere. The widely known *Columbus* and *Heatmaster* warm air house heating equipment, manufactured by Surface Combustion, was one of the first complete lines designed and built to burn gas.

By continual development and improvement, resulting from extensive experience and constant investigation, the makers of *Janitrol*



Series BC
Conditioners



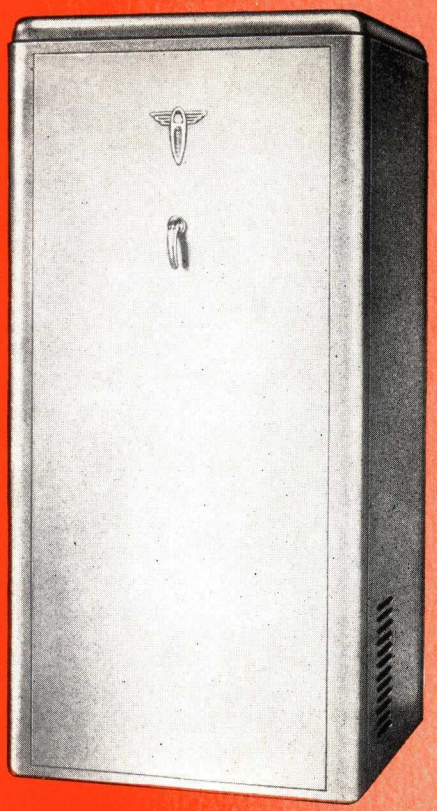
Series U and C
Unit Heaters

EST MANUFACTURER
TREATING EQUIPMENT

UCES

TROL

GAS-FIRED HEATING AND AIR-
..BACKED BY THIRTY YEARS
GAS-FIRED PRODUCTS EXCLUSIVELY



Series CA
Conditioners

have produced equipment that fulfills all the requirements for perfect winter air conditioning — together with the largest and most advanced line of gas heating equipment on the market.

Trained sales engineers, located in many branch offices throughout the country, work with architects, heating engineers, gas companies and dealers everywhere. This makes possible direct contact with individual heating and air conditioning problems and permits close cooperation between all concerned from layout to completed installation.

The large contribution made by the Surface Combustion Corporation to the advancement and acceptance of gas heat, for domestic, commercial and industrial purposes, has earned for this company the endorsement of both the gas industry and the heating industry. Backed by this endorsement and the reputation of its manufacturer, *Janitrol* equipment can be specified with full assurance of complete satisfaction.

Series CF Conditioners
Types B, C and D

Series CF Conditioners
Type A

JANITROL "CF" GAS-FIRED

26
24

BEAUTIFUL APPEARANCE AND COMPACT DESIGN

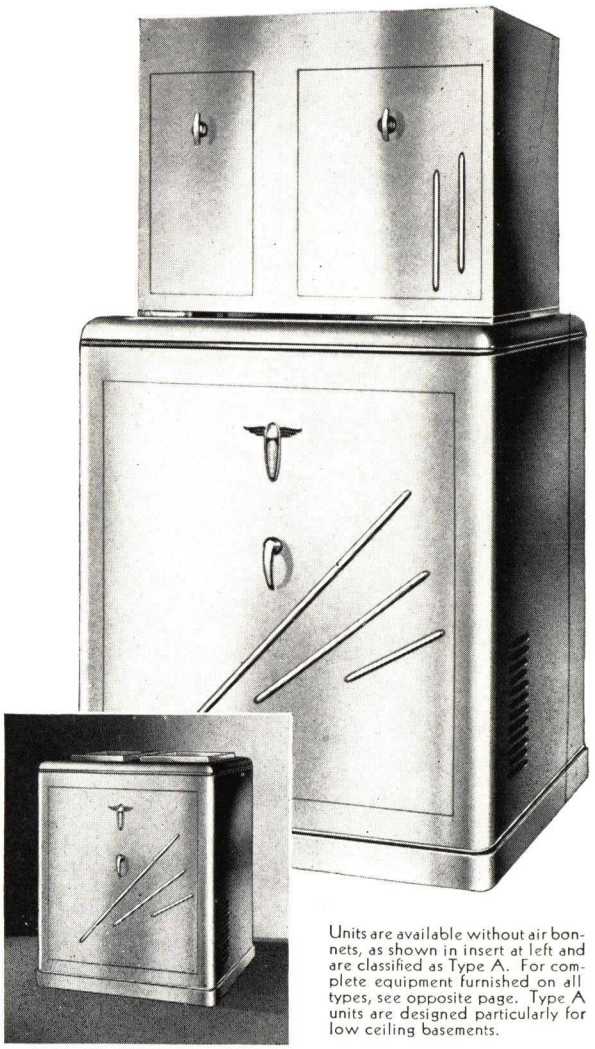
The unmatched beauty of the Janitrol CF Conditioner is due to its rich opalescent blue finish, its sparkling chromium trim, the artistry of its accouterments. Small and compact, it blends into its surroundings so that the basement may truly be the recreational headquarters of the home. The casing completely conceals all gas, water and electric supply lines and is constructed in such a manner that no screws, bolts or nuts mar its surface. A most remarkable fact is that the entire line of Janitrol Conditioners are identical in front view dimensions and appearance—really an achievement in engineering and artistic design.

A COMPLETE LINE FOR EVERY REQUIREMENT

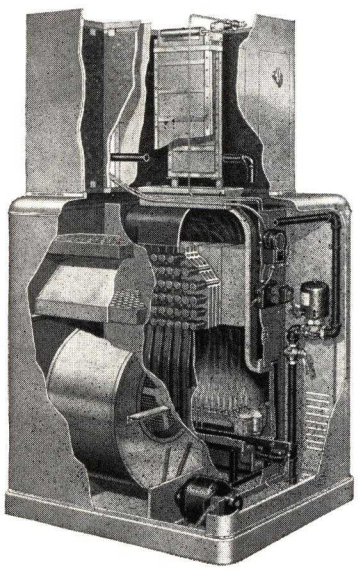
There is a proper type and size Janitrol CF Conditioner to fill every home heating need. This line is complete, being furnished in five sizes—90,000, 120,000, 150,000, 180,000 and 240,000 hourly Btu input capacity. When a home is of size which requires a greater input capacity than that furnished by the largest unit, experience with many installations has shown that to obtain the most satisfactory results, two separate units, individually controlled, should be installed.

SIMPLE TO INSTALL

One of the outstanding features of Janitrol Conditioners is the extreme ease with which they are installed. There are no complicated details—everything has been designed for simplicity and rapidity of installation. The Janitrol CF Conditioner offers the following list of exclusive installation features—leveling studs fitted in the base for easy leveling—a self-sealing felt ring on the base which eliminates the necessity of cementing the unit to the floor—simplified blower mounting studs attached to the base—simplified motor mounting easily adjustable by the manipulation of one wing nut. Furthermore, the units have been designed for use with small size, standardized ducts—a distinct advantage in speeding up installation and reducing cost.



Units are available without air bonnets, as shown in insert at left and are classified as Type A. For complete equipment furnished on all types, see opposite page. Type A units are designed particularly for low ceiling basements.



OUTSTANDING "CF" FEATURES

Cutaway view at left illustrates compact, yet readily accessible, arrangement of unit.

HEATER . . . Cast iron with multiplicity of embedded copper rods for conduction of heat to exterior of heater. Exposed end of each rod is equipped with a helical copper fin thus exposing a large effective heating surface to the air to be heated.

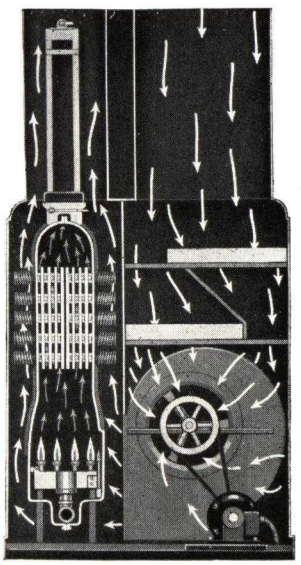
BURNER . . . Janitrol multi-inspirator type consisting of a series of individual burners with multi-port heads of high-temperature refractory material. Each head burns with short, sharp flame.

BLOWER . . . Multi-blade centrifugal type with felt vibration insulation between blower outlet and casing partition. Rubber mounted to base of unit to prevent vibration.

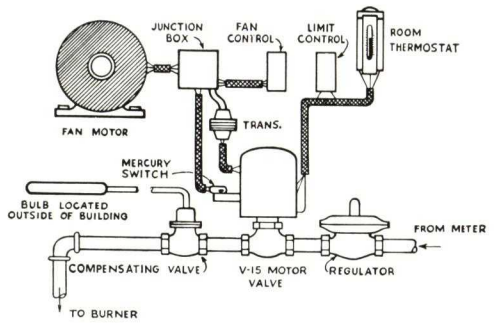
MOTOR . . . Mounted on aligned base with single thumb screw adjustment for proper belt tension.

HUMIDIFIER . . . Exclusive refractory plate type mounted in cast iron overflow pan atop heater unit. Water, discharged through self-cleaning nozzle into chamber, at top of humidifier assembly, trickles uniformly over plates of porous, absorbent, refractory material. The plates afford large evaporating surface to heated air passing over them. Solenoid water valve opens when blower is in operation, closes when blower stops.

FILTERS . . . Replaceable type composed of strands of spun glass coated with special adhesive.



WINTER AIR CONDITIONER



COMPENSATING CONTROL SYSTEM

JANITROL CONTROL SYSTEMS

(1) JANITROL COMPENSATING CONTROL SYSTEM (Furnished with Type D)— This system is designed to regulate the heat supplied to the house directly in proportion to the heat losses of the house by controlling both the amount of gas burned and the volume of air delivered. Thus, heat is supplied only *at the required rate* resulting in constant, uniform temperature and much longer periods of blower operation.

When heat is required, thermostat opens V-15 motor valve admitting gas to burner. The amount of gas admitted to burner is regulated by the compensating valve. This valve is actuated by the *outside* temperature by means of a temperature bulb mounted outside the house. When V-15 gas valve opens, a mercury switch, on valve arm, starts the two-speed blower motor at low speed, (1140 r.p.m.). At low speed, blower delivers approximately 50% of maximum volume. Blower continues to operate at low speed as long as air temperature in unit is below 175° F. If outside temperature is mild, gas input to burner will be low and heating cycle may be completed with fan operating at low speed.

When outside temperature is low and gas input is higher, air temperature in unit eventually will reach 175° F. At this temperature, blower motor automatically switches to high speed, (1725 r.p.m.), increasing air delivery to maximum. This continues until air temperature in unit drops to 125° F., when blower motor switches back to low speed. When weather is extremely cold, blower may operate at high speed until heating cycle is completed. When room temperature reaches thermostat setting, thermostat closes V-15 gas valve and blower motor stops.

(2) CUSTOMARY SYSTEM (Furnished with Types A, B and C)— Thermostat opens V-15 gas valve when heat is required. When air in unit reaches a predetermined temperature, an automatic switch starts single speed blower motor. When room temperature reaches thermostat setting, thermostat closes V-15 gas valve. Blower motor operates until air temperature in unit reaches predetermined minimum.

ENGINEERING DATA

Catalog No.	Btu Input per Hour	*Btu Output At Register	†Approx. C.F.M. Delivered At Register	GAS CAPACITY Cu. Ft. per Hour At Various Btu			BLOWER DATA			
				550	800	1000	Diam. of Wheel	Width of Wheel	No. of Wheels	R.P.M. At 3/16" Static
CF 90-37	90,000	64,800	900	164	113	90	14"	7"	1	580
CF120-37	120,000	86,400	1200	218	150	120	14"	10"	1	570
CF150-37	150,000	108,000	1500	273	188	150	14"	14"	1	570
CF180-37	180,000	129,600	1800	328	225	180	14"	7"	2	590
CF240-37	240,000	172,800	2400	436	300	240	14"	10"	2	610

*Allows for 10% heat loss from warm air ducts between bonnet and register. This is normal loss for average installations. Longer than average ducts, type of duct covering, duct exposure, whether or not basement is heated, etc., should be considered and Conditioner sized accordingly.

†It is assumed that approximately 75% of Btu input rating will be delivered and, consequently, C.F.M. shown will be approximately the volume of air passing through duct system and is volume on which the duct system should be designed. The approximate C.F.M. is based on air temperature between 140° and 150° F.

DIMENSIONS IN INCHES

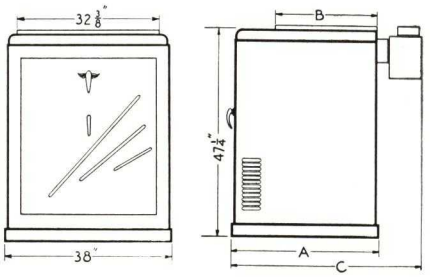
Catalog No.	DIMENSIONS				Flue Diam.	*Gas Conn.	H.P.	MOTOR DATA			
								Types A, B & C		Type D	
	A	B	C	D				Type Motor	R.P.M.	Type Motor	R.P.M.
CF 90-37	33½	23⅜	43¾	23½	5	¾	⅙	S.P.	1725	CAP.	1725-1140
CF120-37	38	27⅞	48¼	28	5	1	¼	S.P.	1725	CAP.	1725-1140
CF150-37	43¾	33⅝	55	33¾	6	1	⅓	CAP.	1725	CAP.	1725-1140
CF180-37	48¼	38⅛	59½	38¼	6	1¼	⅓	CAP.	1725	CAP.	1725-1140
CF240-37	57¾	47⅝	70	47¾	7	1¼	†½	CAP.	1725	CAP.	1725-1140

*Size of manifold connection—not size of gas supply line.

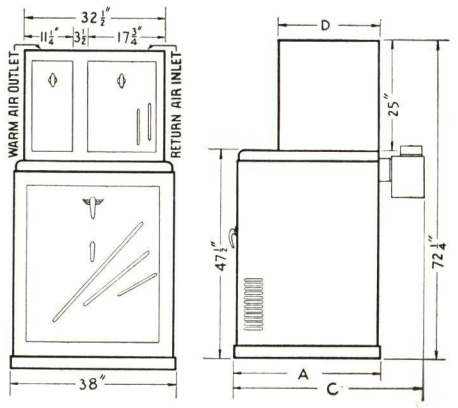
S.P.—Split phase type motor. CAP.—Capacitor type motor.

†All types CF240-37 Conditioners supplied with 220 V.-60 cyc.-1 phase-½ h.p. motor. The standard 3-wire service, normally available, affords 110-220 volt service. Control circuit operates on 110 volt-60 cycle current.

TYPE A



TYPES B, C & D



STANDARD EQUIPMENT

All "CF" Conditioners are available in four different types based on equipment furnished.

Type A—Includes insulated cabinet, without bonnet; one-piece cabinet base; cast iron heat exchanger with extended copper rod and fin heating surfaces; multi-inspirator burner; automatic pilot and fittings; draft diverter; V15A electric motor gas valve, transformer and wire; T11A Acratherm thermostat with 30 ft. of triplex wire; combination blower and temperature limit control, rubber insulated blower assembly, resilient base motor with adjustable base and adjustable pulley; renewable filters; main line shut-off cock; adjustable gas pressure regulator; cast iron evaporating pan, copper float tank, pipe strap valve, 10 ft. copper tubing and fittings. A summer switch may be installed to control the blower for summer operation.

Type B—In addition to Type A equipment, the Type B includes bonnet with access doors; bonnet lined with sound-deadening material.

Type C—Includes all Types A and B equipment plus the Janitrol refractory plate type humidifier, low voltage solenoid water valve with transformer, pressure gauge, water pressure regulator, strap valve, 10 ft. copper tubing and fittings. Humidity control obtained by adding a humidistat.

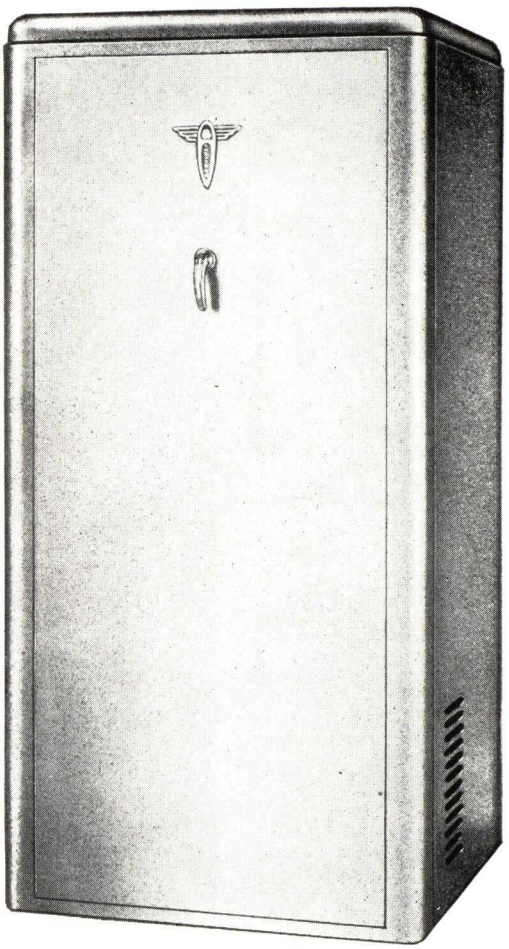
Type D—Includes all Type C equipment and the Janitrol Compensating Control System in place of the customary controls. The Janitrol Compensating Control System includes a two-speed motor (1140-1725 R.P.M.), a two-contact fan control, limit control, V15C motor valve, outside temperature bulb with 25 ft. of capillary tubing and bellows-operated compensating valve. Not available for 25 cycle.

JANITROL "CA" GAS-FIRED

A MODERN UNIT AT MODERATE PRICE

The Janitrol CA Conditioner is designed especially for installation in the medium class home where modern winter air conditioning is desired but economy is necessary. Made in a complete range of sizes from 60,000 Btu hourly input capacity to 240,000 Btu hourly input capacity, it incorporates much of the equipment furnished with the CF series. Fully automatic in operation, the CA Conditioner fulfills the requirements of true winter air conditioning by mechanically circulating filtered, warmed, humidified air in every room.

Here, we believe, is the greatest medium-priced value we have ever been able to offer—a unit so obviously better that it will satisfy those who want all of the features of winter air conditioning but who do not want to invest in de luxe equipment.

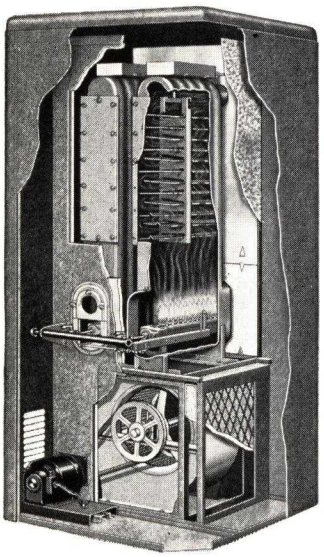


"CA" CONSTRUCTION FEATURES

CASING . . . high grade furniture steel finished in rich tapestry blue crinkle. No bolts, nuts or screws mar the appearance of the unit as all joints are of the slip seal type and are air tight. All control equipment, piping and electric connections are concealed inside the casing yet are easily available through large access doors.

BASE . . . heavy gauge steel plate with angle edge forming connections for casing sides and interior partitions.

HEATER . . . twin heaters are rigidly mounted directly above the blower to afford extreme compactness and provide large heating capacity in minimum space. Heaters are constructed of heavy steel plate, corrugated *vertically*. In addition to providing ample heating surface, these corrugations serve to make the heaters strong and rigid. Being vertical, the corrugations are streamlined with the upward flow of the air providing full contact with the air over the entire area of the heaters. This assures maximum heat transfer and high efficiency in operation.



BURNER . . . exclusive multi-inspirator type consisting of a multiplicity of individual primary air mixers each producing a short, sharp flame. Individual multi-port burner heads make possible this type flame without flashback even when the gas input is reduced. Burner design is such that the gas pipes in which the orifices are drilled do not contact the individual burner tubes; consequently, the tubes remain relatively cool and retain full capacity after hours of continuous operation. Burners ignite quietly, operate quietly and shut off quietly.

FILTER . . . replaceable, spun glass type with adhesive coating, removes dust, dirt and pollen before air enters blower.

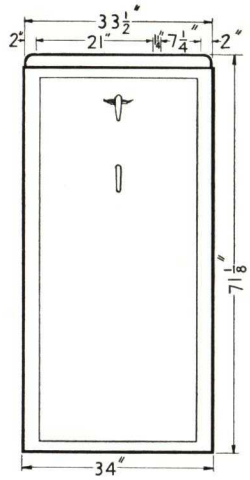
BLOWER . . . centrifugal, multi-blade type mounted to the casing base with rubber grommets. This method of mounting, together with felt insulation around the discharge opening, eliminates vibration and assures extremely quiet blower operation.

HUMIDIFIER . . . pan type with large pan-humidifier mounted on top of each heater. The water is heated and its evaporation thereby accelerated. V-shaped interior of pan permits regulation of water level and thus provides a means to control humidity. A copper water supply tank is mounted on the rear of the casing. In this tank a ball-float opens and closes a water valve to maintain the water in the pans at the desired level.

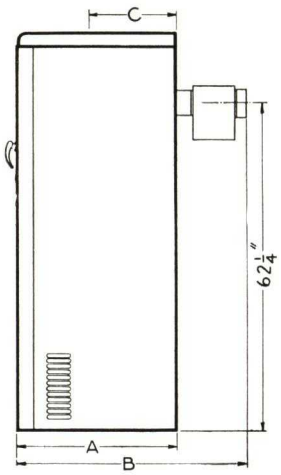
SERIES "BC" CONDITIONERS

Designed for low cost homes, available in two models: No. BC45-37 with 45,000 Btu hourly input and No. BC90-37 with 90,000 Btu hourly input. Automatic in operation. Illustrated on page 2. Full particulars furnished on request.

WINTER AIR CONDITIONER



Front View



Side View

ENGINEERING DATA

Model No.	Btu Input per Hour	*Btu Output At Register	†Approx. C.F.M. Delivered At Register	Gas Capacity Cu. Ft. per Hour At Various Btu			BLOWER DATA			
				550	800	1000	Dia. of Wheel	Width of Wheel	No. of Wheels	R.P.M. At ⅛" Static
CA 60-37	60,000	43,200	600	109	75	60	14"	7"	1	525
CA 90-37	90,000	64,800	900	164	113	90	14"	7"	1	550
CA120-37	120,000	86,400	1200	218	150	120	14"	10"	1	550
CA150-37	150,000	108,000	1500	273	188	150	14"	14"	1	550
CA180-37	180,000	129,600	1800	328	225	180	14"	7"	2	550
CA240-37	240,000	172,800	2400	436	300	240	14"	10"	2	550

Note: Symbols refer to explanatory notes under first table on page 5.

STANDARD EQUIPMENT

CA Conditioners are available with three different types of controls. WITH STANDARD CONTROLS—Includes insulated cabinet; cabinet base with integral motor mounting; two heavy steel plate corrugated heat exchangers; multi-inspirator burners; main line shut-off cock; adjustable gas pressure regulator; automatic pilots with fittings; draft diverter; electric solenoid gas valve, relay, BX conduit and fittings; T11A Acratherm thermostat with 30 ft. of triplex wire; limit control; rubber mounted blower assembly, resilient base motor; replaceable filters; evaporating pans, copper float tank, pipe strap valve, and 10 ft. copper tubing and fittings. A fan control (No. 6031) may be installed but is not supplied as standard equipment.

WITH TYPE V-5 CONTROLS—Equipped the same as conditioners with standard controls except that a V15A motor gas valve and an L101A combination limit and fan control (SC part No. 6325) are substituted for the standard solenoid gas valve, relay and limit control.

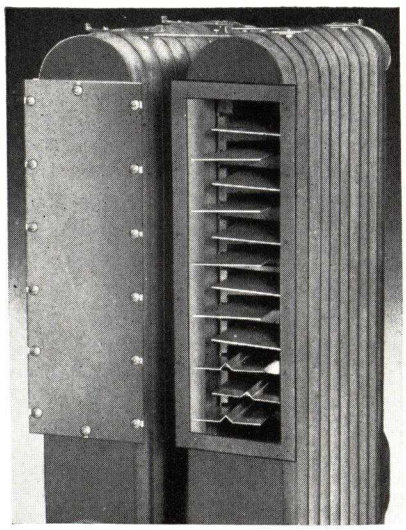
WITH TYPE V-7 CONTROLS—Equipped the same as conditioners with standard controls except that a V15C motor gas valve and an L101A combination limit and fan control (SC Part No. 6325) are substituted for the standard solenoid gas valve, relay and limit control.

A summer blower switch may be installed to control the blower for summer operation on all three types.

DIMENSIONS IN INCHES

Catalog No.	DIMENSIONS		PLENUM CHAMBER				Flue Dia.	*Gas Conn.	MOTOR DATA		
	A	B	Warm Air		Return Air				H.P.	Type	R.P.M.
			Width	Depth-C	Width	Depth-C					
CA 60-37	28⅝	40⅝	21	15½	7¼	15½	4	¾	⅙	S.P.	1725
CA 90-37	33⅝	47	21	20½	7¼	20½	5	¾	⅙	S.P.	1725
CA120-37	39⅛	52½	21	26	7¼	26	5	¾	¼	S.P.	1725
CA150-37	43⅞	58⅝	21	30¾	7¼	30¾	6	1	¼	S.P.	1725
CA180-37	51⅞	66⅝	21	38¼	7¼	38¾	6	1¼	⅓	CAP.	1725
CA240-37	62¾	78⅞	21	49⅜	7¼	49⅜	7	1¼	⅓	CAP.	1725

*This is the size of the manifold connection—not the size of the gas supply line.
S.P.—Split phase type motor. CAP.—Capacitor type motor.



Twin Type Heater "CA" Conditioner

HOW AIR IS CONDITIONED

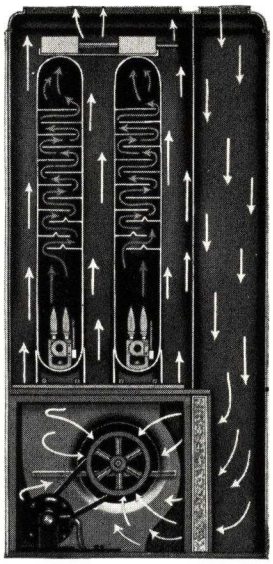
Air from the return ducts is introduced into the unit either at top, or through side or bottom. First it passes through the filter where it is cleaned; thence through the blower which discharges it upward over the vertically corrugated heaters where it is quickly warmed. Humidifiers are located on top the heaters so that all air must flow over them. The conditioned air is then conveyed through the warm air ducts into the rooms.

HOW HEAT IS TRANSFERRED

The hot gases of combustion, rising through the interior of the heater, are directed by the interior baffles. These baffles are staggered to force the gases through a long and extended passage —both vertical and horizontal —during which the heat is surrendered to the heater surfaces from whence it is picked up by the air stream.

CONTROLLED OPERATION

With standard controls, when the thermostat calls for heat the relay is closed and the solenoid valve opens the main gas supply to the burner. At the same time, the blower is started and circulation of the heated air begins. When the thermostat is satisfied, both the gas supply and blower stop automatically. A heat actuated blower control switch is furnished with V-5 and V-7 controls for delayed starting of blower.

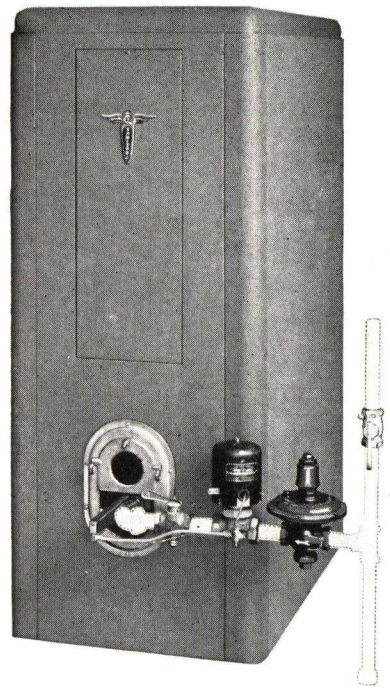


JANITROL

"GC" GAS-FIRED GRAVITY HEATERS

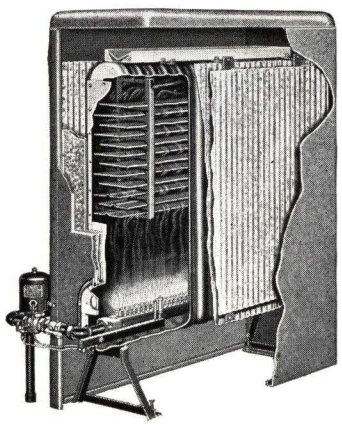
For the Modest New Home and for Improved Heating in the Old

Here is a new gravity type heater with the beauty of modern design combined with the dependability of higher priced Janitrol equipment. Design and construction features never before marketed in a gravity heater are characteristic of the Janitrol GC. Every new home of modest cost, every warm air remodeling job where blower circulation cannot be considered, is a logical place to install this Janitrol Gravity Heater.



Simple, Effective Design and Operation

Return ducts, connected to lower part of casing sides, deliver return air. The air flows straight upward over both sides of the streamlined, corrugated, heavy steel heat exchanger. Double, corrugated metal inner liners, attached to the heat exchanger, provide secondary heating surfaces for the air and reduce direct radiation losses from the Heater. The heated air picks up moisture from the pan-type humidifier atop the heat exchanger. Warm air leader connections are made in the top of the unit. Janitrol Gravity Heaters are equipped with the same efficient, quiet operating multi-inspirator burner furnished with CF and CA Conditioners. Models GC75-37, GC90-37 and GC120-37 are furnished with one heat exchanger. Models GC150-37 and GC180-37 have twin heat exchangers housed in one casing. Both types are shown on dimension drawings.



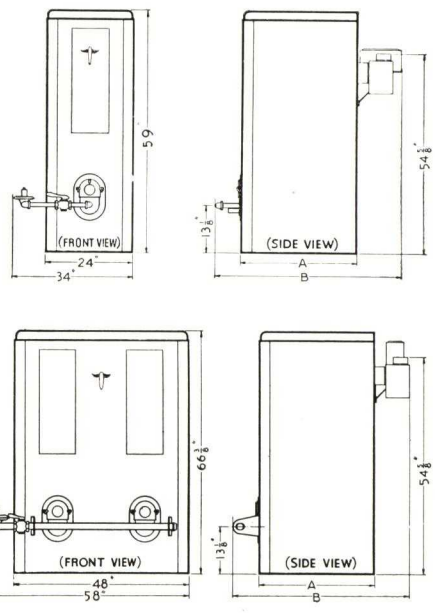
STANDARD EQUIPMENT

Includes cabinet finished in tapestry blue baked enamel; heavy steel plate corrugated heat exchanger with double, corrugated innerliners; multi-inspirator burner; main line shut-off cock; adjustable gas pressure regulator; automatic pilot with fittings; draft diverter; V15A motor gas valve with transformer and 25 ft. transformer wire; T11A Acratherm thermostat with 30 ft. triplex wire; evaporating pan, copper float tank, pipe strap valve and 10 ft. copper tubing with fittings.

Model 2GC120-37 consists of two individual GC120-37 units supplied with only one electric motor gas valve, one pressure regulator and one water pipe strap valve.

ENGINEERING DATA AND DIMENSIONS IN INCHES

Catalog No.	Rating Btu per Hour		Sq. In. Pipe Area		GAS CAPACITY Cu. Ft. per Hour			DIMENSIONS			
	Input	*Available At Register	†First Floor Rooms	‡Second Floor Rooms	550 btu	800 Btu	1000 Btu	A	B	Flue Diam.	§Gas Conn.
GC 75-37	75,000	51,000	390	300	136	94	75	31¾	50¼	4	¾
GC 90-37	90,000	61,200	470	360	164	113	90	39¾	58¼	5	¾
GC120-37	120,000	81,500	625	480	218	150	120	50⅜	68⅞	6	¾
GC150-37	150,000	102,000	780	600	272	188	150	31¾	49	2-4	1
GC180-37	180,000	122,400	940	720	328	226	180	39¾	57	2-5	1
2GC120-37	240,000	163,000	1250	960	436	300	240	50⅜	68⅞	2-6	1¼



*Hourly Btu Available at Register allows for 15% heat loss from warm air ducts between bonnet and register. This is normal loss for average gravity installation. Longer than average ducts, type of duct covering, duct exposure, whether the basement is heated, etc., should be considered and heater sized accordingly.

†Leader pipe areas shown in this column are based on delivering 130 Btu per sq. in. of pipe area.

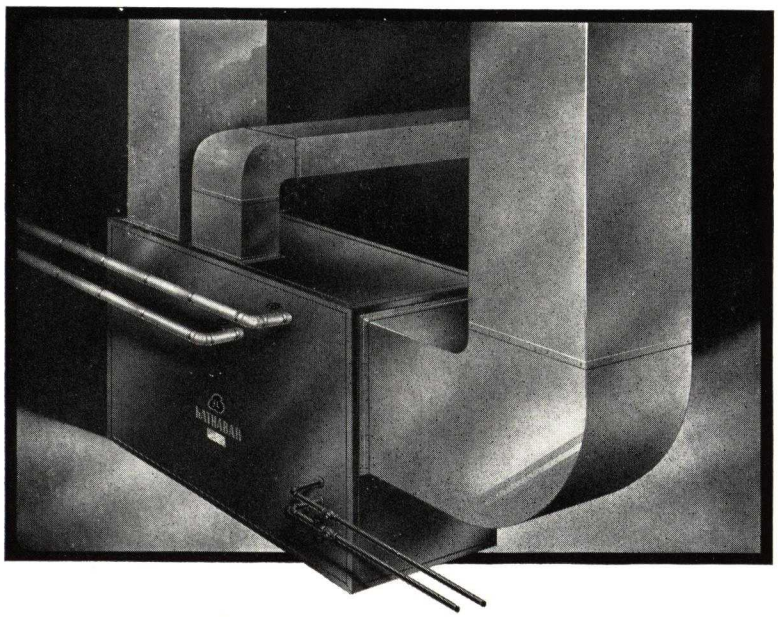
‡Leader pipe areas shown in this column are based on delivering 170 Btu per sq. in. of pipe area.

To select proper size unit for a two-story house: divide second floor warm air pipe area required by .75 and add to first floor warm air pipe area required. Select Gravity Heater on basis of area from column "First Floor Rooms."

§This is the size of the manifold connection—not the size of the gas supply line.

KATHABAR

AIR CONDITIONING EQUIPMENT



Standard Kathabar Unit Installation

KATHABAR UNITS SUPPLY COMPLETE YEAR-'ROUND AIR CONDITIONING FOR COMFORT AND FOR INDUSTRIAL PROCESSES... AVAILABLE IN STANDARD PACKAGE UNITS READY FOR IMMEDIATE OPERATION

SIMPLIFIED HUMIDITY REGULATION

Kathabar Air Conditioning equipment employs, as the dehumidifying agent, a lithium chloride solution called *Kathene*. The principle utilized is the difference in the vapor pressure between the air to be conditioned and the Kathene over which the air is passed. When the vapor pressure of the Kathene is lower than that of the air the Kathene absorbs moisture and the action is one of dehumidification. When the vapor pressure of the Kathene is higher than the air, the air absorbs moisture from the Kathene, thus humidifying the air. The vapor pressure of the Kathene is controlled by regulation of its temperature.

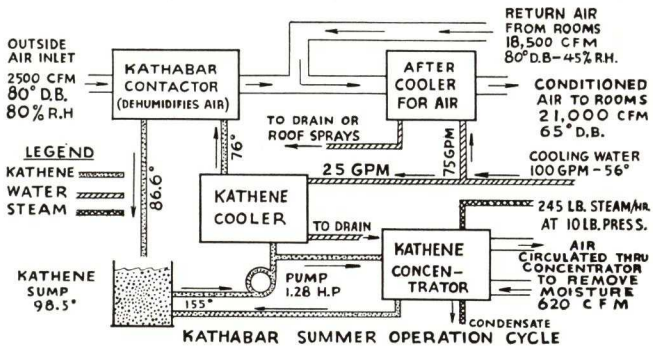
During the past two years Kathabar dehumidification equipment has been incorporated in many commercial and industrial air conditioning installations. Of particular advantage with the Kathabar system is the wide range of dehumidification which can be obtained under extremely accurate control. Of further significance is Kathene's permanency, requiring no replenishment nor replacement.

Now, the manufacturer of Kathabar offers a series of standard units for complete, year 'round air conditioning. Under fully automatic control, these units circulate, clean, wash and deodorize the air. During summer they dehumidify and cool the air and in winter they humidify and heat. One of the outstanding features of Kathabar air conditioning is the deodorizing and germicidal properties of Kathene.

In addition to these standard units, Kathabar equipment is available for any special application either for comfort purposes or for industrial processing. Complete information can be obtained by writing Kathabar Division, Surface Combustion Corporation, Toledo, Ohio.

OPERATION

Below is a diagram of Kathabar's typical dehumidification and cooling cycle. 2500 CFM of outside air enter the unit at 80° F. (dry bulb) and at 80% relative humidity. The *contactor*, extracts 53% of the moisture reducing the relative humidity to 31%. The dehumidified air is then mixed with 18,500 CFM of return air from the rooms. The entire 21,000 CFM are then passed through the water-cooled *after-cooler* and emerge for distribution to rooms at 65° F. This permits maintaining rooms at 80° F. and 45% relative humidity. Dehumidification and cooling are accomplished with 100 gallons per minute of 56° F. water and 245 lbs. of steam per hour, indicative of Kathabar's economical operation.



KATHABAR SUMMER OPERATION CYCLE

STANDARD KATHABAR UNITS

Unit No.	Capacity C.F.M.	Overall Dimensions (ducts not included)		
		Width	Depth	Height
6	200- 800	29½"	100"	58½"
12	800-1500	29½"	113"	58½"
25	1500-3000	42"	128"	58½"
*50	3000-6000	43"	91"	67"

*Shipped in two sections for convenient handling.

JANITROL 26 24 GAS-

FOR COMMERCIAL AND INDUSTRIAL HEATING

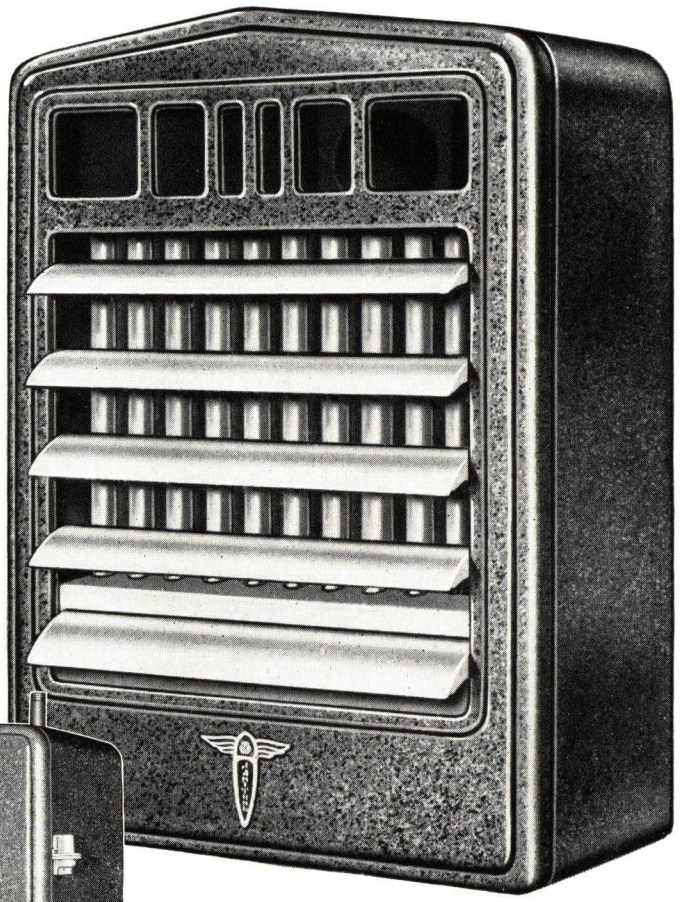
The Janitrol Gas-Fired Unit Heater is an independent, self-contained, automatic unit which generates heat by the burning of gas. No central heating plant or boiler is needed, no water is used, no firing attention is necessary and no fuel storage space is required.

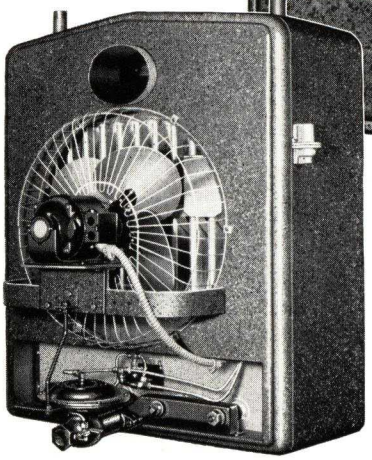
The heaters are suspended from overhead with underside of heater about 8 feet from the floor. In this location, no obstruction is offered to the passage of people and no valuable floor space is occupied.

From its overhead location, the heater, by fan circulation of warm air, distributes heat where it is needed, and provides constant, uniform temperature. Circulation of the air also overcomes stratification and with it, high uneconomical ceiling temperatures.

Rapid response quickly brings up temperature when sudden blasts of cold air from opened doors chill the interior. Reduced temperatures, overnight and week-ends, afford economy of operation yet the automatic, thermostatic control of the heaters safeguards against freeze-ups.

For complete heating; for supplementary heating when existing heating capacity is insufficient; for replacement of worn out heating systems; for building expansion; for specific zone or spot heating; for periodic heating; for these and any commercial or industrial heating requirements, Janitrol Gas-Fired Unit Heaters provide a simple, effective method to obtain completely satisfactory results.

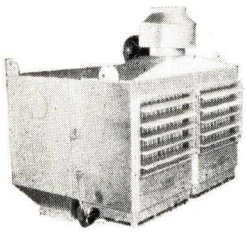




SERIES U AND SERIES C

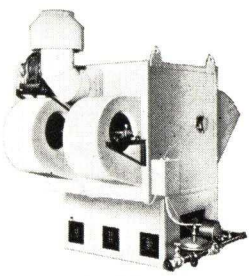
Series U and Series C each comprise seven models ranging identically in input from 45,000 to 200,000 Btu hourly input. Units of the same capacity in both series are exactly the same throughout with the exception of the metal used in the combustion chamber, heat exchangers or radiators and collecting chamber. In Series U heaters, the metal is chrome alloy steel; in Series C, ingot iron is used. Series U and Series C heaters are approved by the American Gas Association and listed by Underwriters' Laboratories as standard for general use. For installations in garages, airplane hangars, etc., specify Series UG or Series CG. Example: UG85-37 or CG-85-37.

LARGE CAPACITY, HEAVY DUTY UNITS



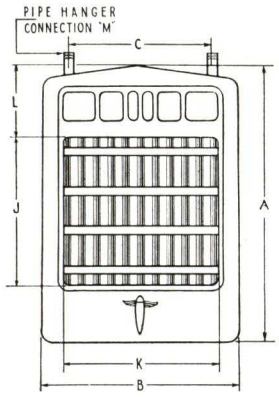
400-36 Twin Type

The 400-36 TWIN TYPE (left) and the S4000 (right) are both designed for large volume heating such as exposition halls, warehouses, factory buildings, etc. Both units are rated at 400,000 Btu input per hour. Capacities and other data are given in table at top of next page. Both units are equipped with squirrel cage type fan which permits the use of duct work for heat distribution. The 400-36 type is furnished with four suspension lugs. The S-4000 may be suspended or set on platform or floor. Both units finished in heat resisting aluminum paint. Complete details furnished on application.

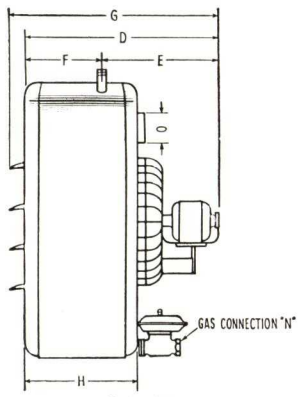


S4000

FIRED UNIT HEATERS



Front View



Side View

DIMENSIONS—INCHES

Catalog No. Series U	Catalog No. Series C	A	B	C	D	E	F	G	H	J	K	L	M	N	*O
U 45-37	C 45-37	29	18 5/8	11 1/2	23 5/8	12 7/8	10 3/4	25 3/8	15 1/4	14	13	7 1/2	1	3/4	4
U 60-37	C 60-37	29	22 5/8	15 1/2	23 5/8	12 7/8	10 3/4	25 3/8	15 1/4	14	17	7 3/4	1	3/4	4
U 85-37	C 85-37	36 1/2	22 5/8	15 1/2	25 1/4	14 3/4	10 1/2	27	15 1/4	20	17	9 1/4	1	1	5
U100-37	C100-37	36 3/4	26 5/8	19 1/2	25 1/4	14 3/4	10 1/2	27	15 1/4	20	21	9 1/2	1	1	5
U125-37	C125-37	37	30 5/8	23 1/2	26	16	10	27 3/4	15 1/4	20	25	9 3/4	1	1	6
U160-37	C160-37	36 3/4	26 5/8	19 1/2	35 1/4	20 1/4	14 7/8	37	23 3/4	20	21	9 1/2	1 1/4	1 1/4	7
U200-37	C200-37	37	30 5/8	23 1/2	35 1/4	20 1/4	14 7/8	37	23 3/4	20	25	9 3/4	1 1/4	1 1/4	7

*Flue opening is oval shaped. This is size of round flue pipe which can be formed to fit over flue opening collar.

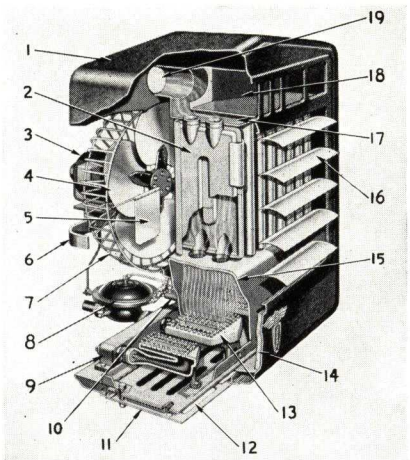
CAPACITIES OF STANDARD SERIES U AND SERIES C

Catalog No. Series U	Catalog No. Series C	INPUT Btu per Hr.	INPUT Cu. Ft. Gas per Hour 550 Btu	INPUT Cu. Ft. Gas per Hour 1000 Btu	OUTPUT Unit Vented *Btu per Hr.	OUTPUT Unit Vented *Sq. Ft. Steam Rad. Equivalent	OUTPUT Unvented Btu per Hr.	Air Deliv. C.F.M.	Air Vel. At Heater Outlet ft./min.	Motor Size H.P.	Fan Speed R.P.M.
U 45-37	C 45-37	45,000	82	45	37,350	156	40,500	615	512	1/40	1080
U 60-37	C 60-37	60,000	109	60	49,800	207	54,000	775	492	1/40	1080
U 85-37	C 85-37	85,000	155	85	70,550	294	76,500	1535	689	1/15	1140
U100-37	C100-37	100,000	182	100	83,000	345	90,000	1600	590	1/15	1140
U125-37	C115-37	125,000	227	125	103,750	432	112,500	1695	513	1/15	1140
U160-37	C160-37	160,000	291	160	132,800	553	144,000	2090	758	1/10	860
U200-37	C200-37	200,000	364	200	166,000	690	180,000	2210	675	1/10	860
400-36 Twin Type		400,000	728	400	332,000	1380	360,000	5000	820	1	770
S4000		400,000	728	400	332,000	1380	360,000	5000	800	1	780

*Output based on effective heating of vented unit and when unit is located in room being heated.

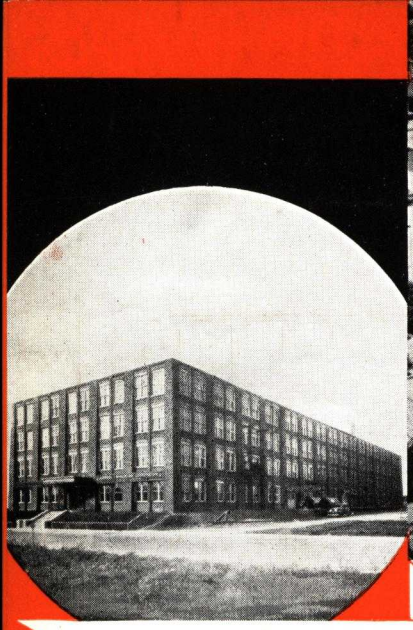
CONSTRUCTION FEATURES — SERIES U AND C

1. Casing of heavy gauge sheet steel stampings finished in blue crinkle baked enamel.
2. Seam welded heat exchanger tubes or radiators. Center baffle divides hot rising gases into two streams resulting in better heat transfer.
3. Resilient mounted, split phase, fan duty motor. No radio interference.
4. Aluminum alloy fan of new and revolutionary shape, pitch and weight to operate with extreme quietness.
5. Sail actuated by air motion of fan opens and closes main gas valve as fan starts and stops.
6. Sturdy motor support attached to unit to overcome vibration.
7. Fan guard in two sections for easy removal.

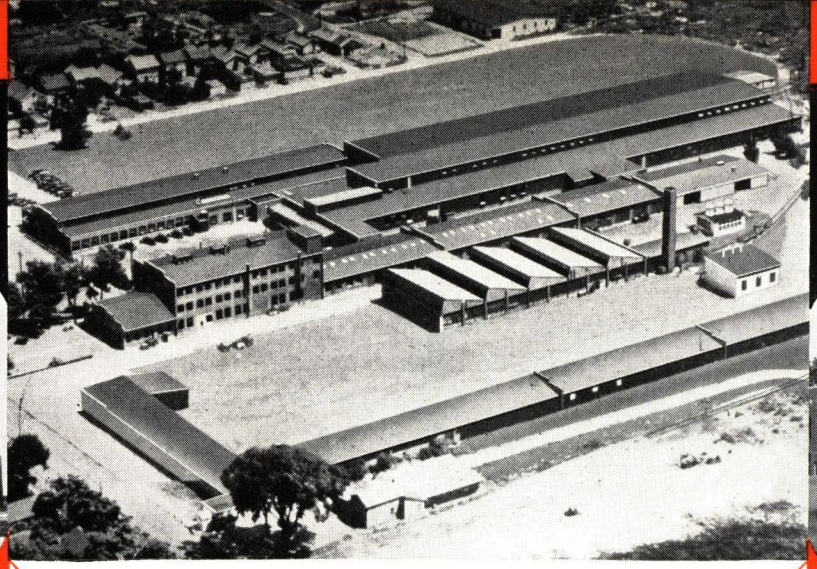


8. Gas actuated automatic control valve opens gas supply to burners when pilot flame is burning and fan is turning, closes gas supply when fan stops or pilot flame fails.
9. Cast iron manifold distributes gas to brass burner orifices mounted in manifold.
10. Bimetal thermal pilot assembly. Pilot flame must be burning before automatic gas valve supplying burners can open.
11. Bottom removable for easy access to burners.
12. All air for combustion taken through these ports.
13. Cast iron burners with cast raised ports accurately machined to gas specifications.
14. Insulation between combustion chamber and casing.
15. Combustion chamber housing burners; ample height to prevent flame impingement.
16. Adjustable horizontal louvres to direct warm air from heater. Vertical or combination vertical and horizontal available for special installations.
17. Collecting chamber into which burned gases empty from vertical radiators.
18. Built-in draft diverter prevents back drafts reaching combustion chamber.
19. Flue connection for flue pipe to chimney or stack.

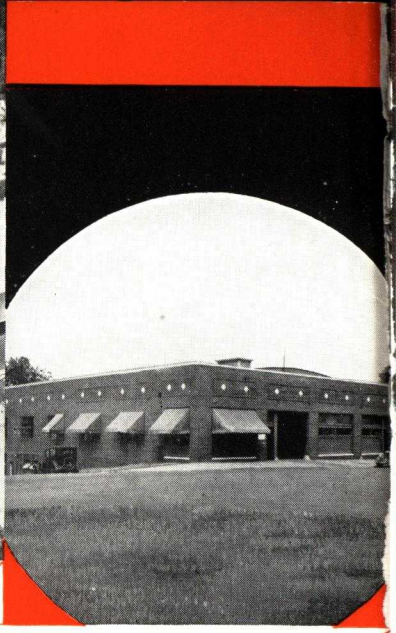
Units are furnished with adjustable gas pressure regulator, main gas line hand valve and safety device to prevent overheating—not shown.



COLUMBUS, (OHIO) PLANT



GENERAL OFFICES AND PLANT
TOLEDO, OHIO



TULSA, (OKLAHOMA) PLANT

ENGINEERING AND SALES SERVICE IN EVERY PRINCIPAL CITY

The services of Janitrol engineers, trained experts in heating and air conditioning, are readily available to all architects, engineers, builders and heating contractors desiring assistance. Layouts, specifications, supervision of installations and servicing of equipment all are furnished from branch offices located to render close, competent, continuous cooperation, everywhere. Whenever you have an air conditioning or gas heating problem, phone, wire or write the nearest Surface Combustion office. A trained sales engineer is always at your service.

NEW YORK
420 Lexington Ave.

PHILADELPHIA
Atlantic Bldg.

BOSTON
The Eastern Appliance Co.
250 Stuart Street

NEWARK
82 Mountain Ave.
North Caldwell, N.J.

WASHINGTON
600 "W" Street, N.E.

PITTSBURGH
601 Grant Bldg.

ERIE
2920 Walnut St.

SYRACUSE
814 Glenwood Ave.

BUFFALO
96 East Depew Ave.

CLEVELAND
East Ohio Gas Bldg.

CINCINNATI
2606 Highland Ave.

COLUMBUS
400 Dublin Ave.

DAYTON
19 Greenmount Blvd.

INDIANAPOLIS
711 Middle Drive, Woodruff Place.

ATLANTA
F. J. Evans Engineering Co.
724 First Nat'l Bank Bldg.

BIRMINGHAM
F. J. Evans Engineering Co.
1206 Watts Bldg.

CHICAGO
122 South Michigan Ave.

DETROIT
3078 East Grand Blvd.

GRAND RAPIDS
Hotel Browning

MINNEAPOLIS
3543 Girard Ave., S.

TULSA
Webster Engineering Co.
419 West Second St.

DALLAS
Gas & Heating Specialty Co.
Second Unit—Santa Fe Bldg.

HOUSTON
Mechanical Equipment Co.
923 M & M Bldg.

ST. LOUIS
Paul Brown Bldg.

KANSAS CITY
Dierks Building

DENVER
670 Emerson Street

COLORADO SPRINGS
Acacia Hotel

SAN FRANCISCO
Natural Gas Equipment, Inc.
1123 Harrison St.

LOS ANGELES
Natural Gas Equipment, Inc.
Petroleum Securities Bldg.

BAKERSFIELD
Natural Gas Equipment, Inc.
526½ Chester Ave.

SURFACE COMBUSTION CORPORATION • TOLEDO, OHIO

Manufacturers of

JANITROL GAS-FIRED PRODUCTS

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TRANE

AIR^n

Heating Cooling and Air Conditioning

PRODUCTS

BULLETIN NO. 290
NOVEMBER 1937

26/25

A Guide to TRANE Products

EACH UNIT PERFORMS IN THE FUNCTION CHECKED

UNIT	Heating	Cooling	Humid.	Dehumid.	Vent.	Air Cleansing	Page
Specialties	×						3
Extended Surface Coils	×	×		×			4 & 5
Convectors	×						6 & 7
Unit Ventilators	×				×	×	7
Unit Heaters	×				×		8 & 9
De Luxe Air Conditioner	×	×	×	×	×	×	10
Commercial Air Conditioner	×	×	×	×	×	×	11
Hotel & Office Air Conditioner	×	×		×	×	×	10
Climate Changer	×	×	×	×	×	×	12 & 13
Comfort Cooler		×		×	×	×	14
Evaporative Condenser		×					13
Railroad Evap. Condenser		×					14
Sub Cooler		×					14
Product Cooler		×					14
Air Washer			×	×		×	14
Pumps	×	×					15
Temperature Control Valve	×						15
Spray Nozzles		×	×			×	15

TRANE

THE TRANE COMPANY, LACROSSE, WISCONSIN

For EASY REFERENCE

The information contained in this bulletin on the various Trane products is meant to be helpful to you in making a quick review of basic equipment in the heating, cooling, and air conditioning fields. The Trane products shown have varied applications. The list is impressive, but far from inclusive. These products are available in a great variety of sizes and styles. On each page of this bulletin, you will find a reference note indicating the proper bulletin for more complete information on the line described on that page. On page 16 you will find an additional list of Trane literature.

A Complete UNDIVIDED RESPONSIBILITY Line

For many years, The Trane Company has directed its entire inventive and production efforts to develop individual equipment that would perform under working conditions in a manner satisfactory to the engineering consultants and contractors in the various fields whose task it is to assemble this equipment into a working system. Throughout these many years, The Trane Company has maintained a reputation for designing and manufacturing related equipment—equipment designed and developed together for service together.

This development work has carried The Trane Company into a position of responsibility in the advanced cycles of heating, cooling, air conditioning, humidifying, dehumidifying, ventilating, and air washing. Considered separately, each of these activities covers vast territory; collectively, they become—Air Conditioning.

Thus, The Trane Company's work with many factors involved in air movement, air control, the use of air for any degree of comfort, has placed The Trane Company in the forefront of all manufacturers of equipment necessary for the furtherance of the user's satisfaction.

The complete line of Trane products, including Heating Specialties, Blast Coils, Cooling Coils, Unit Heaters, Convectors, Unit Ventilators, Evaporative Condensers, Comfort Coolers, Product Coolers, Pumps, and a great variety of Air Conditioning equipment has been developed with one purpose in view—to aid the contractor, engineer, and architect in building and specifying working systems. There is always the proper Trane product to do the work. Purchasers will have a complete installation using the products of one manufacturer — thus enjoying the protection of undivided responsibility.

TRANE

Heating Specialties

(Bulletin V260)

Engineering skill and advanced manufacturing methods enable The Trane Company to build Heating Specialties which stand up under rigorous operating conditions, yet are sensitive enough to function with the utmost precision. Trane has exactly the specialty needed to give longer life, create a definite saving, and assure positive heating satisfaction. Trane Traps have been tested by the U. S. Bureau of Standards and are approved by all Government Departments.

1. The Trane Balanced Pressure Bellows—of multiple corrugated, one-piece construction, are truly the heart of Trane Traps and Vents. Their operation, as an integral part of Trane Heating Specialties, is an important feature in the function of these Specialties. Their precision manufacture and balanced pressure account in a large measure for the long life and dependable operation of Trane Heating Specialties.
2. Low Pressure Bellows Angle Trap—15 Lbs. maximum pressure. Accurate performance. Maximum sensitivity. Ball-tipped plunger closes tightly. Self cleaning, sharp-edge, seat at low point in body.

2a. Low pressure Bellows Offset Trap—for straightway and right or left hand corner installations.

2b. Low Pressure Bellows Vertical Trap—for direct connection to bottom outlet of convectors.

3. High Pressure Bellows Trap—100 Lbs. maximum. Corrosion resisting. Durable. Special metal in seats and plungers to withstand severe service.
4. Medium Pressure Bellows Trap—50 Lbs. maximum pressure. Permanent. No adjustment required. Special alloys for all parts subject to wear.
5. Thermostatic Drip Traps—15 Lbs. maximum pressure. Extra capacity. Compact. Highest quality demonstrated through years of service.
6. Float Vent—20 Lbs. maximum pressure. Quick air venting—water and steam tight. Oversize float and discharge orifice. Vacuum seal.
7. No. 1 Quick Vent
8. No. 2 Quick Vent

   20 Lbs. maximum pressure. Large capacity through ¼" venting port. Genuine Trane balanced pressure bellows. Steam tight, ball-tipped plunger. Vacuum seal.
9. No. 9 Vent Trap—Huge air capacity. Double acting all brass mechanism, non-thermostatic.
10. No. 44 Hermetic Angle Valve—Unexcelled simplicity. Truly packless—leak proof. Easy operation. A reputation for service without maintenance expense.
11. Bellows Angle Valve—Truly packless—leak proof. Non-rising stem.
12. No. 30 Angle Valve—Sturdy—commercial packless construction. Double protection against leakage around stem.
13. Series "A," "C" & "H" Float Traps—Available for low or high pressures. Unique float mechanism assures extra capacity. Protected bellows.

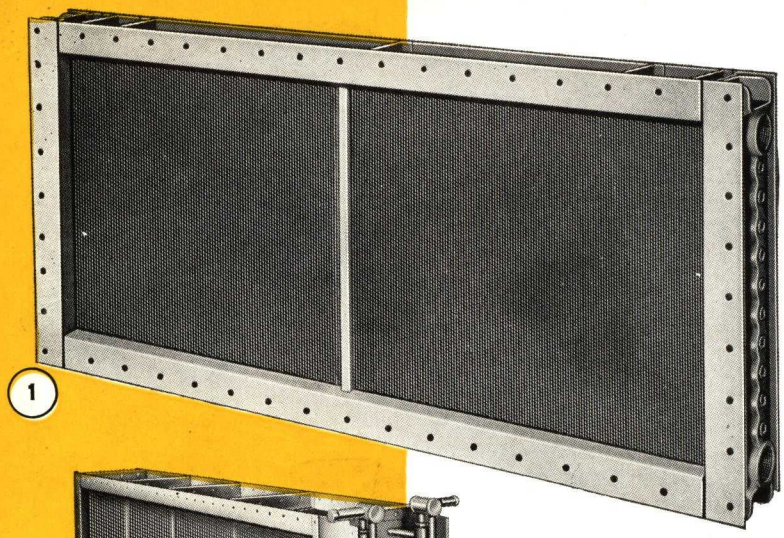
13a. Exterior view of Series "H" Float Trap.

14. No. 210 Direct Return Trap—20 Lbs. maximum pressure. A safety device—automatically returns condensation to boiler. Positive, noiseless operation.
15. Inverted Bucket Trap—A heavy duty trap, extremely long life. Silchrome steel wearing parts withstand severest service.
16. Compound Gauge—Sensitive Bourdon movement. Large readable figures. 30" vacuum, 30 Lbs. pressure.
17. Dirt Strainer—12 mesh brass wire screen. Prevents dirt from interfering with operation of equipment. Easily cleaned.
18. Damper Regulator—Automatically positions draft and damper doors to maintain uniform pressures. Maximum recommended pressure—2 Lbs.

TRANE

Extended Surface

Heating and Cooling Coils

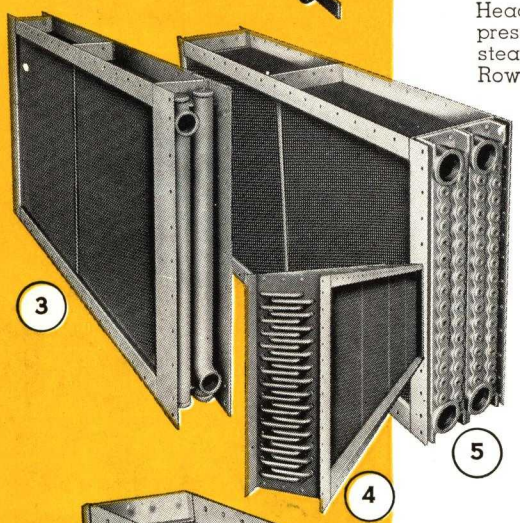


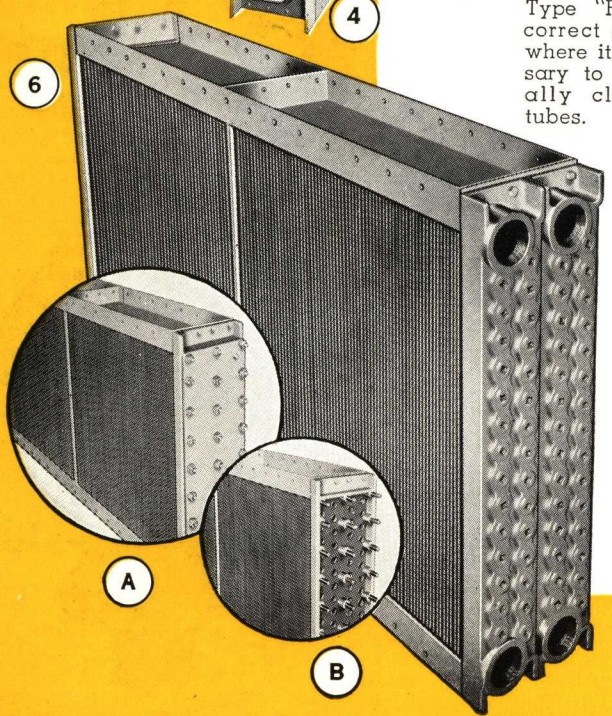
No. 1. Type "E" Trane Extended Surface Coil showing holes in casing for attachment to duct work. Types "E" and "C" handle steam or hot or cold water and serve both heating and cooling purposes.

No. 2. The Trane Direct Expansion Coil is the ideal choice when a direct expansion refrigerant is used for cooling.

No. 3. Trane Welded Header Coil — for high pressures or superheated steam. No. 4. A Four-Row Type "S" Single Row Serpentine Coil showing U-bend connections. No. 5 shows the Type "S" cast iron header arrangement. The Type "S" Coil is especially designed for water cooling.

No. 6. Type "R" water cooling coil. (A)—Opposite end of coil with cover plate in place. (B)—Cover plate removed to show tube arrangement. Type "R" is the correct selection where it is necessary to occasionally clean the tubes.





Many are the reasons for the superiority of The Trane Extended Surface Coil. It is light in weight, compact, and space saving. It has a higher heat conductivity. It requires fewer piping connections. It has lower friction.

Round seamless tubes of pure copper are normally furnished. To meet definite conditions, tubes are, on occasion, made of red brass or other materials. In all sections of more than one row, the tubes are staggered to provide an even distribution of the air over the heating surfaces.

Flat, plate type fins constructed either of aluminum or copper are used on all standard Trane Coils. A spacing collar is formed at each tube opening and is drawn to the proper height to provide the required standard fin spacing. Each fin is continuous across the entire width and depth of the coil section, and these fins are mechanically bonded to tubes by a special expanding process which makes them permanent, integral parts of the tube. Each Trane Coil is thoroughly tested in accordance with rigid Trane standards before shipment.

No matter what the application, commercial or industrial, a Trane Coil can be supplied to meet the requirement.

TYPES "E" & "C" (Bulletin 152)

Trane Type E Blast Coils are for heating and ventilating applications using steam or hot or cold water. Headers are close-grained cast iron, accurately machined and tested. Flanges are drilled for easy attachment to duct work. The entire core floats independently in the casing, automatically compensating for expansion. Red brass tubes are normally furnished where pressures higher than 25 pounds are desired; copper tubes are standard for lower pressures.

Type C Blast Coils are the same as Type E Coils, with the exception of the casing. Type C Coil casings are not drilled for duct connections and have no bolting flange around the headers. They are intended primarily for applications where they are built into a heating or cooling unit.

DIRECT EXPANSION (Bulletin 172)

The Trane Direct Expansion Coil embodies the same sturdy fin and tube construction as other Trane Coils —the dual contact between tube and fin, the correct ratio of secondary to prime surface. The major differences are special header construction and serpentining. A vertical bronze header automatically distributes the gas in equal amounts to each tube in the circuit. Even temperatures over the face of the coil are achieved. Trane Direct Expansion Freon Coils are tested and are listed in accordance with the requirements and specifications of the Reexamination Service of Underwriters' Laboratories, Inc. Each coil carries the Underwriters' Laboratories Reexamination service marker.

TYPE "S" (Bulletin V292)

The Trane Type "S" Serpentine Water Coils have been designed for use on cooling systems where

clean chilled water is used. The Type "S" is available in two models—the single-row serpentine and the two-row serpentine. The former is ideal where water quantities are limited, while the latter is the choice when an ample water supply is at hand. They eliminate space-consuming special fittings and piping inter-connections.

WELDED HEADER COILS (Bulletin 162)

The particular requirements of special drying equipment call for a coil of special design and construction. Trane meets these requirements with the Welded Header Coil. This coil may be used where there are steam pressures up to 350 pounds, or where superheated steam is encountered. It embodies welded headers of heavy copper tubing. The casings are of 14 and 16 gauge galvanized steel. Drilled flanges are provided on all sides for duct work attachment, and for bolting sections together in multiple groups. Round seamless pure copper tubes of ¾" O. D. are used in all Welded Header Coils.

TYPE "R" (Bulletin 182)

With the same fin and tube construction as the other Trane Extended Surface Coils, Type "R" has a special header design which facilitates making multiple coil assemblies. In applications where it may be necessary to clean the tubes occasionally, the end plate can be removed from the coil opposite the piping connections and easy access to the tubes secured. The gasket assures a perfectly tight joint when the plate is placed back in position.

TRANE BOOSTER COILS (Bulletin V252)

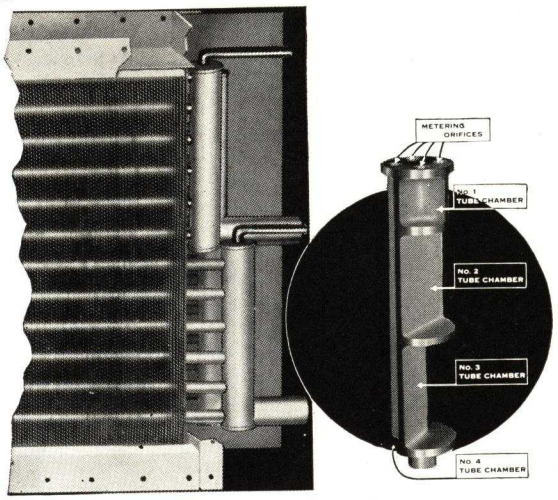
The compact Trane Booster Coils are ideal for booster type heating, ventilating, and air conditioning systems where air is heated in a central equipment room and then distributed throughout the building. A Booster Coil installed in each branch duct may be regulated by room thermostats and thus provide independent temperature control in the various rooms.

RANGE OF COIL SIZES

Coil	From	To	Series*	Number** of Sizes and Combinations	Standard Widths	Service
Type "C"	12" x 12" 1-Row	30" x 120" 2-Row	45, 75, 85 (Water Coils in Series 85 Only)	594	12-15-18 21-24-30	Heating and Cooling
Direct Expansion	12" x 24" 2-Row	32" x 120" 6-Row		330	12-16-24-32	Cooling with Refrigerant
Type "S"	18" x 18" 2-Row	30" x 120" 6-Row		225	18-24-30	Cooling with Water
Welded Header	12" x 12" 1-Row	30" x 120" 3-Row	45, 75, 85	945	12-18-24-30	High Pressure Heating
Type "R"	24" x 24" 4-Row	30" x 120" 8-Row		105	24 & 30	Cooling with Water
Type "E"	12" x 12" 1-Row	33" x 120" 2-Row	45, 75, 85	616	12-15-18-21-24-30-33	Heating
Booster Coil	6" x 12" 1-Row	10½"x72" 2-Row	45, 75, 85	284	6-7½-9-10½	Heating and Cooling

*Series Number indicates number of fins per lineal foot of coil.
**Standard length. There is an infinite variety of intermediate lengths.

Special Features

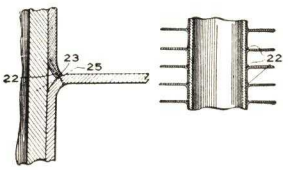


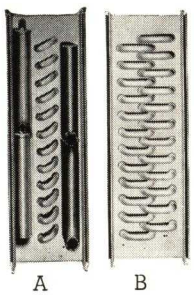
Above is a sectional view of a Trane Direct Expansion Coil showing the header arrangement. Inset shows the vertical bronze distributor header which automatically meters the gas in equal amounts to the tube circuits.

At left: A sectional view through the header of a Trane Extended Surface Coil. Note the cut open tube showing tight fit of extended fins to tube and orifice distribution bushing.

Right shows a typical fin for 18" 2-row Blast Coil showing spacing collars. Each fin is continuous across the entire width and depth of the coil section, thus exposing only smooth edges to air travel with a consequent minimum of air friction.

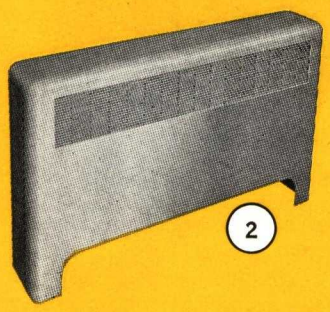
The diagram at the right illustrates the details of the dual contact and method of applying fin to tube. The fins are mechanically bonded to the tubes by a special expanding process which makes each fin, in effect, a permanent, integral part of the tube. No solder, brazing, or welding process is necessary.

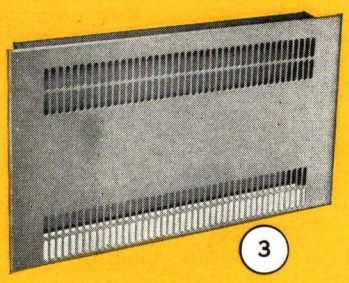


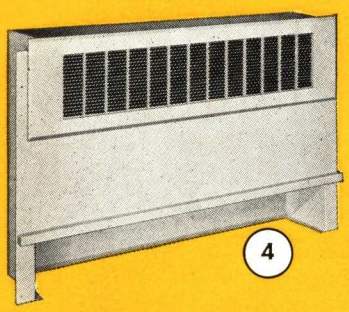


At the left are two typical header arrangements on standard serpentine design of Direct Expansion Coils. Figure (a) shows Liquid (left) and Suction Headers. Return U-Bends are illustrated by Figure (b).

At right above are Header views showing removable cleanout plugs on one row and two row coils. This arrangement is the same on both Type "C" and Type "E" coils.







TRANE
Convectors

(Sales Bulletin 110, 268, 105 and 266. Data Bulletin V205)

The Trane Non-Ferrous Convector—modern successor to the old-fashion cast iron radiator—provides instant, even heat to any room space. Constructed in fifteen basic types, the Trane Convector may be placed on the floor, partially or totally concealed in the wall, or hung completely exposed on the wall. The Trane Convector operates successfully on all types of steam and hot water heating systems.

No. 1. Type FK Convector with Double-Formed grille and damper.

No. 2. Type FK Convector with Free-flo Grille. An exposed model, ideal for new or remodeling installations. Only slightly different is the Type FG which has an inlet grille at the bottom of the cabinet.

No. 3. Type RG Convector for installation in wall recesses. Either Free-flo or Double-Formed outlet grilles may be used. Also available without inlet grille.

No. 4. Type PK Convectors. All of the unit except the grilles is hidden in the wall. Throat extension allows for the use of plaster, tile, or panel walls. Also obtainable in a PG Type having inlet grilles.

Not shown is the Type W, a wall cabinet that is easily hung between window apron and baseboard or on a blank wall. Other types include: The SK, with a semi-recessed cabinet, the exposed corners of which are rounded. The SG, also semi-recessed, utilizes an inlet grille. The PKF and PFG, to be plastered in an insulated opening. The MKL and MGL, consisting only of the heating element and a front panel. The MKR and MGR, consisting of the heating element and a front panel to give a semi-recessed appearance.

Trane Convectors with the graceful rounded corners on the exposed units lend beauty to their surroundings. With Trane Convectors the architect is given a tool that allows him complete freedom in his quest for symmetry and pleasing design.

Instantly responsive to changing heat requirements, these trim units require only the turn of a valve or adjustment of a damper. Comfortable heat is immediately delivered to every corner, preparing the room for immediate occupancy. Just as easily is the command to stop heating given. Only by nature's own laws of convection and the high conductivity of non-ferrous metals is this quick, positive heat possible.

Dust and dirt are not deposited on walls and expensive drapes where Trane Convectors are used. Trane Convectors are clean. They circulate the air down to the floor and out into the rooms where it brings true comfort to the occupants.

Even heat throughout the room prevents draft. No wide range of temperature is found between floor and ceiling. The child playing on the floor is safe from unhealthful effects of improperly heated rooms.

CONDENSED CAPACITIES AND RANGE OF SIZES

SIZES:

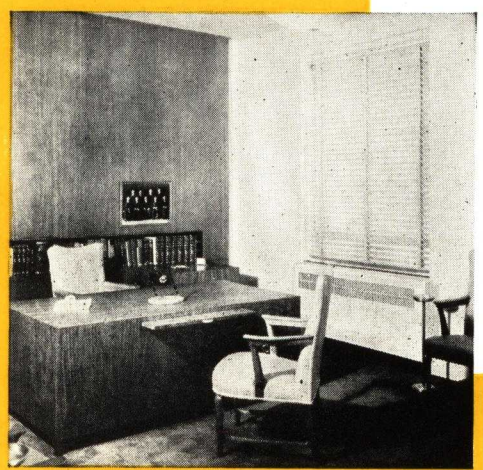
Five Depths—3⅝", 5⅝", 7⅝", 10⅞" and 14⅞".
Ten Lengths—From 14" to 60" inclusive.
Nine Heights—From 18" to 38" inclusive.

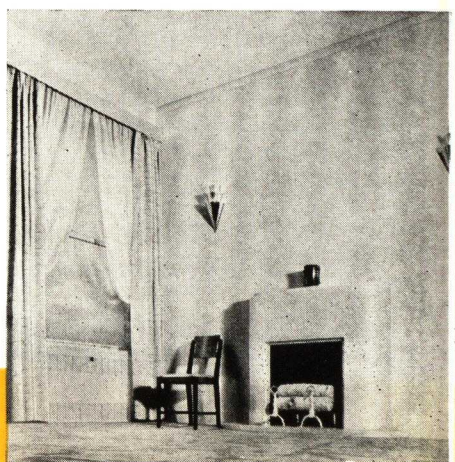
CAPACITIES:

Range of 7.5 to 148.5 square feet.

TYPES:

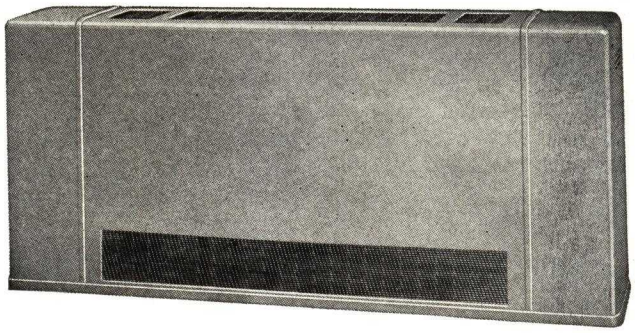
Fifteen basic types including concealed, recessed, semi-recessed and exposed models.





TRANE
Unit Ventilators

(Sales Bulletin 65. Data Bulletin V230)



ECONOMY

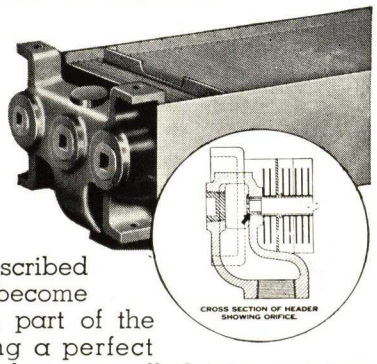
The initial cost of Trane Convectors is surprisingly low. Light weight and scientific design keeps installation expenses at a minimum. Only simple piping connections need be made by the contractor. Trane Convectors may be placed in existing buildings as easily as they may be included in new building plans.

Because of instantaneous response, Trane Convectors economize on heat. No valuable heat is wasted by opening windows to cool an overheated room. No chilly wait for a room to warm up. No valuable heat radiated into walls to be dissipated to the outside. Trane Convectors direct the heat to the living zone. No valuable heat wasted through stratification at the ceiling. Trane Convectors keep the air in gentle circulation. Fuel is saved. Comfort is assured.

CASING CONSTRUCTION

The Trane Convector is light in weight yet strongly constructed. The casing is made of highest grade furniture steel. Scientifically designed grilles effectively mask the interior while providing effective distribution of heat. Because of its compact construction, valuable space is economized to be used for other purposes.

THE CONVECTOR ELEMENT



The heart of the Trane Convector is the Trane Non-Ferrous Heating Element. It consists of copper tubes to which by a patented process, non-ferrous metal fins are joined, as illustrated and described on page 5. The fins become in effect an integral part of the tubes thereby giving a perfect heat transfer unit. Tubes are rolled into cast iron headers in boiler tube style insuring against leaks. The heating element is guaranteed to withstand pressures up to 150 pounds per square inch.

FORCE-FLO CONVECTOR

The Trane Force-Flo Convector makes use of a standard heating element together with a motor and blower assembly all enclosed in a beautiful cabinet. Cold air is drawn from the floor by a quiet-operating blower fan, discharged over the heating element where it is warmed by convection, and then circulated quietly but positively out into the room. A small unit, it delivers a relatively large quantity of heat. Ideally suited for showrooms, lobbies, stores, and corridors where space is at a premium.

THE TRANE AIR-O-LIZER

The Trane Air-O-Lizer is an outstanding unit ventilator. Designed to meet all state and local requirements for heating and ventilating in the schoolroom. Proper mixtures of outdoor and recirculated air are heated by Trane No-Draft Heating Coils. Durable dampers may easily be adjusted to give any desired mixture of air. Either automatic or manual control of heat and dampers may be used. Pure filtered air is gently discharged in the room by quiet blowers.

The Air-O-Lizer attractively fits into any room design. Rounded corners not only add to its beauty but protect children from painful injury caused by falling against sharp corners. Completely enclosed, inquisitive fingers cannot venture within the cabinet, yet the cabinet front is easily removed by simple key arrangement for filter cleaning and motor oiling.

Strongly constructed and thoroughly sound-proof, the Air-O-Lizer is available in a variety of sizes to meet all requirements.

SERIES "A"

Constant Amount of Outdoor Air

Air-O-Lizer C. F. M.	Air-O-Vent C. F. M.
750 to 1,560	2,000 to 6,000

SERIES "B"

Variable Amount of Outdoor Air

Air-O-Lizer C. F. M.	Air-O-Vent C. F. M.
750 to 1,560	2,000 to 6,000

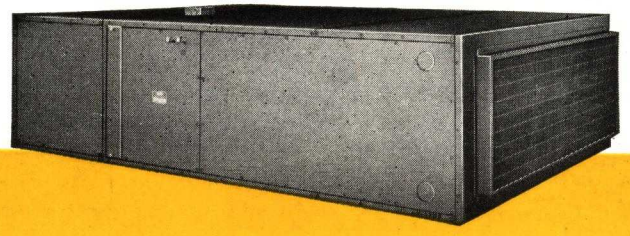
SERIES "C"

Variable Quantity of Outdoor Air with a Fixed Minimum

Air-O-Lizer C. F. M.	Air-O-Vent C. F. M.
750 to 1,560	2,000 to 6,000

THE TRANE AIR-O-VENT

A large capacity unit ventilator, the Air-O-Vent is particularly adapted for use in auditoriums, gymnasiums, or other places where many people assemble. Two types, horizontal or vertical, are available in either bare or complete units.



TRANE
Unit Heaters

The Trane Projection Unit Heaters. The Multiple Unit at left. Above: the circular single fan unit.

The Trane line of unit heaters —the most complete commercial range available—has been amplified to include two distinctly different units—new in appearance and revolutionary in method of operation, known as—

PROJECTION HEATERS

(Bulletins 284 and 294)

The Trane Projection Heater and the Trane Multiple Projection Heater are compact, light weight, easy-to-install unit heaters of the propeller type. Both of these units have the same operating characteristics, the same advantages, and they successfully embody a new way of carrying and diffusing a vertical heated air stream with a maximum of floor coverage. Designed for high ceiling mounting where they are out of the way and also for low ceilings where head room is limited. With these projection type unit heaters the warm upper air is **drawn through** the coils and then projected straight downward to the floor by the new Trane four blade propeller fan especially designed for silent operation. The air stream, at an initial high velocity, induces a large volume of room air in its downward course, and reaches the floor at a negligible velocity with a tendency to spread and create a true comfort zone.

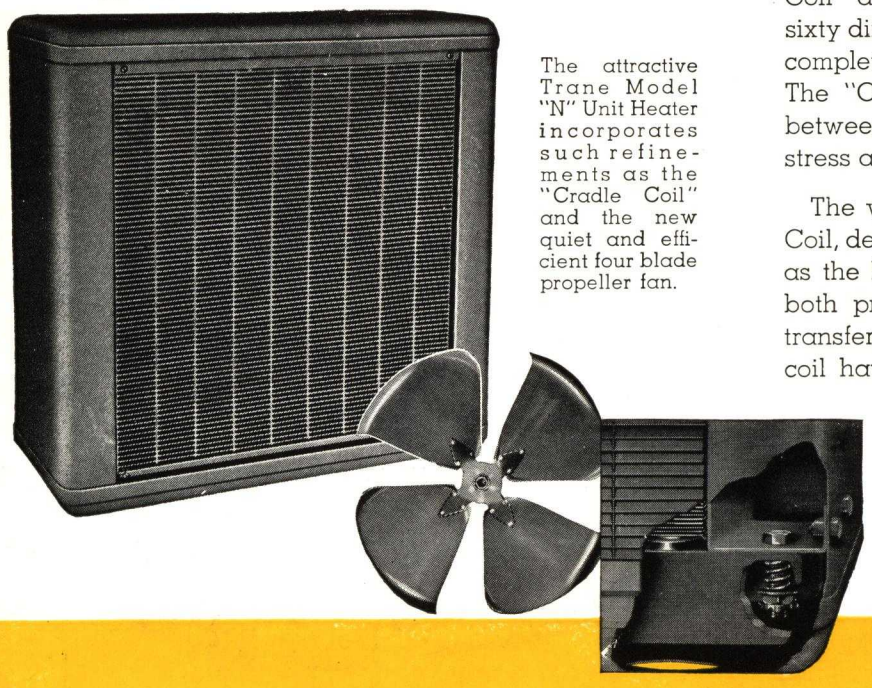
The Trane Multiple Projection Heater consists of two Trane Extended Surface Coils contained within a sturdy metal casing. The Trane Projection Heater is a two-row circular coil mounted between two circular plates. The upper plate is the supporting backbone of the unit. The lower provides the fan orifice. The motors in Projection Heaters are mounted on resilient constructions, in the units, and out of the path of all heated airstreams.

The Trane Multiple Projection Heater combines the lightness, flexibility, and the moderate price of the propeller type unit heater with the long range delivery and large capacity of the heavier, more costly blower type unit heaters. It is a multiple fan unit with each fan under individual control at a substantial power saving. It is the ideal choice where a maximum of space must be heated with a minimum of units.

MODEL "N" UNIT HEATERS

(Bulletin 85)

The advantages of the unit method in all types of commercial and industrial heating have long been apparent.



The attractive Trane Model "N" Unit Heater incorporates such refinements as the "Cradle Coil" and the new quiet and efficient four blade propeller fan.

In the practical Model "N" line of Trane Unit Heaters, embodying such refinements as the "Cradle Coil" and the new "Free-flo" Grille, there are over sixty different standard styles and sizes with the most complete range of capacities commercially available. The "Cradle Coil" eliminates the rigid connection between coil and casing and is insurance against stress and strain caused by expansion.

The well known Trane Extended Surface Heating Coil, described on page 5 of this bulletin, is employed as the heating element in all Trane Unit Heaters—both propeller and blower types. The high heat transfer qualities and the durable construction of this coil have made it a favorite with heating and air conditioning engineers everywhere.

Trane Unit Heaters can be used for either steam heating at pressures up to 150 pound, or on positive circulation hot water heating systems where water temperatures are 160° or higher.

TORRIDOR UNIT HEATERS

(Bulletin 75)

The Trane line of unit heaters is rounded out by a wide variety of blower types — Trane Torridors. The Torridor is designed for large space heating with a minimum of units. Because of their high velocity characteristics they are popular for duct work applications, and are unexcelled for floor installations where the discharged horizontal air stream must be carried to considerable distances. The Torridor is ideal where outside air must be introduced through ducts. Trane Torridors are built in floor, ceiling, and wall models.

These units are available in either direct drive or belt driven models. The belt driven models are more frequently used because of their many operating advantages and their increased flexibility.

BUILT FOR PERMANENCE

Trane Torridors are built for long and constant use. The casing is constructed of high grade steel, spot welded to heavy angle iron frame work. The motors are of standard manufacture for blower type unit heater work.

Ball bearings are used on the drive shafts with all bearings out of the path of the heated air stream. The quiet, vibrationless, scientifically constructed Trane Forward Curved Blade Fan is employed. The patented Trane Guide Flange removes all expansion stress from coil tubes and headers. Every refinement of advanced manufacturing process and material is embodied in these practical units.

CONTROLLED HEAT DISTRIBUTION

To effect efficient and economical heating, air must be **directed,** not "dumped." The Trane Multiflector Grille is used to split up the air leaving a Torridor nozzle and direct its flow in either one, two, or three directions. With this simple, inexpensive device it is unnecessary to purchase split nozzles to secure special air deflection.

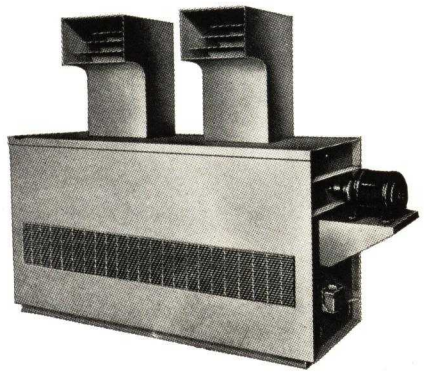
PERFORMANCE

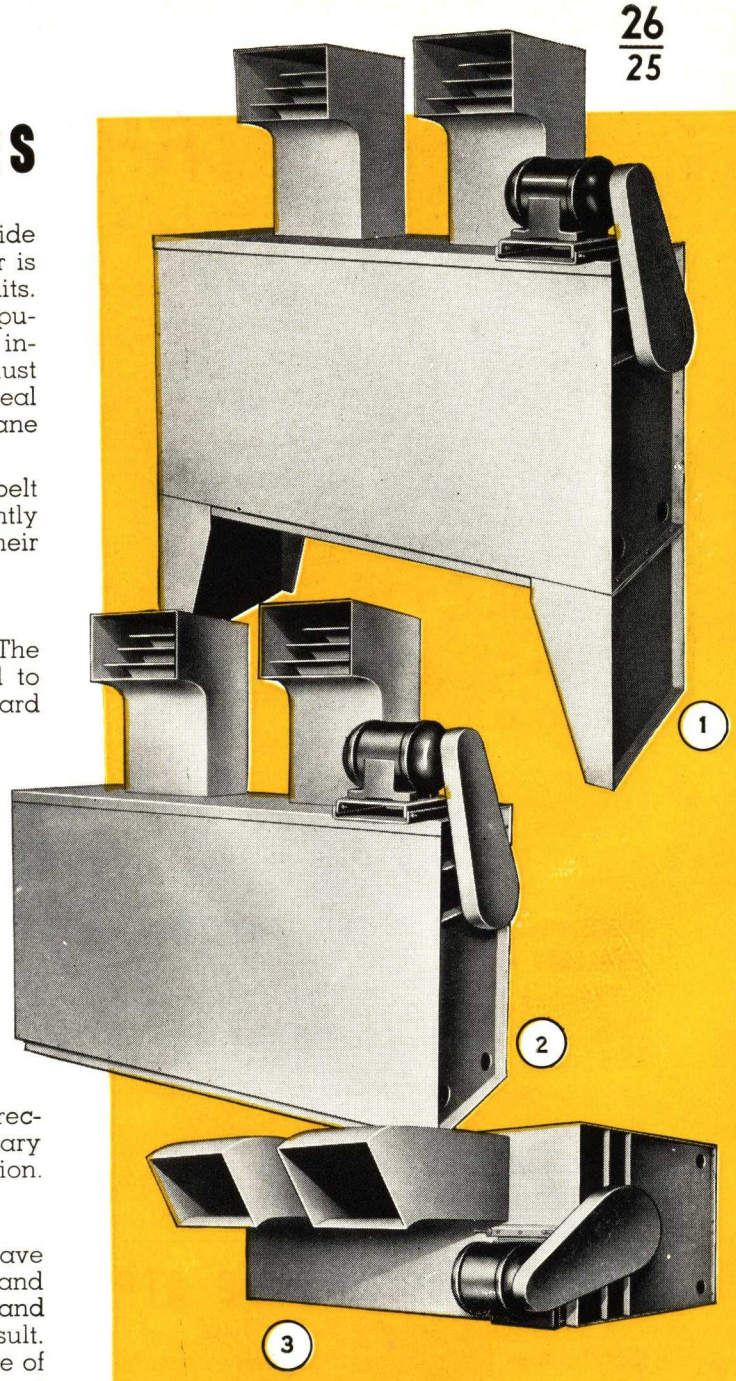
Trane Torridors handle large volumes of air which leave the units at a low temperature normally between 120° and 135°. This is the ideal temperature range for both throw and diffusion, and a high degree of heating comfort is the result. Because of the flexibility of Trane Torridor design, the use of two or three outlet nozzles, and the directional flow features of the Multiflector Grille, a single Torridor frequently does work normally requiring two units.

TRANE TORRIDORS WITH BY-PASS CONTROL

Trane Torridors using the Thermadjust system of control are fitted with a system of dampers which by-pass air around the heating coil when less heat is required.

In many types of installations it is desirable to keep constant the amount of heat discharged. The Thermadjust system of control is widely specified by engineers for just such applications.





RANGE OF UNIT HEATER SIZES

Unit	B.t.u. Range*	No. of Standard Sizes	C.F.M. Range
Multiple Projection Heater	From 350,000 to 1,000,000	4	From 4810 to 13,750
Projection Heater	From 52,000 to 285,000	5	From 960 to 5,250
Model "N" Unit Heater	From 21,000 to 400,000	70	From 410 to 5,000
Torridor	From 134,200 to 1,287,000	72	From 1575 to 19,730

*Standard Steam Rating at 2 pounds steam pressure and 60° entering air temperature.

TRANE
DeLuxe
Air Conditioner

Sales Bulletin 235. Data Bulletin V271)

Attractive appearance is combined with outstanding Trane features in the DeLuxe Floor Type Air Conditioner to give the finest equipment for year around comfort.

The Trane DeLuxe Floor Type Air Conditioner is a styled piece of furniture that blends into the background of any interior design. The smart shop, the pretentious home, the store, and the office all are enhanced by the addition of this completely enclosed unit. Rounded corners conform to the trend of modern streamlining. Brown krinkle enameled casing is standard. If preferred, a gray priming coat may be obtained for final finish on the job to match exactly the colors of the room.

Designed in several different cabinet sizes the DeLuxe Floor Type Air Conditioner may be obtained in many more additional capacities by varying the size of the coil.

Standard equipment includes the famous Trane Cooling Coil for use with direct expansion refrigerant, cold city or well water, chilled water or brine. Large blower type fans operate quietly to discharge large quantities of air through Trane Free-flo Grilles. Motors are especially designed for quiet operation. The fans are mounted on shafts supported by pillow block bearings and are belt driven.

Optional equipment includes removable throw-away or permanent filters, as well as the famous Trane Extended Surface Coil for heating with hot water or steam. Humidification is obtained with the Trane Target Type Humidifying Spray Nozzle.

CONDENSED CAPACITIES FOR LARGEST AND SMALLEST SIZES

Entering Air 80° D. B. and 50% Relative Humidity; Entering Refrigerant, either water or direct expansion, 40°.

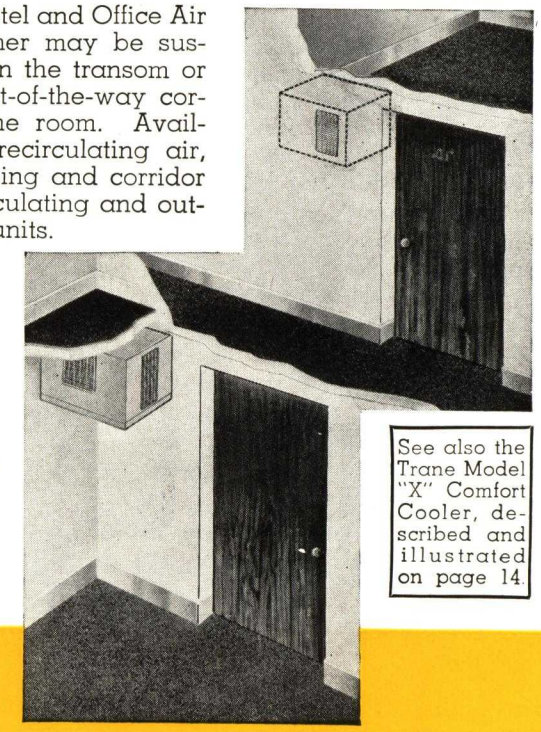
UNIT	C.F.M.	Water	Direct Expansion
From No. 52-2	300	9,600 Btu	8,200 Btu
to No. 122-5	2,500	129,000 Btu	97,000 Btu

HOTEL AND OFFICE AIR CONDITIONER

(Sales Bulletin 235. Data Bulletin V241)

A suspended unit, the Trane Hotel and Office Air Conditioner finds its greatest use in the hotel room and the small office space. It provides refreshingly cool air by means of the famous Trane Cooling Coil. Chilled water, cold water, or direct expansion refrigerants may be used as the cooling medium. Copper wool filters are optional. If cold water is used, hot water may be circulated in the same coil for winter heating. Fans are the quiet blower type direct driven by motors tested for balance and quietness. Casings are strongly constructed of 16-gauge furniture steel. Brown krinkle enamel is the regular finish furnished on this unit.

The Hotel and Office Air Conditioner may be suspended in the transom or in an out-of-the-way corner of the room. Available in recirculating air, recirculating and corridor air, recirculating and outside air units.



See also the Trane Model "X" Comfort Cooler, described and illustrated on page 14.

CONDENSED CAPACITIES FOR LARGEST AND SMALLEST SIZES

Entering Air 80° D. B. and 50% Relative Humidity; Entering Refrigerant, either water or direct expansion, 40°.

UNIT	C.F.M.	Water	Direct Expansion
From No. 105-2	250	9,600 Btu	8,400 Btu
to No. 108-4	990	40,089 Btu	35,200 Btu

TRANE
Commercial Air Conditioner

(Sales Bulletin 235. Data Bulletin V234)

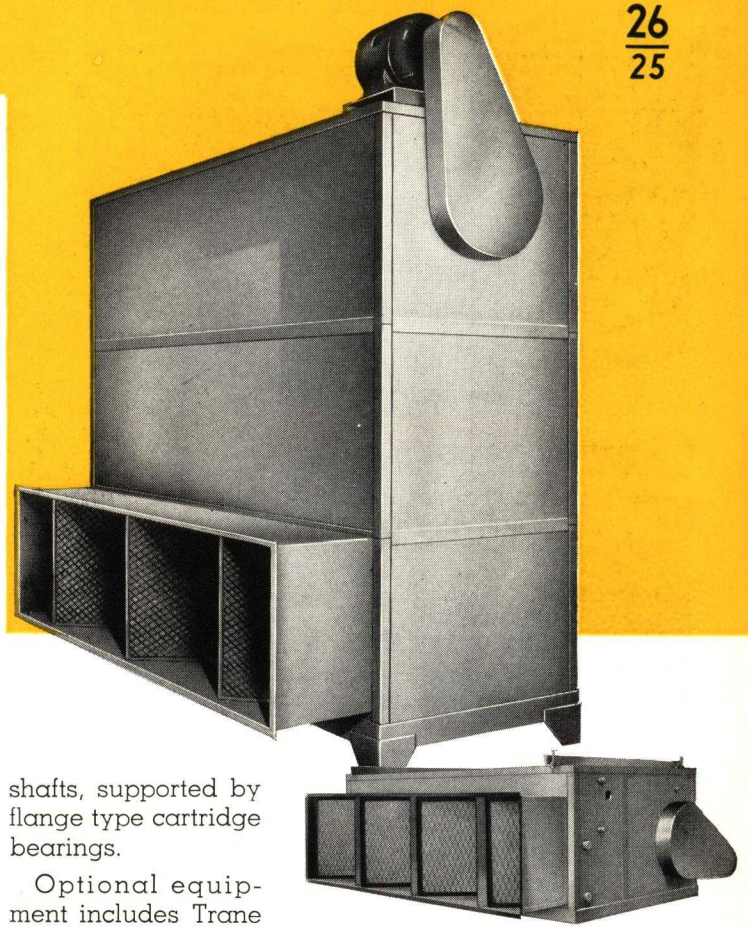
A Trane Commercial Air Conditioner houses in one compact unit all the equipment necessary to provide complete year around control of the air in any space.

Two models are available. The suspended model is intended for use where floor space is at a premium. By suspension from the ceiling, seldom used space is utilized without interference of any kind. Where it is not advisable to suspend the unit, a floor model is available that requires only the smallest possible amount of floor space. The floor model will fit in a convenient closet, service room or in a recessed opening in a corridor. The floor model comes knocked down in three parts ready for quick assembly.

By varying the size of the coil in the nine cabinet sizes a wide range of capacities is available.

The heart of the large Trane Commercial Air Conditioner is the famous Trane Cooling Coil. With slight variations cold water, city or well, chilled water or direct expansion refrigerants may be circulated in the coil to effectively cool and dehumidify. No matter how high outside temperatures soar the Trane Coil provides the temperature most suitable for comfort.

Large blower type fans, especially constructed by Trane, quietly draw large volumes of air over the coil, discharging and circulating it throughout the conditioned space. Fans are belt driven for closer adjustment of fan speed. Open type motors of standard manufacture are located out of the air stream in easily accessible positions. Fan assemblies consist of the fans mounted on highly polished steel shafts, supported by flange type cartridge bearings.



Optional equipment includes Trane Extended Surface Coils for winter heating. Hot water or steam may be used. Filter sections using replaceable throwaway V Type Filters are available in special casings to remove dust and dirt from the incoming air. Non-clogging atomizing spray nozzles for economical and efficient humidification are also included when ordered. Provision may also be made at either the front or back of the unit for return or fresh air duct connections. The Trane Commercial Air Conditioner may use 100% recirculated air or 100% fresh air or any percentage combination of the two.

The entire unit is housed in a casing of 16-gauge finest grade furniture steel. Heavy angle iron frame rigidly supports the unit. The entire casing is insulated to prevent sweating and to eliminate noise, and then painted with gray primer. This allows the user to finish it on the job with matching colors.

Where partitioned spaces are to be conditioned the units, either floor or suspended models, may be used with duct systems. For large open spaces outlet nozzles are provided. With either arrangement the unit operates with the same effectiveness.

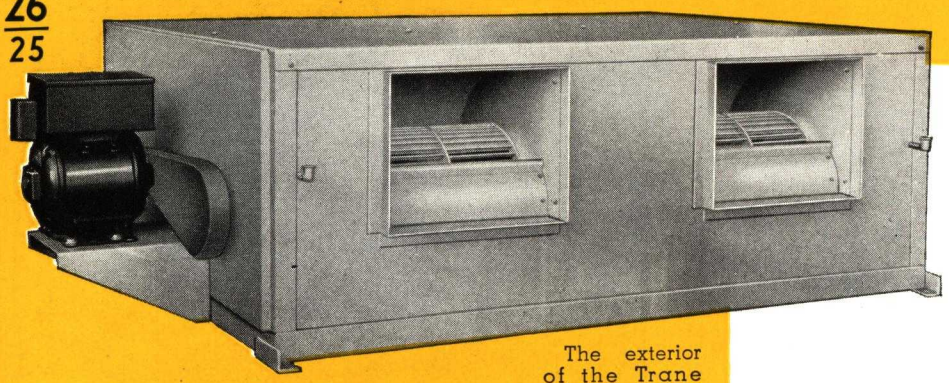
When ordered complete the Trane Commercial Air Conditioner furnishes complete air conditioning including Cooling, Dehumidification and Ventilation with Air Cleansing in the summer cycle, and Heating, Humidification and Ventilation with Air Cleansing for the winter cycle. The unit is equally adaptable to comfort or to process installation.

CONDENSED CAPACITIES FOR LARGEST AND SMALLEST SIZES

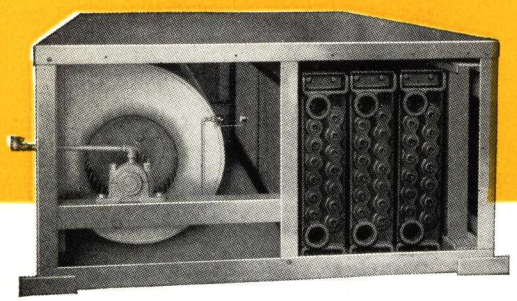
Entering Air 80° D. B. and 50% Relative Humidity; Entering Refrigerant, either water or direct expansion, 40°.

Commercial Suspended and Floor Model Units

UNIT	C.F.M.	Water	Direct Expansion
From No. 2203 and No. 2103	3,000	65,200 Btu	63,000 Btu
To No. 8212 and No. 8112	12,000	433,000 Btu	432,200 Btu



The exterior of the Trane Climate Changer is shown above. At right the side panel removed showing blower humidifier coils and filter.



TRANE *Climate Changer*

(Bulletin 230)

Large Trane Blower Fans operate quietly to force a huge volume of conditioned air in the duct work for perfect distribution to every nook and corner of the building.

A wide range of capacities allows the Climate Changer to fit many applications. One easily-selected unit will air condition the average home. In larger buildings, a Trane Climate Changer may be installed on each floor.

The Trane Climate Changer—the complete year 'round air conditioning unit for the home, apartment and small building. It may be used with either hot water or steam systems for effective winter heating. Any standard cooling medium may be used to create refreshing, invigorating atmosphere during scorching summer days.

The Trane Climate Changer is a substantially constructed unit, made for long life. It may be located in the basement of the home or placed in a convenient closet in the apartment. (In many instances existing duct work may be utilized.) Because of careful designing for easy access to interior parts, installation is simplified. The casing bottom is fabricated of 12-gauge steel amply insulated and water-tight. Sides and top are of 16-gauge steel with rigid framework for strong construction.

In winter operation, famous Trane Extended Surface Heating Coils are used. If water is used as the cooling medium, the same coil can be used for heating and cooling. Summer dehumidification is accomplished by the coils to furnish complete comfort cooling.

Replaceable viscous type air filters cleanse the air of bacteria-laden dust and dirt. Construction is such that filters may be easily removed.

In winter the Trane Climate Changer guards the occupants of the building against colds and nasal irritations with proper humidity. The Trane Target Type Spray Nozzle scientifically moistens the air.

INDIVIDUAL APARTMENT AIR CONDITIONING

With the Trane Climate Changer, the apartment house field has at last found a unit to fit its exacting needs. With each apartment equipped with a Climate Changer, each tenant may choose his favorite temperature without interfering with his neighbor. Only air from the one apartment is recirculated in that particular Climate Changer. There is no chance for odors or air borne disease germs to spread from one apartment to another as would be the case in the ordinary central fan system. Yet one boiler system may supply the requirements of the Climate Changer in every apartment. Only those apartments actually occupied need be supplied.

CONDENSED CAPACITIES FOR LARGEST AND SMALLEST SIZES

HEATING

65° Entering Air; 2 lbs. Steam Pressure

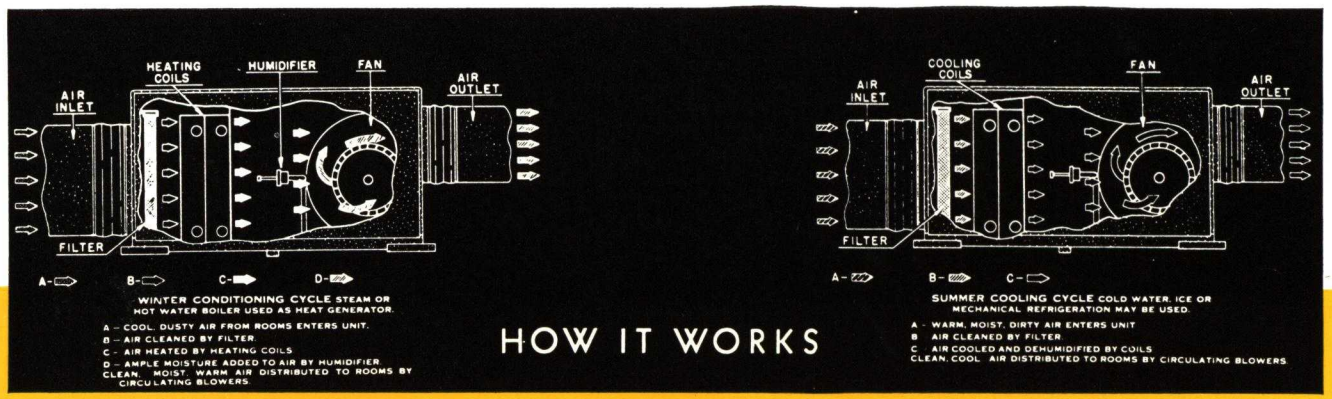
UNIT	B.t.u.	C.F.M.
From No. 0	33,000	650
to No. 6A	360,000	4780

COOLING

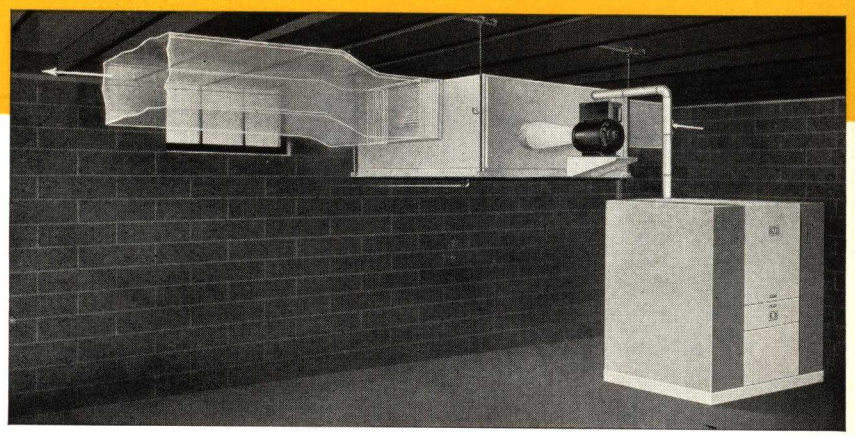
85° Entering Air; 50% Relative Humidity

D.E. 40° Gas B.t.u.	Water or Brine 50° B.t.u.
22,000	24,700
131,000	139,500

HOW IT WORKS



THE TRANE DUAL SYSTEM OF AIR CONDITIONING

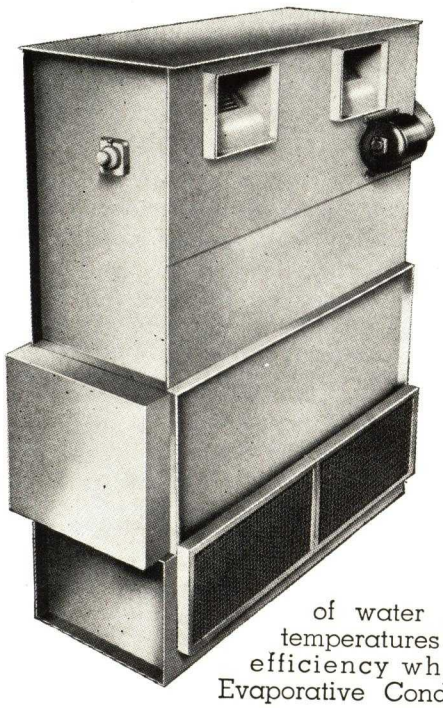


A typical basement installation showing Trane Climate Changer, boiler and duct work.

The Trane Dual System has been devised to produce complete air conditioning in certain sections of the home providing heating and humidification only for the remainder. That favorite living room or the bedrooms may be cooled as a refuge against summer heat.

The Trane Climate Changer provides all-year comfort to that part of the home which is selected. The remaining rooms are heated with Trane Convectors. (See page 6.) The Climate Changer and Convectors are supplied with steam or hot water by the same boiler system.

In many locations city or well water cold enough to be used as a refrigerant is obtainable. This cold water may be circulated in the Climate Changer and then used for other domestic purposes such as lawn sprinkling. In this manner cooling is obtained at almost no cost because the water is used for other natural purposes. Heating with the Climate Changer costs no more than with other methods. Winter humidification takes very little additional water. The cost of renewing filters is almost negligible.



TRANE *Evaporative Condenser*

(Sales BulletinV42. Data Bulletin V98)

The Trane Evaporative Condenser is used to condense refrigerants in any compressor system. Recirculated spray water absorbs the heat from the condenser coil. In turn, the spray water is cooled by evaporation. All need for cooling towers, tower pumps, and the large amount of space necessary to house such bulky equipment is eliminated. With the use of the Trane Evaporative Condenser, water costs are slashed as much as 95% in comparison with other means of condensing. Only a small amount of water is lost by evaporation. Expensive service lines and the operation of large pumping equipment is not necessary. Power costs are reduced substantially. There is no problem of water disposal, found so often in cities where sewers are already overloaded. Scarcity of water or high water temperatures do not impair efficiency where the Trane Evaporative Condenser is used.

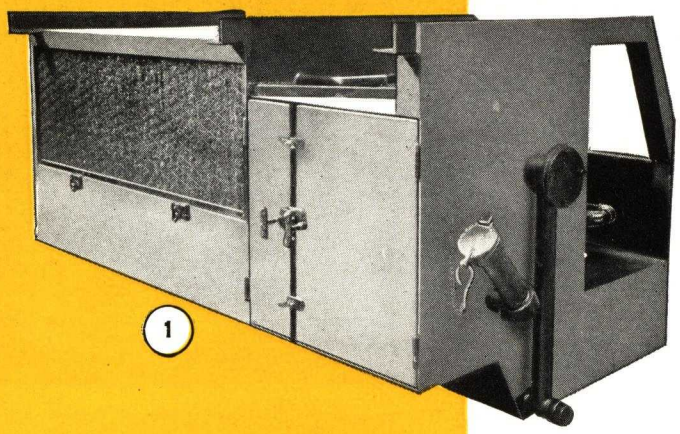
The Trane Evaporative Condenser is available in two models, Series K and J. The K Series are manufactured for installations requiring unit capacities up to 110 tons. The J Series are compact units with one motor driving the fan and pump for small installations.

The famous Trane Extended Surface Coils, Pumps, Blowers, and Spray Nozzles are used. These products are described elsewhere in this bulletin. The casing is of 12 and 14 gauge, rigidly-braced steel. The larger units are shipped in three sections.

CONDENSED CAPACITIES FOR LARGEST AND SMALLEST SIZES

Entering Air 78° W.B.; 105° Condensing Temp. Freon or Methyl Chloride

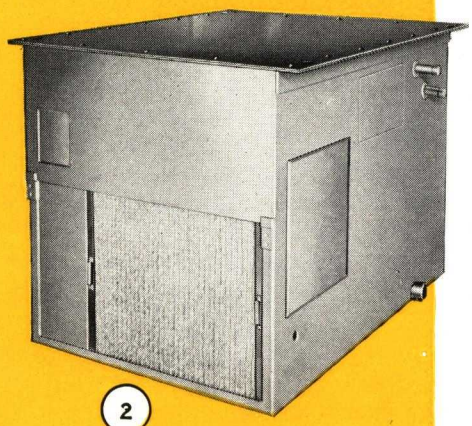
UNIT	B.t.u. per hour
From No. J3	36,500
to No. J10	130,500
From No. K108	171,000
to No. K2410	1,245,000



26
25

Rounding Out The TRANE Line

Trane in its long career to control the air in which we live, to regulate its temperature and humidity, to properly circulate that air to its appointed place, has developed a line of outstanding products. The variations for their use are multiple. As new needs arise, new products are developed. On the following pages, a brief description of the products that complete the Trane Line are given.



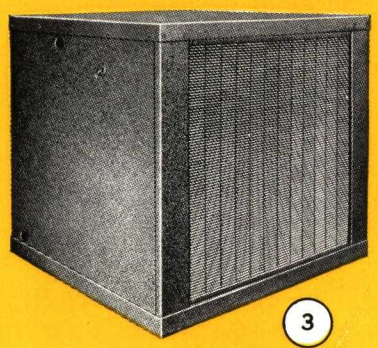
1 TRANE RAILROAD EVR EVAPORATIVE CONDENSERS

Trane has a complete electro-mechanical system of Railway Air Conditioning, including motors, compressors, EVR Condensers, and subcoolers. In addition, a complete line of floor and suspended air conditioning and cooling units using direct expansion refrigerants or water is available.

An important product is the EVR Evaporative Condenser for under-car installation. When installed on equipment designed for air condensers, increased capacity is assured. The fresh air supply may be increased; cooler conditions maintained; or lower compressor speeds may be obtained. Excess noise and vibration is limited. Condenser coils are of the copper tube and fin type.

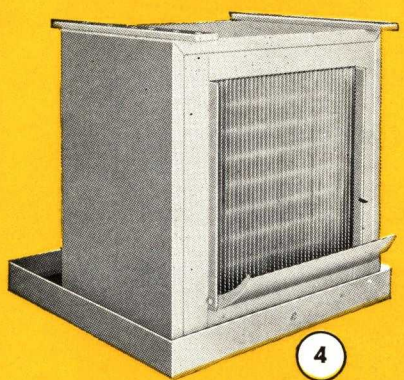
2 REFRIGERANT SUB-COOLERS

Trane Refrigerant Sub-Coolers increase the efficiency of air condensers. Power requirements are sharply reduced when installation is made between air condenser coils and receiver. Capacity is increased when installation is made in the liquid line between receiver and expansion valve. Cleaning of Air Filter and Water Filter, and pump inspection are the only maintenance requirements.



3 THE TRANE TYPE X PROPELLER COMFORT COOLER (Bulletin V285)

The Trane Type X Propeller Comfort Cooler combines the famous Trane Cooling Coil with the Quiet Trane Fan in a draw-through spot cooler. It is an inexpensive unit, intended primarily for service where water is the cooling medium. It is manufactured in two sizes, the larger of which will accommodate a 6-row cooling coil. The casing is attractively finished in brown krinkle enamel. The Trane Free-Flo Grille directs cool air to the floor line, besides adding neatness to the unit.

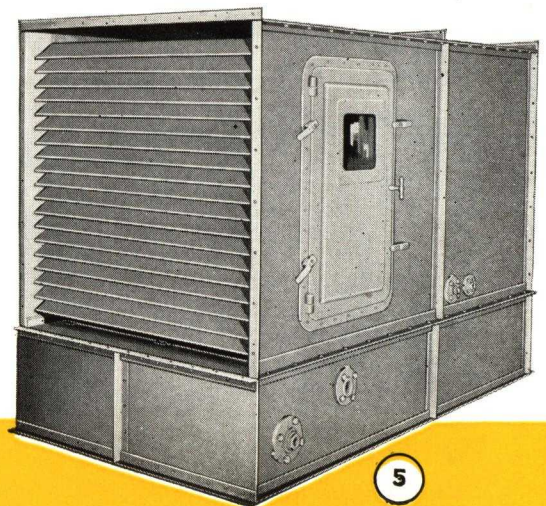


4 THE TRANE PRODUCT COOLER (Bulletin V25)

The Trane Product Cooler, a compact, easily-installed unit, provides refrigeration for storage rooms to protect meat, vegetables, dairy products, malts, and other perishables. The unit may be used with the present refrigeration system. The Trane Coil of the unit may be furnished for any standard refrigerant. An ingeniously constructed drain pan prevents damage to stock. Defrosting periods are of short duration.

5 TRANE AIR WASHERS

This unit provides humidification for the average commercial heating and ventilating system. Air passing through the device is washed, purified and humidified. Trane Washer Type Spray Nozzles are used in conjunction with brass flooding nozzles. The same high quality Trane construction is found in this unit. Special metals may be used if required.

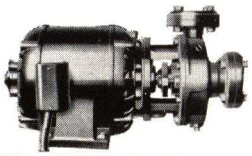


From top to bottom: (1) The Trane EVR Evaporative Condenser for Railroad Air Conditioning. (2) The Subcooler used with Air Condenser equipment to increase efficiency of Railroad Air Conditioning. (3) The Trane Type "X" Propeller Comfort Cooler. (4) The Trane Product Cooler, is used to maintain constant temperatures in food and perishable storage space.

CONDENSATION PUMPS (Bulletin 33)

Trane Condensation Pumps are furnished on heating systems where condensate will not return to the boiler by gravity. The assembly consists of the following: pump motor, float switch control, receiving tank, piping between pump and tank, companion flanges for suction and discharge, motor protective equipment.

Condensation pumps are available in several styles. The 400 Series has a capacity equivalent to 4000 sq. ft. of direct radiation. The Pedestal Style with 13 gallon tank has a maximum capacity of 10,000 sq. ft. The Pedestal Style with 28 gallon tank has capacity to 40,000 sq. ft. The Duplex Pedestal Style with the same capacity as the Pedestal Style is built with two motors and pumps to be operated singly or together for peak periods.



CIRCULATING AND BOOSTER PUMPS

The Trane Company manufactures three types of Circulating and Booster Pumps. The SSU Model is a vertical split case pump mounted on the motor end plate and connected directly to the motor shaft. The SSC has the same characteristics except the mounting is made on a cast iron base. The pump is connected to power by a flexible coupling. Both models are for jobs requiring not over 250 G.P.M. against heads not exceeding 100 feet.

The SK Model is a horizontal split case double suction unit designed for heavy pumping duties. Capacities range from 100 G.P.M. against heads up to 250 feet.

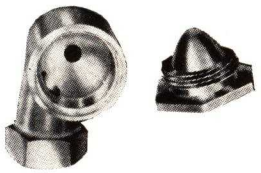
CONDENSED CAPACITIES

UNIT	Radiation in Square Feet		Max. Pressure At Pump	
	From	To	From	To
Pedestal Tank	6,000	30,000	10 lbs.	60 lbs.
Duplex Pedestal Style			10 lbs.	60 lbs.
400 Series	4,000		10 lbs.	60 lbs.

TEMPERATURE CONTROL VALVES (Bulletin 215)

Designed to maintain any set temperature between 63-77 degrees, they find their greatest use on Convectors or radiators in apartments, hotels, office buildings, hospitals, and dormitories. The control bulb is placed in the entering air path to govern the valve attached to the supply end of the heater. They are planned for use only on vapor or vacuum systems and are highly desirable where fuel savings are important.

TRANE WASHER TYPE SPRAY NOZZLES



The Washer Type Spray Nozzle develops a fine spray at pressures of from 15 to 20 pounds. Large water passage prevents clogging. Spray head cap is removable. Especially designed for air washer and evaporative condenser use.

TRANE TARGET TYPE SPRAY NOZZLES

The Target Type Spray Nozzle atomizes the water passing through it. At 50 pounds pressure, it requires two gallons of water per hour. A self-cleaning device automatically reams the small orifice when water supply is closed off. Ideal for humidification in any air conditioning application.

TRANE

OVER 70 BRANCH OFFICES

The Trane Company maintains sales and service facilities in principal cities throughout the country. One of these offices is located near you—completely staffed, ready to serve your needs in Heating, Cooling or Air Conditioning.

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Available TRANE LITERATURE

The Trane Company makes available for the engineer, architect and contractor accurate and inclusive data on Heating, Cooling, and Air Conditioning equipment and applications. The material is in bulletin form, 8½" x 11" size, carefully arranged and profusely illustrated for convenient reference.

HEATING

Bulletin 110—TRANE CONVECTORS
A general bulletin of Convector application information. Design and construction. Typical installations. 24 pages.

Bulletin V205—TECHNICAL DATA ON TRANE CONVECTORS
Models. Designs. Applications to vapor, vacuum, hot water, and one-pipe steam systems. Installation details. Piping connections. Specifications. Roughing-in dimensions. Capacities. 28 pages.

Bulletin 102—A SIMPLIFIED METHOD OF FIGURING RADIATION
How to figure radiation without the aid of tables. Practical examples. Written for the layman. 4 pages.

Bulletin 65—TRANE AIR-O-LIZERS
Trane Unit Ventilator for schoolroom heating and ventilating. Operating cycles and features. 8 pages.

Bulletin 284—TRANE PROJECTION UNIT HEATERS
Bulletin 294—TRANE MULTIPLE PROJECTION HEATERS
Revolutionary new draw-through propeller type unit heaters. Construction. Features. Advantages. Trane patented Temperature Equalizing. System. Examples of fuel saving. Roughing-in dimensions and capacities. Bulletin 284 covers single fan units. Bulletin 294 covers two and three fan units. Each bulletin 8 pages.

Bulletin 75—TORRIDOR UNIT HEATER BULLETIN
Description. Operation. Sizes. Capacities. Wiring diagrams. Piping details. Application suggestions. Selection data. Roughing-in dimensions. Specifications. 24 pages.

No. V177—TRANE EXTENDED SURFACE COILS
Types "E" and "C" for blast heating and water cooling.

Bulletin V268—TRANE CONVECTORS
Data for jobbers and dealers. Six reasons why Convectors are the ideal heating unit. Installation details, connections, and capacities. 8 pages.

Bulletin 105—TRANE ORIFICE SYSTEM
Advantages. Explanation of low installation and maintenance costs. Applications. 8 pages.

Bulletin V260—TRANE HEATING SPECIALTIES
Construction and operation of traps, valves, vents, and specialties for heating systems and industrial applications. Technical data. Pipe size details. Application suggestions. Roughing-in dimensions. Weights. Capacities. 36 pages.

Bulletin 85—TRANE PROPELLER TYPE CRADLE COIL UNIT HEATERS
Where and how to use. Explanation of Cradle Coil and Floor-Line-Spread. Data on over sixty sizes. How to figure special capacities. Control. Piping and wiring diagrams. Roughing-in dimensions. Capacities. 16 pages.

Bulletin 152—TRANE EXTENDED SURFACE HEATING COILS
Hot water capacities. Construction. Heating surface and air friction tables. Selection guide. Temperature rise chart. Piping and installation details for high and low pressure systems. Methods of applying automatic temperature control. Pipe sizing. Performance. Specifications. Roughing-in dimensions. Capacities. 40 pages.

COOLING

Bulletin 42—TRANE EVAPORATIVE CONDENSERS
Where and why used. Operation features. Construction details. Dimension and capacity data. 4 pages.

Bulletin V98—TECHNICAL DATA ON EVAPORATIVE CONDENSER
Advantages. How they operate. Construction. Installation and maintenance. Use of capacity tables. Cooling data. Specifications. Roughing-in dimensions. Capacities. 12 pages.

Bulletin 172—TRANE DIRECT EXPANSION COOLING COILS
Complete, accurate data on direct expansion cooling. Design. Selection. Piping details. Header arrangements. Properties of air and water mixtures. Heat content of air data. Trane psychrometric chart. Refrigeration pipe sizes. Roughing-in dimensions. Capacities. 28 pages.

Bulletin V292—TYPE "S" WATER COOLING COILS
Supplement to Bulletin 182. Trane Type "S" Coils. Roughing-in dimensions. 4 pages.

Bulletin 285—TRANE TYPE "X" COMFORT COOLER
Designed for applications where water is used as a refrigerant. For small and medium size jobs. Features and operation. Installation. Roughing-in dimensions. Capacities. 2 pages.

AIR CONDITIONING

Bulletin V234—TECHNICAL DATA ON COMMERCIAL AIR CONDITIONERS
36 pages.

Bulletin V271—TECHNICAL DATA ON DE LUXE FLOOR MODEL AIR CONDITIONERS, 16 pages.

Bulletin V241—TECHNICAL DATA ON HOTEL AND OFFICE AIR CONDITIONER, 12 pages.
The technical aid conditioning bulletins above contain control, duct work details, application suggestions, specifications, roughing-in dimensions and capacities, and valuable general air conditioning data.

Bulletin V239—TRANE AIR CONDITIONING INSTALLATIONS
A host of outstanding Trane Air Conditioning installations. 20 pages.

Bulletin 182—WATER COOLING AND HEATING COILS
Applications of water cooling with examples. Operating cost charts. Coil construction. Heat content of air data. Properties of air and water mixtures. Mean temperature differences. Piping details. Specifications. Roughing-in dimensions. Capacities. 32 pages.

CONTROLS, by C. L. Ringquist
Series of articles assembled in bulletin form. Thorough technical discussion of controls for every phase of air conditioning. Complete tables and engineering examples. Drawings show operation of each control system.

ARTICLES, by William Goodman
Reprints of published articles covering interesting points in air conditioning. (1) "Air Conditioning Problems Solved by Spray Water—Air Chart." (2) "How to Avoid Trouble on Cooling Jobs with Evaporators Above Condenser." (3) "Pumping Head on Air Conditioning Systems Reduced by Using Siphon." (4) "Solving the Four Types of Process Air Conditioning Problems." (5) "How to Solve Heat Transfer Problems." (6) "Dehumidification of Air With Coils." (7) "New Uses for the Psychrometric Chart in Simplifying Air Conditioning Problems."

Bulletin V235—TRANE AIR CONDITIONERS
DeLuxe, Hotel and Office, and Commercial Air Conditioners. Trane Evaporative Condensers. Operating features explained. 16 pages.

Bulletin 230—TRANE CLIMATE CHANGERS
Year around air conditioners for residences and small buildings. Construction. Control. Installation. Data on Split System. Roughing-in dimensions. Capacities. 8 pages.

GENERAL

Bulletin 290—TRANE PRODUCTS
The complete Trane line of Heating, Cooling, and Air Conditioning equipment at a glance. Capacity ranges. Index to all Trane bulletins. 16 pages.

Bulletin 33—TRANE PUMPS
Condensation Pumps and Circulating Pumps. Construction. Roughing-in dimensions. Capacities. Performance. Specifications. 8 pages.

Bulletin B212—TRANE SYSTEMS
Pertinent facts on Trane year around Air Conditioning, the Split System, the Orifice Convector System, and the Vapor Convector System. 16 pages.

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THE VILTER MFG. CO.

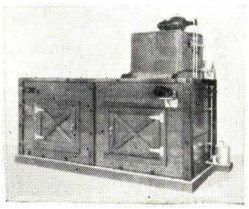
Complete Air Conditioning, Refrigerating and Ice Making Equipment for Product and Comfort Cooling

2250 South First Street
MILWAUKEE, WIS.

VILTER
SINCE 1867

Pak-Icer (Vertical)

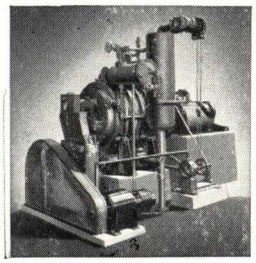
Produces Crystalform Pak-Ice in any amount up to 5 tons in 24 hours. Unit comprises a complete ice making freezer with 2, 3 or 5-ton storage bin. Machine is entirely automatic requiring only starting, stopping and occasional inspection. Crystalform Pak-Ice is the perfect form of ice for fish packing, sausage making, milk crate icing, fruit and vegetable shipping, etc.



Pak-Icer (Vertical)

Pak-Ice (Horizontal)

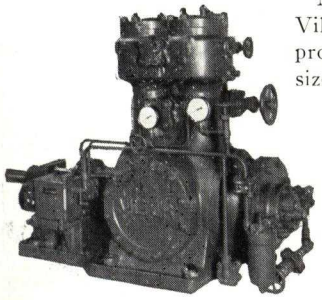
An unusually successful method of producing a superior form of ice for food product icing during transportation in either briquette or crystalform. Pak-Ice stores easily, does not cake together and requires a minimum of handling. This machine reaches full production rate within 20 minutes after starting. Single machine capacity up to 30 tons; multiple machine installations for greater requirements. A complete Pak-Ice plant requires one-tenth the floor space of an equal capacity can ice plant.



Pak-Ice (Horizontal)

Ammonia Compressors

Modern design—the result of Vilter's unceasing testing and improvement. A complete range of sizes and styles from 2 tons up.



Ammonia Compressor

"Freon 12" Compressors

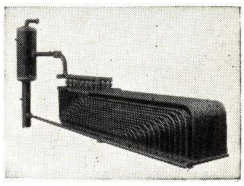
Outstanding features exclusive with Vilter—all sizes equipped with rotary shaft seal for positive protection against leaks—friction losses and power reduced to a minimum.

Two-Stage Compressors

A complete line of two-stage compressors for flexible capacity and economical production of low temperatures. Where compression ratios greater than 10 to 1 exist continuously, two-stage compression will effect substantial savings in power input and will outlast a single stage compressor under like conditions.

Brine Tank Coils

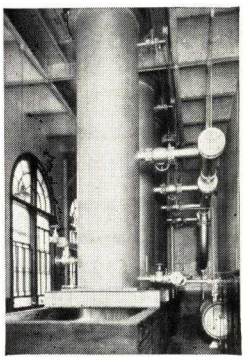
Special design for flooded operation permitting maximum refrigerating capacity with minimum space requirements. Liquid ammonia is prevented from returning to the compressor even when subjected to frequent and large load variations.



Brine Tank Coils

Shell and Tube Equipment

Condensers in all desired sizes and styles from small 1-ton horizontal continuous pass up to the largest vertical. Also a complete line of water and brine coolers.



Shell and Tube Equipment

Air Washers

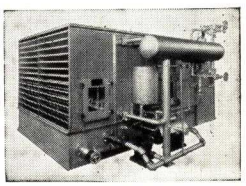
For positive control of humidity, temperatures and circulation of air in industrial air conditioning. Automatic or hand operated. Odors and dust removed by water spray. No filter replacement. Low cost operation.

Booster Compressors

Enclosed vertical type in a wide range of sizes. Maximum capacity with a minimum of floor space for low temperature work.

Spray Type—Dry Coil—Air Conditioners

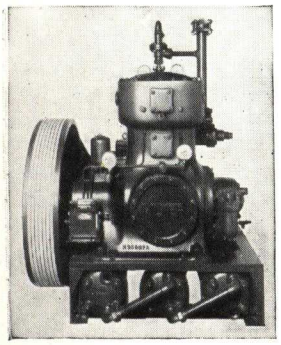
Complete range of sizes—dry coil and spray type—from smallest ceiling units to largest floor type and central systems.



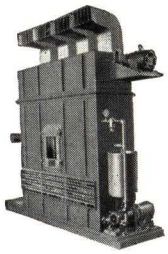
Air Washer

Pipe Coils

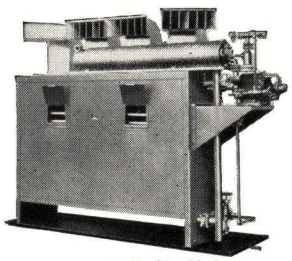
Pipe coils of all sizes and descriptions.



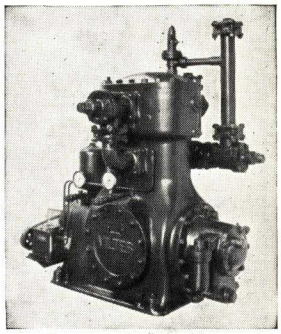
"Freon 12" Compressor



Spray Type Air Unit



Dry Coil Air Unit



Booster Compressor

Complete Stock of Ammonia and "Freon 12" Valves and Fittings

WESTINGHOUSE ELECTRIC & MFG. CO.

MANSFIELD, OHIO

For Reference to Other Products, see File Index

AIR CONDITIONING

Westinghouse provides an outstanding line of equipment, *especially designed* for air conditioning application. The line includes condensing units, of 1 to 40 tons capacities, which may also be used in multiple for larger installations. It includes evaporators, air conditioning units, the famous self-contained *Mobilaire* Room Cooler. Westinghouse also builds *steam jet* refrigerating machines for larger systems, where a suitable supply of steam and cooling water is available. All of this equipment is in wide use today, and has proved exceptionally efficient and dependable.

New Hermetically-sealed Condensing Units

Newest development by Westinghouse is a complete line of *hermetically-sealed* condensing units for air conditioning. Forty percent smaller in size, as much as 50 percent lighter in weight, these new machines permit greater flexibility in the design of systems, save money in original installation costs and upkeep.

The entire operating mechanism is enclosed in one solid casting, then sealed in this armor of steel, eliminating protruding shafts and troublesome "stuffing boxes." The crankshaft runs the full length of the housing, being direct-driven by the motor located inside the casting. So free from vibration is this construction that a coin will stand *on edge* on top of the unit while it is running.

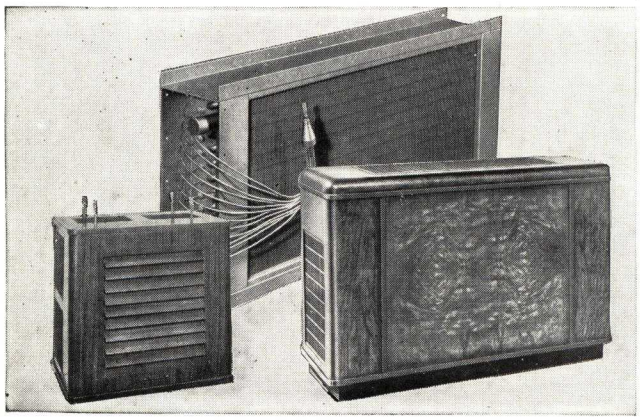
Water-cooling of the complete mechanism, *including the motor,* permits installations in unventilated locations without impairing efficiency. New oiling system, with pressure feed, assures proper lubrication at all times.

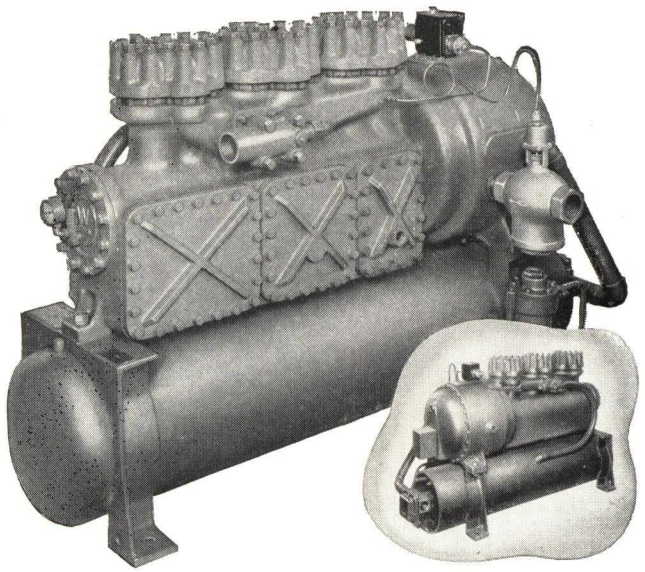
By removing the side plates of the crankcase casting, the entire operating mechanism is accessible for adjustment and service. No refrigerant or water lines need be disconnected. Nor need the unit itself be disturbed.

Truly a remarkable engineering achievement, with no less than 17 outstanding features, the new Westinghouse Hermetically-sealed Unit warrants your most serious consideration.

Evaporators and Conditioning Units

Westinghouse has developed a complete line of extended surface Freon Evaporators exactly matching in capacities the new Hermetically-sealed Condensing Units. When installed with a proper size condensing unit, they cool and dehumidify the air.





Westinghouse Hermetically-sealed Unit, Type CLS-795
Rated capacity 266,400 B.t.u./Hr.; weight 2,000 lbs.

Westinghouse provides over 30 different styles and sizes of air conditioning units in ceiling, wall or floor types, available for summer conditioning, winter conditioning, or complete year around service.

Standard Water-cooled Mobilaire

A self-contained room cooler, the Westinghouse *Mobilaire* provides complete summer air conditioning by cooling, dehumidifying, filtering and gently circulating the air. Easily installed in any room where electrical and water connections are available. It is powered by the famous Westinghouse Hermetically-sealed Mechanism, which is backed by a 5-year warranty.

Engineering Service Available

Your local Westinghouse Air Conditioning Distributor has engineers thoroughly familiar with Westinghouse equipment and its application. Moreover, they know climate, load factors, water temperatures and construction problems peculiar to your city. You'll find them competent to select equipment and build standard and tailor-made systems for your clients' specific requirements—for stores, offices, clubs, theatres, restaurants, etc. You will find them responsible in every respect, making good their guarantees of complete satisfaction.

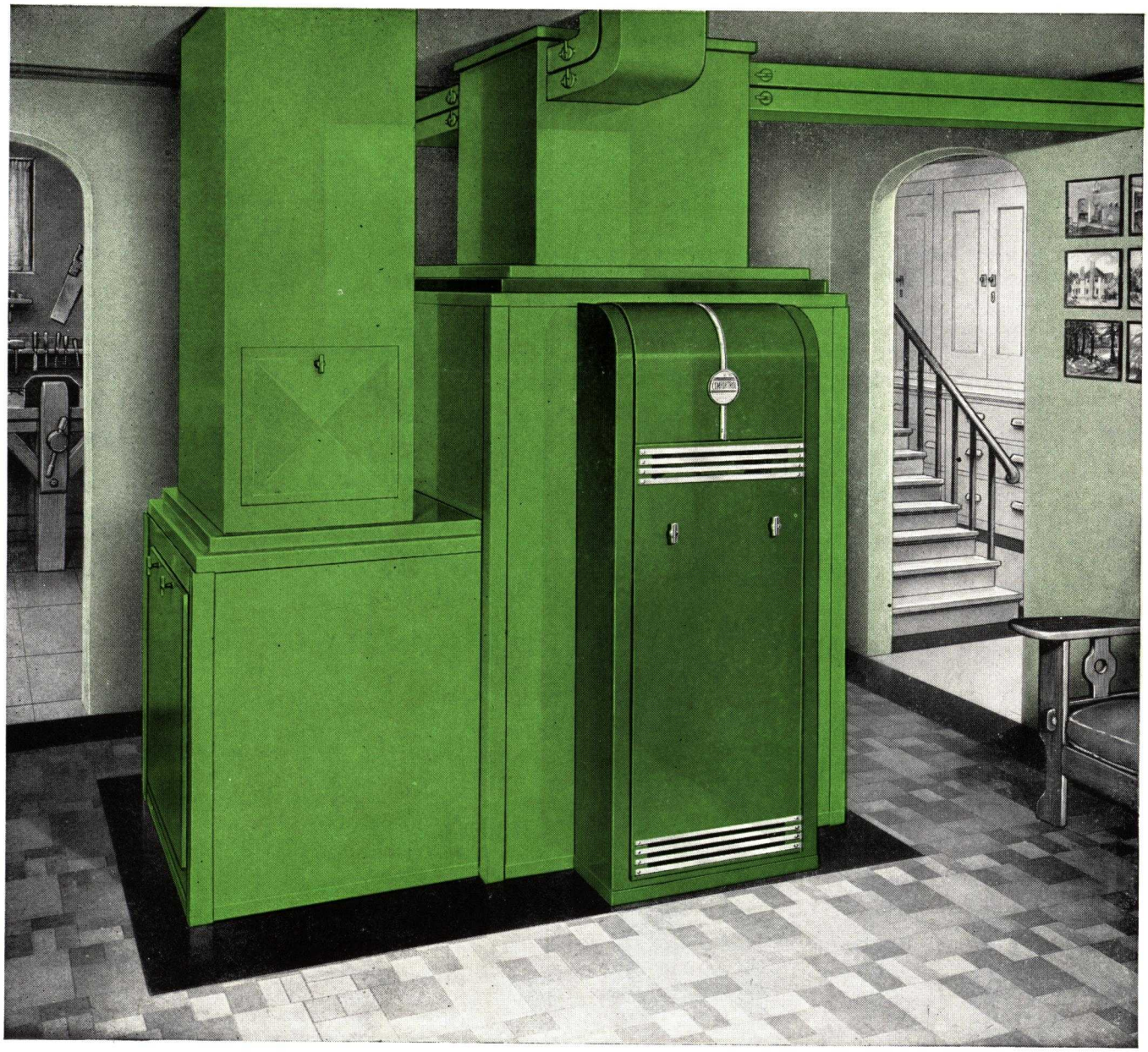
For further particulars, or a consultation, see your local Westinghouse Distributor or write WESTINGHOUSE ELECTRIC & MANUFACTURING CO., Mansfield, Ohio.

THE WATERMAN-WATERBURY COMPANY

1159 Jackson Street, N. E., MINNEAPOLIS, MINN.

WINTER AIR CONDITIONERS

OIL-BURNING **STOKER-FIRED**



WATERBURY COMFORTROL

CONTROLLED WINTER COMFORT FOR THE HOME

The Waterbury COMFORTROL has been thoroughly tested in home-heating and winter air conditioning service under varied conditions and has established remarkable records of efficiency and economy. It is the product of an organization that has specialized in heating since 1907, and has introduced many noteworthy advancements.

Waterbury factory representatives and dealers are conveniently located. They are all trained men who are capable of co-ordinating their experience with your professional knowledge in a way that is helpful to the architect. Their services are available without charge—call your nearest dealer or write for his name and Comfortrol Catalog.

Efficient, Economical Service — Long Life — Specify it with Confidence

COMFORTROL WINTER AIR CONDITIONER

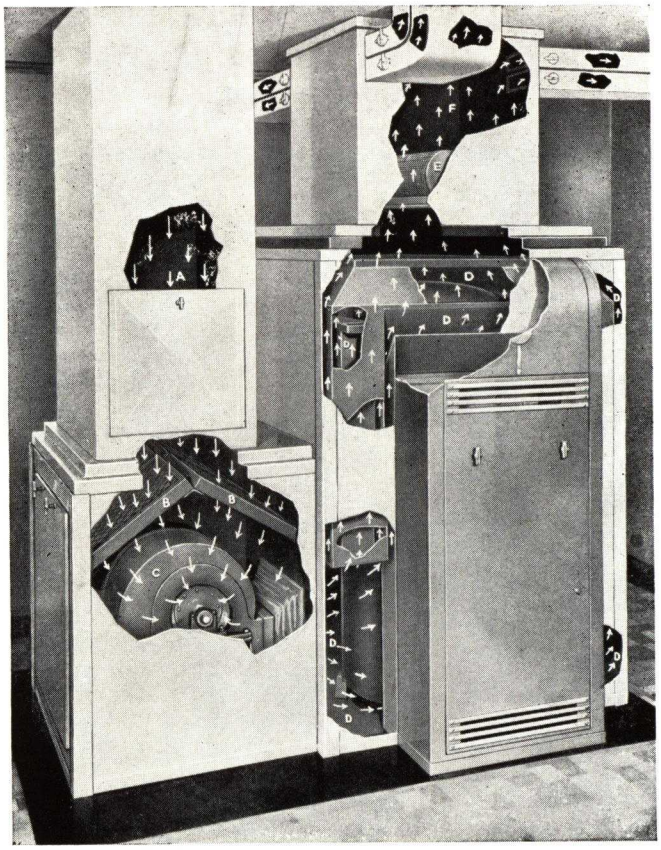
A complete single unit, co-ordinating all the elements essential to efficient, economical heating and correct winter air conditioning in the home.

Only proved standard units are used in the construction of COMFORTROL . . . "Dustop" Air Filters, perfected COMFORTROL Blowers, new-type COMFORTROL Controlled humidifier, and Waterbury permanently gas-tight seamless steel furnace bodies of special design for each type of fuel. Cooling units may be easily added if desired.

The diagram illustration at right shows how the air is drawn from the different rooms down through the return air duct (A)—then through the air filters (B)—then through the blower (C) into and around the extensive heating chambers surrounding the furnace body and radiator (D)—then up through the humidifier (E) into the plenum chamber (F) from which it is circulated through the warm air ducts into the rooms.

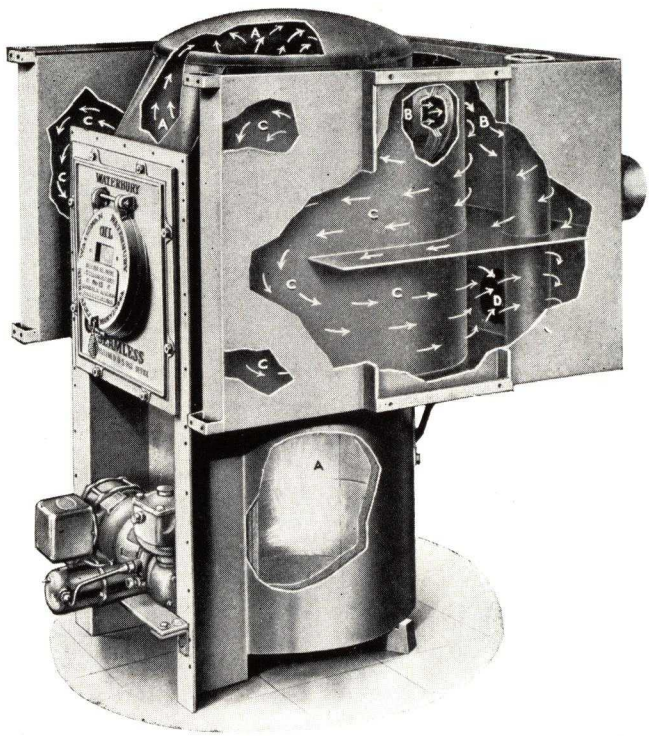
The COMFORTROL *Mixing Orifice,* combined with an adequate plenum chamber above the furnace body, assures equalized pressure and temperature at each of the various air duct outlets.

A Cool Outer Casing—Air circulates between the inner and outer casing, keeping the casing cool and preventing heat waste. The liner is fastened to the furnace body to reduce conduction of heat and is slightly corrugated to minimize expansion and contraction stresses. Above features are incorporated in both the COMFORTROL Oil-O-Matic and COMFORTROL Stoker Air Conditioners.



COMFORTROL OIL-O-MATIC AIR CONDITIONER

For Oil-Burning



Showing travel of combustion gases from combustion chamber (A), through outlet (B) into large radiator (C) where they travel a long circuitous route before passing out into chimney (D)

Clean Heat! An outstanding advantage of this unit is the WATERBURY Seamless Oil-Burning Furnace, specially designed for the most efficient, economical and safe utilization of oil as a fuel. The perfected WATERBURY one-piece welded seamless steel furnace body entirely eliminates the nuisance and danger of smoke, soot, dust, gas and fumes in the home. The head, the bottom, the filler plates and the radiator are all welded. The furnace sets up off the floor to permit circulation of air under the unit, thus even the bottom of the furnace is heating surface.

Large Combustion Chamber is provided—"large enough to permit the correct amount of oil to be burned" as specified by the "Handbook of Domestic Oil Heating" of the American Oil Burner Association.

Extra Large Radiator—engineered to force a long and tortuous fire travel and to utilize the greatest possible amount of heat from the combustion gases. Baffles and air passages have been carefully designed to balance air flow through the radiator and to prevent undue friction in the radiator so that the draft loss between the feed door and smoke outlet is frequently as low as one-half a hundredth of an inch.

The COMFORTROL Furnace Body is sturdily built for long service. The body sides are of 7-gauge steel, and in the larger sizes, heads are of ¼-in. steel. Radiators of all models are made of copper bearing steel.

The world-famous Williams Oil-O-Matic Oil Burner is standard equipment on COMFORTROL OIL-O-MATIC. Also available less burner for use with any good oil burner.

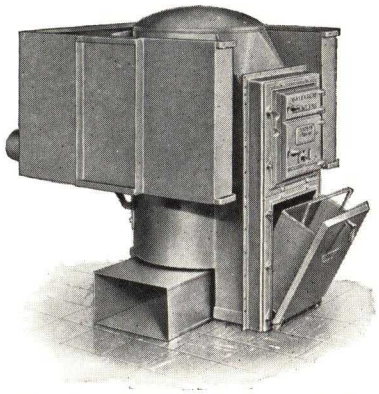
COMFORTROL STOKER AIR CONDITIONER

This unit is specially engineered for use with any standard coal stoker and introduces important improvements in furnace design for stoker operation. It is correctly co-ordinated with complete, efficient and healthful winter air conditioning for homes.

Stoker mounted under furnace body . . . to the rear, or at either side of furnace. Note *airtight casing* for stoker mechanism.

Radiator with long fire travel assures greatest heating efficiency and fuel economy. Vertical baffle plates are so designed that accumulation of fly ash does not interfere with fire travel. Handy clean out openings in back of radiator.

Clinker Receptacle—located just inside and under the front door. The hot clinkers are dropped into this portable container, allowing gases to pass out through smoke pipe while cooling. At convenient times, the container of cooled clinkers can be easily lifted out through the lower door. This exclusive WATERBURY feature does away with the need for handling the hot clinkers and eliminates smoke, fumes and dirt in the basement. Large double door provides easy access to fire.



Showing Stoker Furnace Body, Large Radiator and removable Clinker Receptacle

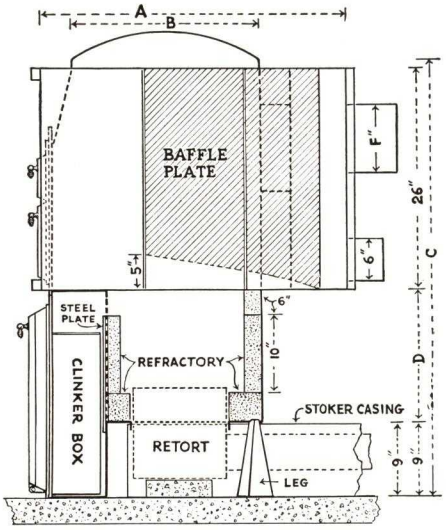


Diagram of Stoker Furnace Body
Follow table below for Dimensions

Size furnace	A	B	C	D	F
320	42″	24″	50″	14″	8″
325	46″	27″	50″	14″	9″
330	50″	30″	56″	20″	9″

COMFORTROL OIL-O-MATIC AIR CONDITIONER—STANDARD EQUIPMENT

Oil-O-Matic Oil Burner
Minneapolis-Honeywell Controls
Seamless Oil Furnace, radiator
COMFORTROL Blower with motor
Cole Draft Governor
COMFORTROL Humidifier
"DUSTOP" Filters
Enameled Casing, 2-tone green

COMFORTROL OIL-O-MATIC AIR CONDITIONER—SIZES AND SPECIFICATIONS

Size	Capacity, gal. oil per hour	B.t.u. per hour capacity at register	Width, not including bnr. hood, in.	Width burner hood, in.	Length over all, in.	Height over all, in.	Blower size	Motor hp.*	Total resist. through unit at max. rating	Size return air connection, in.	Size W.A. outlet, in.	Filters		Approx. shipping weight, lbs.
												Number	Size each, in.	
215-12	1½	142,763	44	10	74	64½	12	¼	.045	19¾x34¼	27½x27½	4	16x20	1500
215-15	1½	142,763	44	10	74	64½	15	⅓	.045	19¾x34¼	27½x27½	4	16x20	1560
220-15	2	190,350	48	10	81	64½	15	⅓	.065	26 x38¼	31½x31½	4	16x20	1660
220-18	2	190,350	48	10	81	64½	18	½	.065	26 x38¼	31½x31½	4	16x20	1780
225-18	2½	237,938	52	10	85	64½	18	½	.077	27½x42	35½x35½	4	2–16x20 2–16x25	1960
225-21	2½	237,938	52	10	90	64½	21	¾	.077	31¾x42	35½x35½	4	2–16x20 2–16x25	2140
230-21	3	285,525	56	10	94	70½	21	¾	.09	31¾x46	39½x39½	4	16x25	2300

*Standard Blower Motor Specifications—Size 215-12, 110 V. a-c. All other sizes, 110 V. or 220 V. a-c.

COMFORTROL STOKER AIR CONDITIONER—STANDARD EQUIPMENT

Seamless Stoker Furnace with radiator and removable Clinker Receptacle
Fire brick for fire pot
Stoker casing under furnace
COMFORTROL Humidifier
"DUSTOP" Filters
COMFORTROL Blower with motor
Enameled Casing, 2-tone green

COMFORTROL STOKER AIR CONDITIONER—SIZES AND SPECIFICATIONS

Size	Max. fuel consumpt. recomnd. per hour	B.t.u. per hour max. capacity at register	Width, less hood, in.	Length over all, in.	Height over all, in.	Blower size	Motor hp.	Resistance (S.P.) at maximum rated c.f.m.	Size return air connection, in.	Size WA outlet in.	Filters	
											Number	Size each, in.
320-12	20	161,000	48	81	65	12	¼	.065	26 x38¼	31½x31½	4	16x20
320-15	20	161,000	48	81	65	15	⅓	.065	26 x38¼	31½x31½	4	16x20
325-18	30	242,000	52	85	65	18	½	.077	27½x42	35½x35½	4	2–16x20 2–16x25
325-21	30	242,000	52	90	65	21	¾	.077	31¾x42	35½x35½	4	2–16x20 2–16x25
330-21	40	322,000	56	94	71	21	¾	.09	31¾x46	39½x39½	4	16x25

COMFORTROL BLOWER RATINGS

Blower size	Motor hp.	Wheel diameter, in.	Standard motor pulley r.p.m. range	Special motor pulley r.p.m. range	C.f.m. range using required pulley	R.p.m. range required to attain minimum to maximum c.f.m. rating at statics as listed below:			
						⅛″ (.125 SP)	¼″ (.25 SP)	⅜″ (.375 SP)	½″ (.50 SP)
12	¼	13	367 to 507	507 to 682	645 to 1677	294 to 450	427 to 507	530 to 562	610 to 617
15	⅓	14⅝	306 to 423	423 to 568	922 to 2397	249 to 379	365 to 435	453 to 483	524 to 528
18	½	17⅞	306 to 423	423 to 568	1232 to 3204	214 to 327	311 to 368	385 to 408	443 to 449
21	¾	19½	262 to 362	362 to 488	1450 to 3770	196 to 300	285 to 338	353 to 374	407 to 412

Note: Standard motor pulley 2.1 to 2.9. Special motor pulley 3.1 to 3.9. For detailed capacity ratings, required brake horsepower and revolutions per minute, see COMFORTROL Blower Folder.

WILLIAMS OIL-O-MATIC HEATING CORPORATION

Manufacturers of Air Conditioning Equipment

BLOOMINGTON, ILL.

SERVICE TO ARCHITECTS AND BUILDERS

CHICAGO, ILL., 641 No. Michigan Avenue NEW YORK, N. Y., 1231 Graybar Building

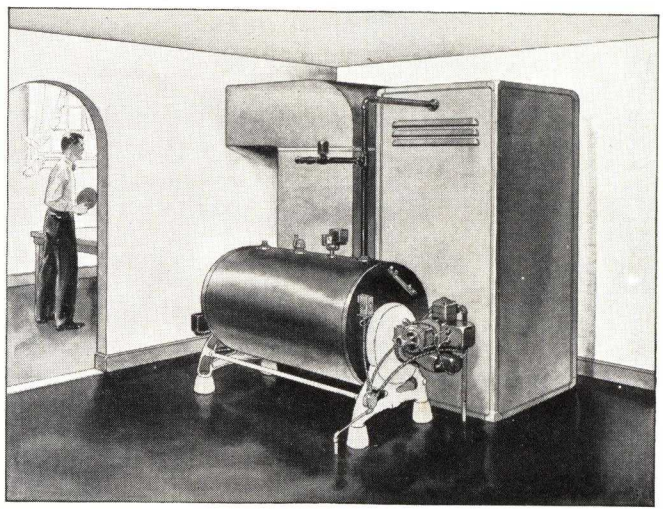
For Williams Oil-O-Matic Oil Burner Equipment and Ice-O-Matic Refrigeration Equipment, see File Index

WILLIAMS AIR-O-MATIC CONDITIONING

Air-O-Matic Combines Heating and Cooling in One Air Conditioning System

The Williams Oil-O-Matic Heating Corporation has developed an outstanding year 'round air conditioning system known as "Air-O-Matic." Low pressure steam, which is usually provided by an Oil-O-Matic operated boiler unit, is supplied directly to a copper finned heating coil within the central air distributing unit for heating service, which can be supplemented by direct radiation if desired. Proper provision for the addition of moisture is provided for winter heating service.

This same low pressure steam, through an especially developed absorption refrigeration unit, provides the proper degree of temperature and humidity reduction for summer comfort. A change from winter to summer operation can be effected almost instantaneously by means of a master control located in a suitable, convenient place.



The Williams Low Pressure Steam Absorption Type Unit, the outstanding feature of Air-O-Matic, has been especially developed to meet the particular requirements of air conditioning through years of research in the Williams' Laboratories. It affords adequate comfort cooling facilities with unusual advantages of economical operation, mechanical simplicity, compactness and freedom from fire and toxicity hazards. Both the solvent and refrigerant are newly developed chemicals and are essentially non-toxic, non-inflammable, non-corrosive to the common metals and chemically stable under all operating conditions.

The Air-O-Matic Absorption Unit is designed to operate on a steam pressure of 10 to 13 pounds. Other steam pressures may be used, but the capacity will vary with the steam pressure, although the thermal efficiency remains practically constant. The heat input required is 24,225 B.t.u.'s per hour per ton under ordinary operating conditions.

The only electrical requirement of the absorption refrigeration unit is that of the motor-driven circulating pump for pumping the solution through the heat exchanger into the heater.

The low power requirements make possible the use of single-phase current in the smaller size installation, thereby saving the expense of providing 3-phase current.

For all sizes of machines any low pressure steam boiler of the proper capacity may serve to generate the required steam.

Except where winters are very mild, the steam required for heating, in the average installation, is greater than that required for cooling. Consequently, no additional boiler capacity is required for the operation of the absorption unit.

Note — *A Williams Oil-O-Matic Boiler Burner Unit or other types of automatic heating systems may be used to maintain the necessary steam pressure automatically.*

The only metal to metal contact of moving parts within the refrigeration unit is between the seal face and seal seat of the solution circulating pump. This seal face operates in a bath of oil, thereby assuring proper lubrication.

These new absorption refrigeration units are offered in both evaporative cooling type of unit and water circulating type of unit. The former is available in 2½, 5, 7½, 10 and 20-ton capacities. The water circulating type is of 20-ton capacity.

Several types of control systems are offered which provide for automatic maintenance of the desired temperature, humidity, and ventilation.

Air-O-Matic may be equipped with either the "cleanable" or "throw-away" type of filters.

Gar Wood

AUTOMATIC HEATING and AIR CONDITIONING

A COMPLETE LINE OF EQUIPMENT

Gar Wood

GAR WOOD INDUSTRIES, INC.

AIR CONDITIONING DIVISION

Manufacturers of Oil Burners, Oil-fired Air Conditioning Systems and Boiler Burners, Oil-fired Water Heaters and Gas-fired Air Conditioning Systems

General Offices

7924 RIOPELLE ST., DETROIT, MICH.

● **EXPERIENCE**—The Air Conditioning Division of Gar Wood Industries, Inc., is part of a huge industrial organization, with factories in Detroit, San Francisco and Windsor, Ontario, and with factory branches and distributors in principal cities.

All products of the Air Conditioning Division are designed by Gar Wood engineers and built in the Gar Wood factories.

Eight years ago, Gar Wood Industries introduced a revolutionary type of boiler-burner unit—the first in which boiler and oilburner were matched, the boiler being designed for quick-burning oil fuel, instead of for slow-burning fuels.

GAR WOOD, PRESIDENT

A next step was the introduction of the Tempered-Aire air conditioning system—a direct system employing the warm air principle, but with reversed heat travel and a patented Economizer having a tremendous heating area. This system set new standards in heating economy and presented new and simplified methods of filtering, humidifying and ventilating.

Gar Wood then began to manufacture conversion oil burners. From the very beginning they were conspicuous for their economy because they successfully and completely burned the low-grade fuel oils, which are highest in heat units and lowest in cost.

Two years ago Gar Wood engineers developed "Air-Dux," a simplified duct system consisting of a series of welded parts, designed to standard building measurements and practice, which eliminate the need for "tailor made" trunk lines. This duct system is a great benefit to architects and builders alike.

Another addition to the Gar Wood line was a gas-fired Tempered-Aire, which applies the same heat-extracting principles to gas, as the standard Tempered-Aire does to oil.

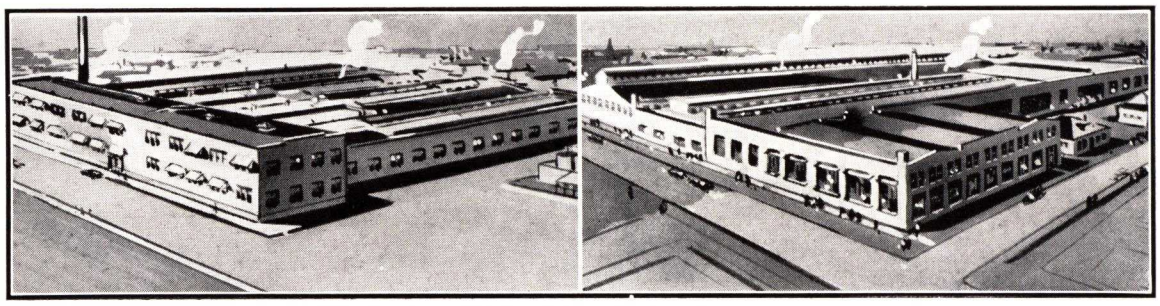
To complete the line there is a commercial oil burning water heater, fully automatic, economical and trouble-free; a domestic oil burning water heater of the storage type and one of the coil type with separate storage tank; and a line of ventilating fans for residential and commercial use.

● **MANUFACTURING FACILITIES**—Gar Wood Oil and Gas Burning and Air Conditioning Equipment, except for certain accessories such as motors and automatic electrical control units, is entirely made in its own modernly equipped and rigidly supervised plant at Detroit, Mich.

● **DISTRIBUTION**—Sales and installations are handled nationally in all principal cities through branches and licensed distributors.

● **RESPONSIBILITY**—Gar Wood Products are backed by a sound financial organization—a company which has not only weathered the storms of the recent years of depression, but has improved its commercial position during that period.

● **ENGINEERING SERVICES**—Gar Wood Distributors are all experienced oil heating and air conditioning engineers whose advice and assistance may be relied upon. A corps of competent consulting engineers is maintained at each factory branch for the convenience of the architect in adapting the broad line of Gar Wood Oil and Gas Heating Units and Air Conditioning Equipment to unusual installations, and the economical solution of oil and gas heating and air conditioning problems.



DETROIT PLANTS OF GAR WOOD INDUSTRIES, INC.

Gar Wood

GENERAL TYPES OF EQUIPMENT

● **TEMPERED-AIRE-FURNACE, BURNER, HUMIDIFIER, FILTER, BLOWER**—An enclosed, compact, balanced warm air heating unit in five (5) capacities consisting of a steel down-draft furnace designed integrally with its automatic oil burner, humidifier, filters, and blower fan. **See pages 4 and 5.**

● **TEMPERED-AIRE GAS FIRED UNIT**—A fully enclosed, complete air conditioning system, in two (2) sizes, with furnace designed especially for gas fuel. Corrugated walls more than double heating surface. Made of copper-bearing steel, welded gas tight. Filters, humidifies, warms, ventilates. **See page 6.**

● **MODEL "R" BOILER-BURNER UNIT**—An economical, fully enclosed, balanced unit for steam or hot water heating in five (5) sizes. The automatic oil burner is integrally designed with the double-pass horizontal, firetube, welded steel boiler. For complete detailed description, **see pages 7 and 8.**

● **INDIRECT AIR CONDITIONING CABINET**—A compact, indirect air conditioning cabinet, in eight (8) sizes, consisting of air filter, blower, humidifier, and blast heater for use with the Boiler-Burner Units for either full indirect conditioned air heating or with a split system. **See pages 8 and 9.**

● **CONVERSION OIL BURNER UNITS**—Highly efficient automatic oil burners for installation in existing heating plants. Designed in a complete range of sizes to meet all domestic requirements. **See page 10.**

● **COMMERCIAL OIL FIRED WATER HEATER**—A commercial water heater, in two (2) sizes, (used singly or in multiple) adapted to the large building field—Hotels, Hospitals, Clubs, Commercial Buildings, etc. Operation cost is surprisingly lower than with hitherto existing equipment. **See page 11.**

● **DOMESTIC OIL FIRED WATER HEATER**—A domestic water heater, in two types. (1) Storage type heater, in which the oil burner and flue are built into a 40-gallon storage tank. (2) Coil type heater used with separate storage tank. **See page 12.**

● **VENTILATOR FAN**—A complete motor driven ventilator fan in eight (8) sizes which is suspended on coil springs from the ceiling or rafters and used to cool the whole house by expelling heated air from the attic at sundown. Has many commercial applications as a ventilator. **See page 13.**

● **MODEL "EW" FURNACE, BURNER, HUMIDIFIER, FILTER, BLOWER**—A low priced winter air conditioning unit for small homes. Grille delivery, 80,000 B.T.U. per hour. **See page 14.**

CHARACTERISTICS OF OIL BURNERS

● **TYPE—OIL BURNED**—Gar Wood Oil Burners are of the pressure atomization type. All units are listed by the Underwriters' Laboratories to burn No. 3 oil or lighter.

● **BURNER ASSEMBLY**

Oil Filter—An advanced design filtering device connected in the oil supply line to the oil pump. Removes dirt and foreign material in the fuel oil.

Oil Pump—A quiet, self-lubricating gear pump. Single stage pump supplied as standard for inside oil tank installations. Two-stage pump available for outside oil storage tank installations. No auxiliary pumps required.

Pressure Regulator—Provides a definite oil pressure at the jet (adjustable between 90 and 150 lbs. per sq. in.) and a quick jet cut-off immediately below the operating point. Accessible for adjustment, it is connected between the oil pump and the oil tube supply to the oil jet.

Oil Tube and Nozzle—The oil tube, fitted with a removable oil strainer, terminates in the oil atomizing jet or nozzle which breaks up the oil under pressure (approximately 100 lbs.) into a fine mist and sprays it in the shape of a cone.

Air Blower-Fan—A noiseless multiblade Blower-Fan furnishes air through adjustable air ports for combustion of the oil. The air is driven through the air tube and out around the air cone. It is ejected from the air tube in the shape of a cone and meets the cone of oil mist at a fixed angle. This compels an intimate mixture of oil and air necessary for proper combustion.

Motor—The enclosed, horizontal motor drives both the blower fan and the oil pump.

Ignition System—A positive electric ignition system. The ignition spark is furnished by a step-up transformer with a 12,000-volt secondary.

● **CONTROLS**—The control units vary to suit the particular type of installation, electric current, etc.

Thermostat—A sensitive room thermostat, adjusted to a small temperature differential, starts and stops the cycle of burner operation to maintain a uniform temperature.

Aquastat—Operating control on hot water system. On steam system acts as a boiler water temperature limiting control to provide domestic hot water during times when the thermostat does not call for heat. Usually set at 180 degrees.

Protectorelay—Instrument controlled by low-voltage thermostat or aquastat (or both) to control operation of the oil burner. Automatically cuts in and out electric current supply for ignition transformer and burner motor. Also includes safety device to shut down oil burner in case of combustion failure.

Low Water Cut-Out—Installed on steam boiler. Cuts the main current supply to the burner should the boiler water level become so low as to uncover heating surfaces.

Combination Furnace Control—Operating blower control and high limit furnace control. Allows furnace to come up to correct temperature before blower comes on, thereby preventing supplying cold air to rooms. Also burner high limit control to prevent overheating in case of blower failure.

Humidistat—A sensitive room humidistat actuated by moisture in the air to regulate flow of water to the humidifier.

● **OPERATION**—The motor-driven oil pump, the blower fan, and ignition system actuated by the thermostat, start simultaneously. The combustible gas at the burner nozzle is immediately ignited. The burner operates until the room temperature rise causes the thermostat to stop the burner cycle.

● **QUIET**—The burner assembly is sturdy and vibrationless. In operation it is practically noiseless.

● **EFFICIENCY**—Tests and actual field experience show maximum heat generated on a minimum oil consumption.

● **UNDERWRITERS' APPROVAL**—All Gar Wood Oil Burners are listed and labeled as "Standard" by the National Board of Fire Underwriters.

Gar Wood

TEMPERED-AIRE UNIT

The Tempered-Aire heating and air-conditioning equipment made in five (5) capacities, consists of filters, blower, burner, humidifier, and oil furnace engineered into one compact, co-ordinated system.

In winter cleaned, humidified, warmed air is delivered from the unit to the duct system and then uniformly distributed to all parts of the building. In summer the unit circulates cool, filtered air.

Air is cleaned by dry cloth filters and circulated by a multiple-blade blower fan. The heating unit is a down-draft, warm-air furnace equipped with an integral oil burner. The humidifier, located at the top of the unit, is designed integrally with the furnace.

● **THE FURNACE**—The furnace is constructed of heavy steel, electrically welded. While the heating unit is small and compact in appearance, it contains a heating surface three times larger than that of the ordinary warm-air furnace.

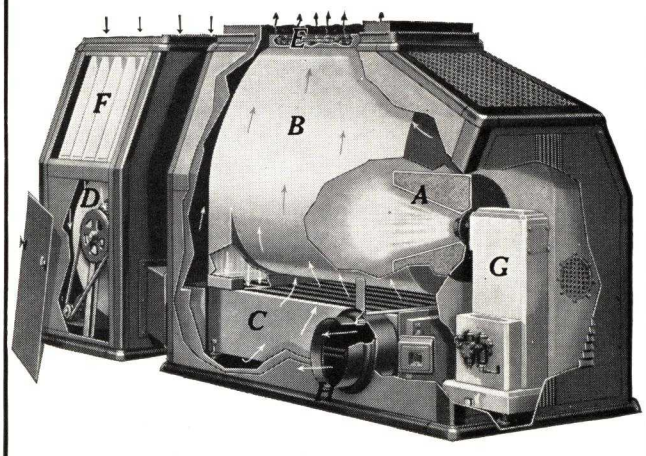
The large size of the firebox decreases the rate of heat transfer, increasing the life of the unit by eliminating the wear and strain caused by high temperature operation. Rooms receive mild, mellow warm air heat instead of the usual blast of hot, parched air.

Below the firebox is that important, exclusive Gar Wood feature—the economizer—by means of which heat normally wasted in the furnace is conserved and utilized. This consists of a series of flat, thin flues, separated by thin air spaces, through which the hot gases pass before entering the smoke pipe. These economizer flues expose an enormous amount of heating surface in a very compact space, resulting in greatly lowered operating costs. Cool incoming air, passing through the interstices between the flues and wiping their outer surfaces, is pre-heated as the first step.

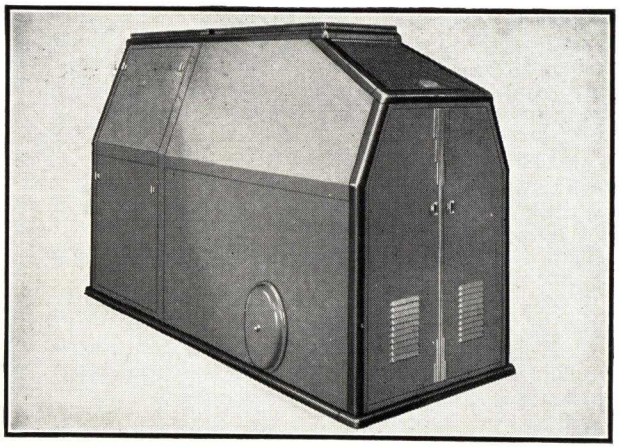
The second step is the final heating by contact with the firebox. In other words, we have a "counterflow" or reversed transfer of heat. The economizer is placed in contact with the cool air discharged by the blower, making for maximum difference in temperature between gas and air and consequent maximum extraction of heat.

Above the firebox is located the humidifying pan which automatically maintains the proper degree of healthful moisture.

● **THE BURNER**—The burner, Gar Wood pressure atomizing type, is designed as an integral part of the furnace.



A—Firebowl B—Firebox C—Economizer
D—Blower E—Humidifier F—Filters
G—Oil Burner H—Stack



The smallest size, Model 102, is built all in one cabinet

The mixture of oil and air is fired into a refractory bowl which acts as a combustion chamber. A clean, quiet flame discharges from this bowl in the center of the giant firebox, which acts as a "plenum chamber." The result is a soft, "soaking" transfer of heat rather than a sharp cutting action, where flame is allowed to impinge on a heating surface. For full description, characteristics, and safety controls, see page 3.

● **EFFICIENCY**—Nearly ninety per cent (90%) of the heat generated is absorbed. Stack temperatures (approximately 275 degrees) are just high enough to prevent condensation.

● **AIR FILTER AND BLOWER**—Compactly and efficiently designed, the air filtering and blower unit is an integral part of the plant.

The bag filters, located below the return air connection, thoroughly clean and strain the air as it passes through them into the blower fan. The dry cloth filter bags are easily removed and can be cleaned by washing. The blower unit is mounted on four flexible rubber feet, and the blower is connected to the economizer inlet by a flexible canvas connection which gives absolutely quiet operation. All blowers are provided with adjustable speed pulleys which are easily set to give the exact air delivery required.

The clean air is blown into the economizer, then up around the firebox past the humidifier. Thus warmed and humidified it is driven through the supply ducts to the rooms. A room humidistat automatically controls the delivery of water to the humidifier.

● **ENTIRELY ENCLOSED**—The furnace-burner unit is entirely enclosed in an attractive, lacquered steel casing. The front of the unit opens to give convenient access to the burner, which is out of sight and away from dust accumulation and possible tampering. Models 103, 104, 105 and 105C are built with air filter and blower cabinet separate from the furnace-burner unit. Because of the smaller sizes of the Model 102, and 102-A, they are built all in one cabinet.

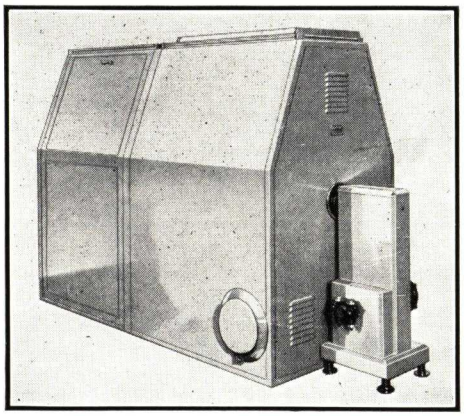
● **SUMMER COOLING**—Without the usual initial expense and the expense of operation involved in the installation of a cooling plant, comfortable summer temperatures may be maintained by merely circulating the air. The night temperature of the outside air averages 20 degrees cooler than day temperature. At night, the cooler outside air is drawn through the blower cabinet and circulated through the rooms. During the daytime, the cooler basement air is drawn through the blower cabinet and circulated through the rooms, maintaining the lower temperature. The constant, draftless, complete air circulation through all the rooms is, in itself, highly beneficial.

LOWER PRICED TEMPERED-AIRE MODEL 102-A

The Model 102-A is very similar in design and construction to the regular Model 102 except for a few minor changes. These do not affect the mechanism or the performance in any way, but result in a substantial saving in cost which is passed on to the home owner.

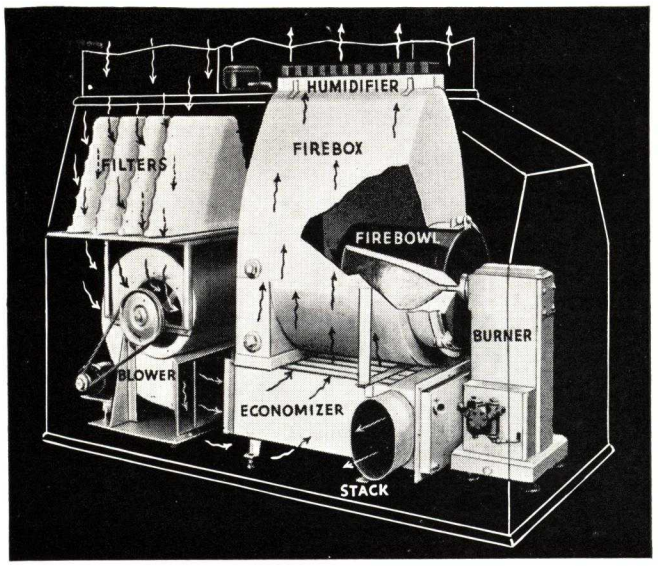
The filter is a one piece cloth sack stretched over a large wire rack rather than the four filters which are used in the standard model Tempered-Aire. The exterior case does not cover the oil burner unit which is enclosed in a pressed steel casing that keeps it free from dust.

It is especially designed for the "average sized" home where economy is essential in both original cost and upkeep.

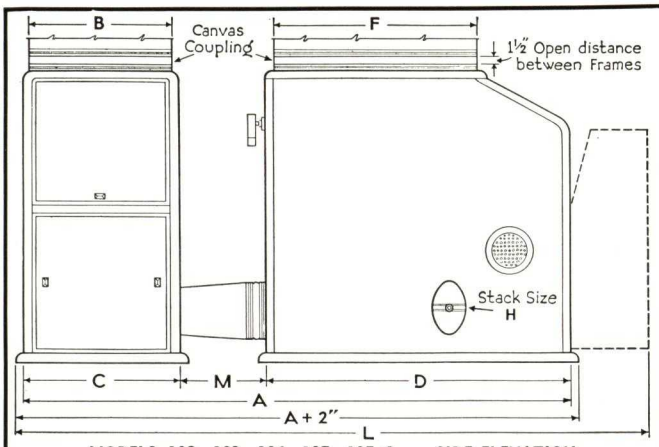


MODEL 102-A—The Burner Is Outside the Cabinet

THE TEMPERED-AIRE CHASSIS

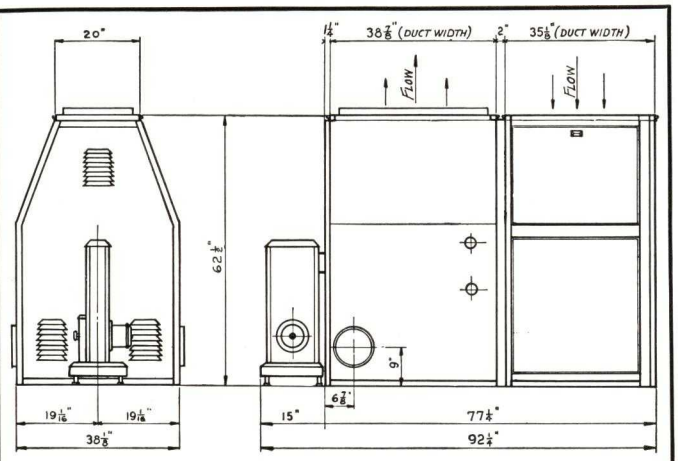


CONVENIENT REFERENCE TABLE FOR ARCHITECTS AND CONTRACTORS

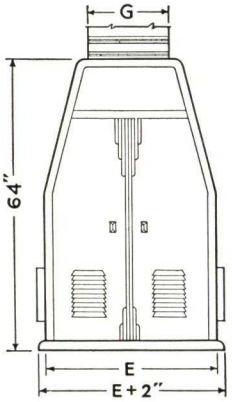


MODELS 102, 103, 104, 105, 105-C SIDE ELEVATION

NOTE: Dimension M is zero in Model 102 as this unit is built in a single cabinet.



MODEL 102-A



FRONT ELEVATION

CAPACITIES AND DIMENSIONS	No. 102	No. 102-A	No. 103	No. 104	No. 105	No. 105-C
B.t.u. 1 hr. at Bonnet	120,000	120,000	165,000	225,000	300,000	400,000
B.t.u. 1 hr. at Grilles	100,000	100,000	135,000	185,000	245,000	.....
Air Delivery, C.F.M.	1000-1575	1000-1575	1375-2150	1875-2950	2500-3925	3000-4500
Air Temperature at Bonnet	175°-135°	175°-135°	175°-135°	175°-135°	175°-135°	185°-145°
Oil Rate, Gallons 1 hr.	1.20	1.20	1.65	2.25	3.00	4.00
Heating Surface, Firebox, Sq. Ft.	30	30	33	44	55	55
Heating Surface, Economizer, Sq. Ft.	60	60	99	132	165	165
Heating Surface, Total, Sq. Ft.	90	90	132	176	220	220
Crated Weight, Lbs.	2000	2,000	2200	2550	2900	2925
Dimension A	94 9/16"	For these Dimensions see Drawing on 102-A above	115 13/16"	138¼"	154¼"	154¼"
Dimension B (Inside Frame)	35 11/16"		32 3/16"	36 5/16"	45 7/16"	45 7/16"
Dimension C	38"		34¼"	38¼"	47½"	47½"
Dimension D	56 9/16"		63"	75"	87"	87"
Dimension E	38¼"		38"	38"	38"	38"
Dimension F (Inside Frame)	35¾"		42⅜"	54⅜"	66⅜"	66⅜"
Dimension G (Inside Frame)	18 9/16"		17 1/16"	17 1/16"	17 1/16"	17 1/16"
Dimension H	10"		10"	10"	10"	2-10"
Dimension L	112 1/16"		133 5/16"	155¾"	171¾"	171¾"
Dimension M	0"		18 9/16"	25"	19¾"	19¾"
Filter Area, Sq. Ft.	34	24	43	60	77	77
Chimney Dimensions (Flue Lined)	8"x12"x30'	8"x12"x30'	8"x12"x30'	12"x12"x35'	12"x12"x35'	12"x16"x40'
Minimum Width Door to Admit Unit.	29"	29"	29"	29"	29"	29"

NOTE: Drawing above is for all models. Dimension M is zero in Model 102 as this unit is built in a single cabinet.

Gar Wood

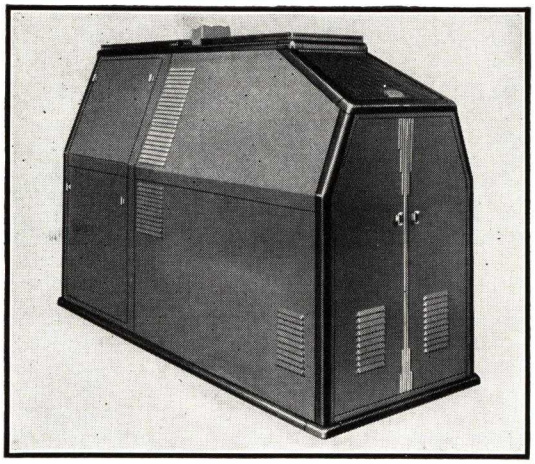
GAS-FIRED TEMPERED-AIRE

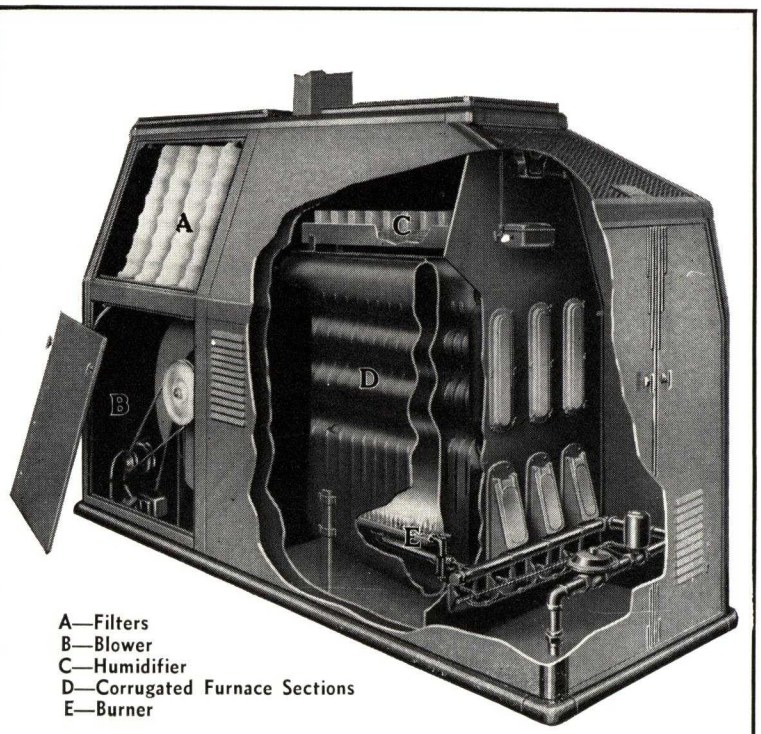
Tempered-Aire is also available for gas. This complete unit is designed for those localities where gas rates are sufficiently low to make gas heating an economy. Built in a single, compact unit, the gas-fired Tempered-Aire accomplishes the various functions of air conditioning in the most efficient manner.

Heating is automatic, clean, odorless and inexpensive. The gas valve is operated by a thermostat in one of the living rooms, supplying heat as necessary to maintain whatever temperature you select.

Made of heavy-gauge, copper-bearing steel and welded into a single gas-tight unit, this furnace is designed to give the maximum heat transfer. The corrugations and ribbings give a heating area more than double that of a flat surface of equal outside dimensions. The air from the blower impinges against the walls with considerable velocity and searches out every inch of heating surface. Heat is delivered immediately.

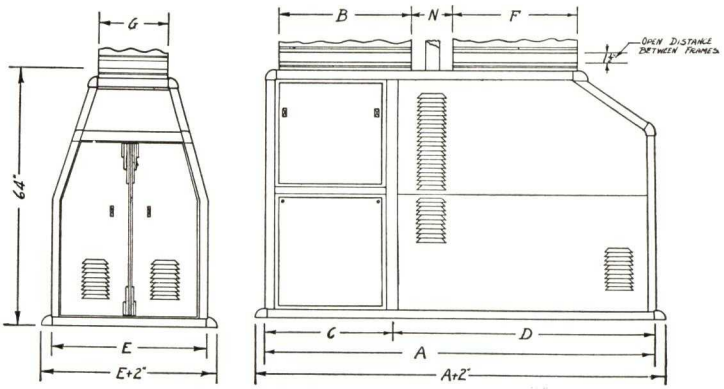
FILTERING, VENTILATING, HUMIDIFYING AND BLOWER COOLING IN SUMMER, functions of the gas-fired unit are identical with the oil-fired Tempered-Aire systems. (See page 4.)





A—Filters
B—Blower
C—Humidifier
D—Corrugated Furnace Sections
E—Burner

CAPACITIES AND DIMENSIONS	MODEL 120	MODEL 90
AGA Input, B.T.U. per hr.	180,000	135,000
AGA Output, B.T.U. per hr.	135,000	100,000
Grille Delivery, B.T.U. per hr.	120,000	90,000
Air Delivery, C.F.M.	1200-1900	900-1400
Air Temp. at Bonnet	175°-135°	175°-135°
Filter surface	34 sq. ft.	34 sq. ft.
Blower size	14"x14"	14"x14"
Blower Motor size	¼ H.P.	¼ H.P.
Blower Motor current consumption	250 Watts	250 Watts
Gas Connection	1¼"	1¼"
Flue Size	10"x4"	10"x4"
Dimension A	94-9/16"	94-9/16"
Dimension B	33-3/16"	33-3/16"
Dimension C	38"	38"
Dimension D	56-9/16"	56-9/16"
Dimension E	38"	38"
Dimension F	30-1/16"	30-1/16"
Dimension G	18½"	18½"
Dimension N	11"	11"



MODEL "R" BOILER-BURNER UNIT

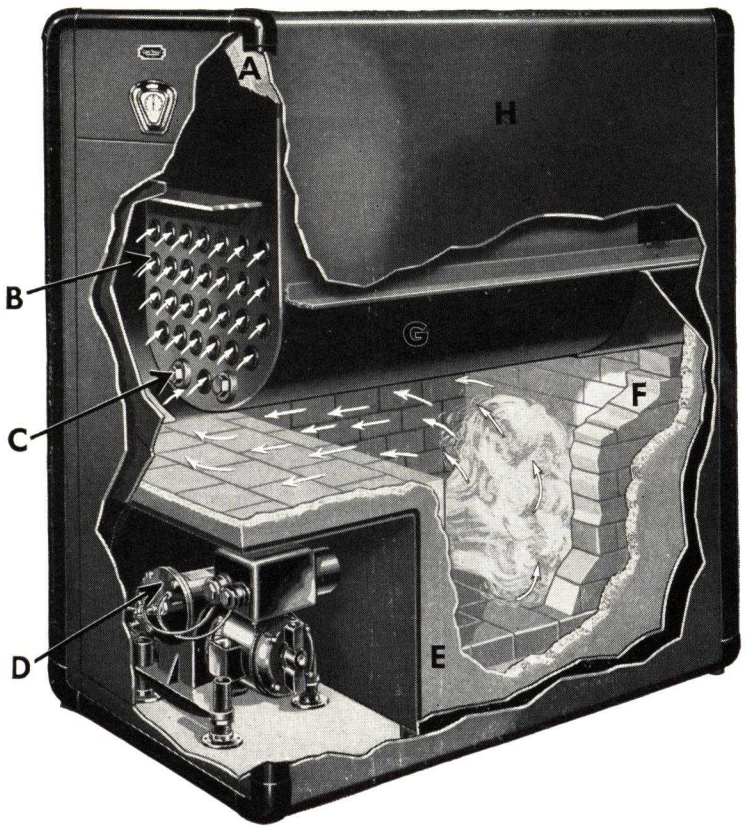
The Gar Wood Model "R" Boiler-Burner Unit, in five (5) sizes, is a compact, steel, fire-tubular steam or hot water heating boiler with an integrally designed oil burner, all precisely engineered to extract maximum heat from low cost (No. 3) domestic fuel oil.

For indirect air conditioning equipment for use with these Boiler-Burner units, see page 9.

● **THE BOILER**—The Gar Wood Model "R" is a midget power boiler. It might be described as a portable horizontal return tubular type. Instead of having water legs, its combustion chamber walls are carried clear to the shell or crown sheet. These walls are backed up by high temperature insulation. The result is a considerably higher temperature of fire than is found in the conventional heating boiler. The absence of water legs is offset by the fact that the higher temperature combustion chamber walls radiate a corresponding greater amount of heat which is absorbed by the shell. This higher temperature fire improves the combustion of No. 3 oil in the smaller quantities. It also results in a maintaining of combustion chamber temperature during the shut-down intervals of the intermittent-type burner. It is diametrically opposite to the system being proposed by some makers of water cooling the walls of small boilers.

Since there are no water legs, the bulk of the heating surface is concentrated in the firetubes or secondary heating surface. This results in a greater extraction of heat from the hot gas leaving the firebox and consequent lower stack temperatures, higher efficiency, and operating economy.

Simplicity of design is stressed throughout. The boiler tubes which are rolled into the tube sheet are accessible for inspection by the removal of the flue door immediately back of the front access doors. All units are equipped with high grade boiler trimmings, such as pressure gauge, water glass with water cocks, pop valve, etc., for steam or vapor plants, and altitude-temperature gauge for hot water plants.



A—Jacket Insulation
B—Boiler Tubes
C—Cleanout Plugs
D—Pressure Atomizing Burner
E—Firebox Insulation
F—Refractory Brick
G—Boiler Shell
H—Lacquered Steel Jacket

● **THE BURNER**—The Gar Wood pressure atomizing burner, located at the front bottom, is co-ordinated with the boiler to produce maximum efficiency. See page 3 for complete description of burner assembly and automatic temperature and safety controls.

● **EFFICIENCY**—Due to the perfected design, virtually all the heat is extracted resulting in unmatched fuel economy.

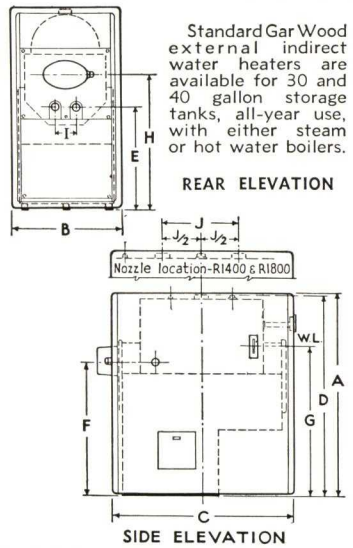
● **ENTIRELY ENCLOSED**—The Model "R" Boiler-Burner Unit is entirely enclosed in at attractive, well finished, lacquered steel jacket.

● **DOMESTIC HOT WATER SUPPLY**—Year-round a constant, generous supply of hot water is available. This modern convenience is accomplished by installing a Gar Wood external indirect water heater below the boiler water line. In summer, the boiler water temperature is thermostatically maintained at 180 degrees—warm enough to produce hot water in abundance but controlled so no heat is delivered to the building. For ratings and dimensions see page 8.

Gar Wood

RATINGS AND DIMENSIONS—BOILER-BURNER UNITS

MODEL "R"	R475	R750	R1000	R1400	R1800
Burner model	H	H	D	D	D
Firing rate—gal. per hr.	1.65	2.50	3.25	4.50	6.00
Max. net steam load—sq. ft.	475	750	1000	1400	1800
Max. net hot water load—sq. ft.	760	1200	1600	2240	2880
Max. gross steam load—sq. ft.	712	1125	1500	2100	2700
Max. gross hot water load—sq. ft.	1140	1800	2400	3360	4320
Heating surface—sq. ft.	52	68	84	118	154
Size steam nozzle	3"	4"	4"	2-4"	2-4"
Size return connections	2-2"	2-2½"	2-2½"	2-2½"	2-3"
A—Overall height—jacket	58¼	58¼	68⅝	68⅝	68⅝
B—Overall width—jacket	30 3/16	30 3/16	37 13/16	37 13/16	37 13/16
C—Overall length—jacket	53	65	59¾	66	80
D—Height steam nozzle	58	58	68⅜	68⅜	68⅜
E—Height return connections	29¼	29¼	29⅞	29⅞	29⅞
F—Height external heater connection	38¼	38¼	43⅝	43⅝	43⅝
G—Height mean water line	42	42	47⅜	49 9/16	49 9/16
H—Height smoke pipe adapter	38¾	38¾	40	40	40
I—Hor. distance between returns	6⅛	6⅛	7	7	7
J—Hor. Distance between steam nozzles.				18	18
Size smoke pipe	10"	10"	12"	12"	12"
Water capacity—gals.	29.5	39.5	52	69	91
Shipping weight—lbs.	1700	2000	2200	2500	2950

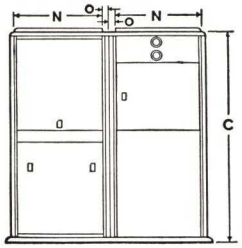


REAR ELEVATION

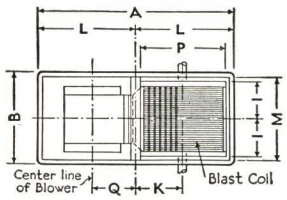
SIDE ELEVATION

Standard Gar Wood external indirect water heaters are available for 30 and 40 gallon storage tanks, all-year use, with either steam or hot water boilers.

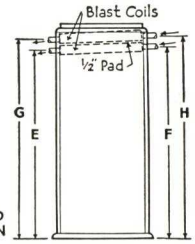
CAPACITIES AND DIMENSIONS OF AIR CONDITIONING CABINETS



FRONT ELEVATION



PLAN



END ELEVATION

Based on steam at 5 lbs. pressure. To carry hot water radiation on a split system use an indirect heater above the water line to supply radiators. Use heater ratings of manufacturer.

TYPE	322	323A	323B	324	502	503A	503B	504
B.t.u. 1 hr.—Bonnet	111,000	174,000	200,000	231,000	240,000	382,000	430,000	497,000
B.t.u. 1 hr.—At grilles	89,000	140,000	160,000	185,000	192,000	305,000	345,000	397,000
E.d.r.—Net steam	370	580	665	770	800	1270	1440	1660
C.f.m.	1200	1600	2000	2000	2600	3500	4300	4300
Air temp.—Bonnet	145°	160°	152°	166°	145°	160°	152°	166°
Motor—Hp.	⅓	⅓	⅓	⅓	½	¾	1	1
Motor pulley	2.1-2.9	2.1-2.9	2.1-2.9	2.1-2.9	2.1-2.9	2.1-2.9	Two 2.1-2.9	Two 2.1-2.9
Blower—R.p.m.	325-375	400-450	475-525	475-525	325-375	400-450	475-525	475-525
Filter area—Sq. ft.	45	45	45	45	90	90	90	90
Duct system allowable friction	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"
Steam main con.	1—3"	1—3"	1—3"	2—3"	1—3"	1—3"	1—3"	2—3"
Return connection	1—3"	1—3"	1—3"	2—3"	1—3"	1—3"	1—3"	2—3"
Intake frame	30 15/16"x31⅝"	30 15/16"x31⅝"	30 15/16"x31⅝"	30 15/16"x31⅝"	48 7/16"x38⅝"	48 7/16"x38⅝"	48 7/16"x38⅝"	48 7/16"x38⅝"
Discharge frame	30 15/16"x31⅝"	30 15/16"x31⅝"	30 15/16"x31⅝"	30 15/16"x31⅝"	48 7/16"x38⅝"	48 7/16"x38⅝"	48 7/16"x38⅝"	48 7/16"x38⅝"
Dimension A	68¼"	68¼"	68¼"	68¼"	82¼"	82¼"	82¼"	82¼"
Dimension B	32¾"	32¾"	32¾"	32¾"	50¼"	50¼"	50¼"	50¼"
Dimension C	72"	72"	72"	76"	74"	74"	74"	78"
Dimension E	66¾"	66¾"	66¾"	62¾"	65 11/16"	65 11/16"	65 11/16"	65 11/16"
Dimension F	68¾"	68¾"	68¾"	64¾"	67 11/16"	67 11/16"	67 11/16"	67 11/16"
Dimension G	1 coil only	1 coil only	1 coil only	69⅜"	1 coil only	1 coil only	1 coil only	72 5/16"
Dimension H	1 coil only	1 coil only	1 coil only	71⅜"	1 coil only	1 coil only	1 coil only	74 5/16"
Dimension I	14"	14"	14"	14"	20¾"	20¾"	20¾"	20¾"
Dimension K	16¾"	16¾"	16¾"	16¾"	20¼"	20¼"	20¼"	20¼"
Dimension L	34⅛"	34⅛"	34⅛"	34⅛"	41⅛"	41⅛"	41⅛"	41⅛"
Dimension M	30⅞"	30⅞"	30⅞"	30⅞"	48⅜"	48⅜"	48⅜"	48⅜"
Dimension N	31 9/16"	31 9/16"	31 9/16"	31 9/16"	38 9/16"	38 9/16"	38 9/16"	38 9/16"
Dimension O	1⅝"	1⅝"	1⅝"	1⅝"	1⅝"	1⅝"	1⅝"	1⅝"
Dimension P	29"	29"	29"	29"	47"	47"	47"	47"
Dimension Q	9⅛"	9⅛"	9⅛"	9⅛"	14⅛"	14⅛"	14⅛"	14⅛"

Gar Wood

INDIRECT AIR CONDITIONING EQUIPMENT

The Gar Wood Indirect Air Conditioning Equipment (made in eight (8) sizes) consists of a compact cabinet unit containing air filter, blower, humidifying chamber, and indirect, blast heater.

While designed particularly for use and greatest economy with Gar Wood Boiler-Burner Units (steam, vapor, or hot water) described in detail on pages 7 and 8, the air conditioning unit may be used effectively with any adequate existing heating plant.

● **ADVANTAGES**—There are several advantages derived from the indirect air conditioning system which are not possible with the direct warm air system as described on pages 4 and 5.

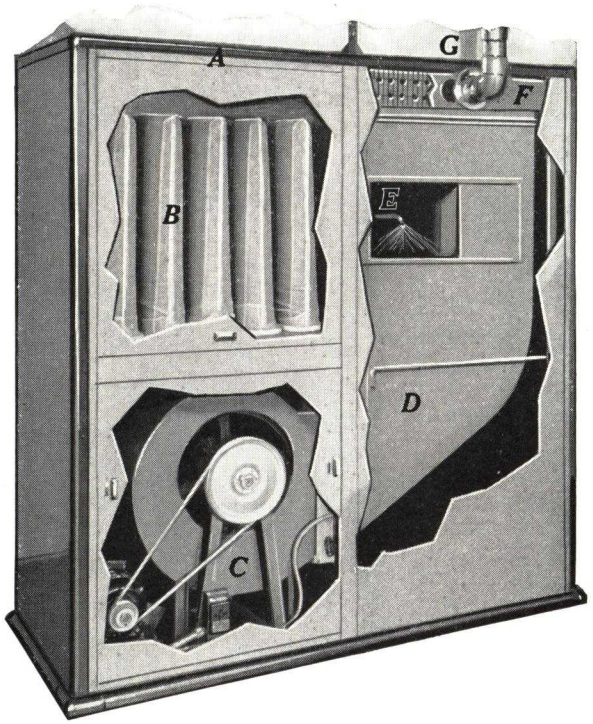
(1) **Split System**—In connection with the steam, vapor, or hot water heating boiler, the air conditioning unit can be operated either as a full indirect warm air system or as a split system (part radiation and part warm air).

In the full indirect warm air system all the steam, vapor, or hot water generated is utilized by the indirect blast heater as the sole source of heat.

In the split system part of the steam, vapor, or hot water generated is utilized to heat direct radiation and part is used by the air conditioning blast heater. Certain rooms, such as kitchens, bathrooms, servants' quarters, etc., not usually air conditioned, or second and third story rooms in existing buildings, where it is not practical to install the air conditioning duct system, may be heated by direct radiation and the remainder of the house may be "air conditioned" by the indirect unit.

(2) **Domestic Hot Water Supply**—Where a Gar Wood Boiler-Burner Unit is installed in connection with the Indirect Air Conditioning Unit, adequate year round domestic hot water supply can be furnished at one half the usual gas equipment cost. See page 7 for detailed description.

(3) **Latitude in Location**—The Air Conditioning Unit need not be located adjacent to the Boiler-Burner Unit since obviously the steam, vapor, or hot water supply and return serving the blast heater can be carried to any point in the basement. Thus a single large unit or two or more small units can often be so located as to reduce the amount of overhead duct work and make valuable unrestricted basement space available for amusement purposes.



A—Return Air Connection
B—Dry Cloth Filters
C—Blower
D—Adapter and Spray Chamber
E—Humidifier Spray
F—Blast Coil
G—Conditioned Air Connection

● **THE ASSEMBLY AND HOW IT OPERATES**—The air drawn by the fan from the recirculating air duct system is first thoroughly cleaned by passing it through a battery of bag filters located at the top of the cabinet immediately above the fan. The filter bags, which are standard equipment, are easily removed and cleansed in an ordinary washing machine. This method of air filtration is thoroughly effective and low in both initial cost and maintenance.

The clean air drawn through the fan is next blown through the humidifying chamber where the proper amount of healthful moisture is added by passing it through a warm vapor mist automatically regulated by a room humidistat.

The clean humidified air is then warmed to the proper temperature by its passage through a copper blast heater.

This completely conditioned air passing through the fresh air duct system is gently circulated throughout the various rooms under fan pressure.

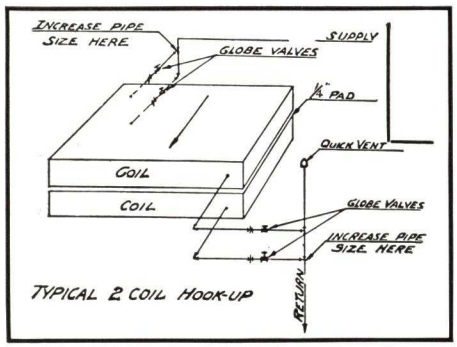
● **SUMMER COOLING**—In summer great comfort may be derived by merely circulating the filtered air through the house. During the daytime the cooler basement air may be admitted into the recirculating duct system to reduce the room temperature and at night the cooler outside air may be similarly utilized. For complete description see page 4.

Dehumidification and actual cooling is accomplished where natural cold or refrigerated water is provided. The cold water is circulated through the blast heater which is enlarged to furnish sufficient added capacity for cooling.

Mechanical cooling and dehumidification may be also accomplished by the addition of a compressor and a direct expansion coil located in the return duct.

● **GOOD APPEARANCE**—The Air Conditioning Unit is compact and comparatively small in size. The cabinet is made of sheet steel, lacquered and trimmed to match the Gar Wood Boiler-Burner Units.

● **QUIET OPERATION**—The fan and motor assembly are so designed and mounted as to eliminate all vibration and to operate very quietly at capacity. The bearings are rubber cushioned, the motor is rubber hinged, and the entire base rests on four rubber feet.



TYPICAL 2 COIL HOOK-UP

Gar Wood

CONVERSION OIL BURNERS

Gar Wood Conversion Oil Burners are designed specifically to provide existing coal-fired heating plants with clean, automatic oil burning equipment.

While the outstanding high efficiency and operating economy obtained in the complete Gar Wood Boiler-Burner and Tempered-Aire Units cannot be attained in a boiler or furnace not specifically designed for oil fuel, all of the trouble-proof efficiency of the oil burning mechanism used in these units is available in these conversion burners.

Gar Wood Conversion Oil Burners are of the pressure atomizing type designed to handle the heavier, cheaper grades of fuel. They are fully automatic and are listed and labeled as "Standard" by the National Board of Fire Underwriters' Laboratories.

For complete description of burner assembly, automatic controls, and operation, see page 3.

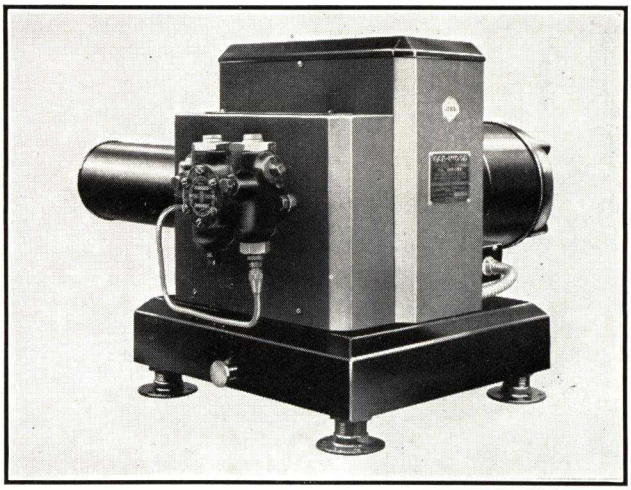
● **STURDY AND SIMPLE**—Gar Wood Conversion Oil Burners are extremely sturdy in construction and so simplified in design that a considerable number of parts, common to conventional burner practice, are entirely eliminated. There are no floats, oil valves, or complicated mechanisms to get out of adjustment. The positive electric ignition system eliminates the usual gas pilot and its extra expense.

● **ECONOMIES**—The simplification in design and mechanical operation reduces the initial cost of Gar Wood equipment below that of other burners of comparable efficiency. Again Gar Wood Conversion Oil Burners reduce fuel bills by burning heavy furnace oils (No. 3) which cost less, yet deliver more heat units per gallon. The luminous flame, firing into the ash pit, transmits heat to all the inside surfaces of the boiler. Combustion is complete—there is no smoke or odor.

● **ACCESSIBILITY**—The burner is located outside the fire box, protected from heat deteriorization and easily accessible for inspection and adjustment. The entire firing assembly can be removed through the rear in a few seconds without disturbing the burner setting.

● **NOISELESS**—The burner assembly is sturdy and vibrationless. In operation it is practically noiseless.

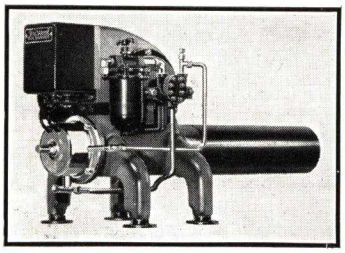
● **MODEL "W" BURNER**—The Model "W" Burner is enclosed in a pressed steel housing easily accessible for inspection. It is designed in three sizes to fulfill the most discriminating demands in the domestic conversion oil burner field. It is extremely flexible in capacity, and is easily capable of handling the heating requirements of every size of residence with from 412 to 2500 square feet of net steam radiation.



MODEL W

● **MODEL "K"** — Four burners of this type with capacities of from 412-2500 square feet of net radiation.

● **MODEL "H" BURNER**—Made only in one size. Designed to provide the small house market with an efficient burner at low cost. Capacities up to 625 square feet of net steam — 1,000 square feet of hot water radiation.

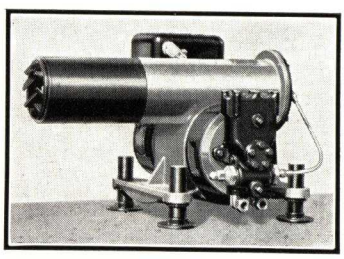


MODEL K

BURNER CAPACITIES

MODEL	GAL. PER HR.	NET RADIATION STEAM
W-1	1.65 to 2.50	412 to 750
W-2	2.50 to 6.00	700 to 1500
W-3	6.00 to 10.00	1500 to 2500
K-1	1.65 to 2.50	412 to 625
K-2	2.00 to 4.00	500 to 1000
K-3	3.00 to 6.00	750 to 1500
*K-35	5.00 to 10.00	1250 to 2400
H	1.65 to 2.50	412 to 625

For hot water, multiply the above radiation figures by 1.6; for gross load add 50%.
*Available for 60 cycles or d-c. only.



MODEL H

AUTOMATIC OIL-FIRED WATER HEATER

The Gar Wood Model "Q" Water Heaters provide the least expensive, most convenient method of producing a quick, inexhaustible supply of domestic hot water for industrial and commercial buildings. They are particularly adaptable to use in restaurants, stores, clubs, hotels, hospitals, schools, office buildings, factories, and large country estates.

Two or more units can be coupled together for any required delivery in excess of the capacity of a single unit.

The Model "Q" is an attractive, quietly operating, balanced unit which burns low-priced No. 3 fuel oil. With full electrical temperature and safety control, it needs no attention. The extremely compact design and low overall height permit its installation in shallow basements.

● **THE WATER HEATER**—The shell is constructed of heavy steel boiler plate, electrically welded with tubes rolled into the tube sheets. In principle, it is a double-pass small-power boiler similar in design to the Gar Wood Model "R" Heating Boiler described in detail on page 7. It is effectively insulated against heat loss and sound transfer. The unit has a maximum working pressure of 125 lbs. per sq. in.

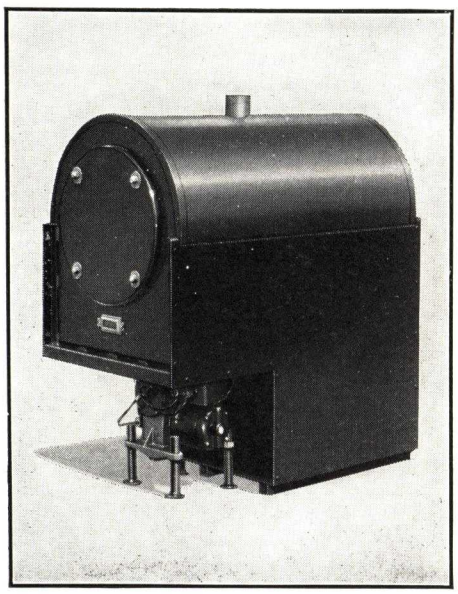
● **THE OIL BURNER**—The burner, a Gar Wood pressure atomizing unit, is designed to match and balance the boiler. For characteristics and safety controls, see page 3. The insulating deck completely isolates the burner mechanism from the effects of the heat generated.

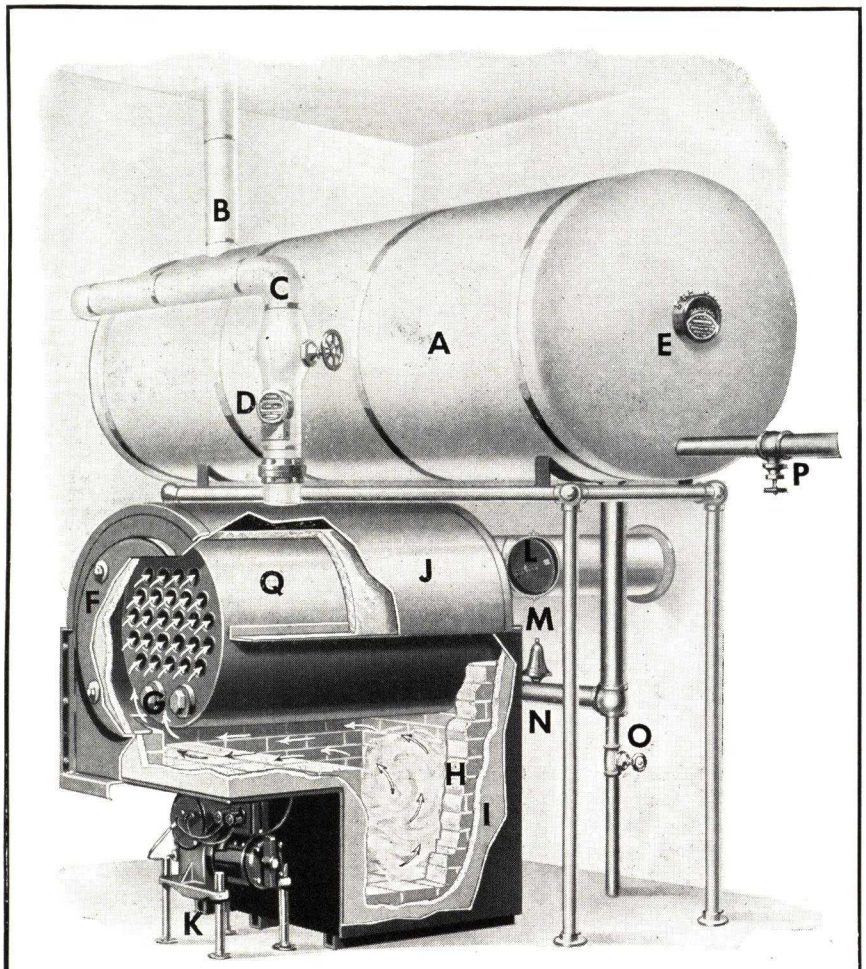
The temperature of the water is controlled by two aquastats mounted at D and E. Aquastat E starts and stops the burner to keep the water in the storage tank at the desired temperature, while aquastat D is a high limit control which shuts off the electric current to the oil burner in case of excessive water temperature at the heater outlet.

● **EFFICIENCY AND ECONOMY**—A constant, generous supply of steaming hot water is produced automatically at approximately one-half the usual operating cost of artificial gas-fired equipment and considerably less than it can be produced with coal-fired equipment, attendance considered.

● **JACKET**—The unit is enclosed in a well finished lacquered steel jacket. The oil burner is exposed at the front.

DIMENSIONS AND CAPACITIES	Q-200	Q-300
Over-all Height (Floor to Outlet)	48″	48″
Over-all Width	28¼″	28¼″
Over-all Length	49″	61″
Water Inlet	2-2″	2-2″
Water Outlet	1-3″	1-3″
Storage Tank Size	Dependent Upon Requirement	Dependent Upon Requirement
Capacity	200 Gallons 100° F. Temp. Rise per Hour	300 Gallons 100° F. Temp. Rise per Hour
Firing Rate—Gal. per hr.	1.65	2.50
Approximate Shipping Weight, with Burner	1300 lbs.	1450 lbs.



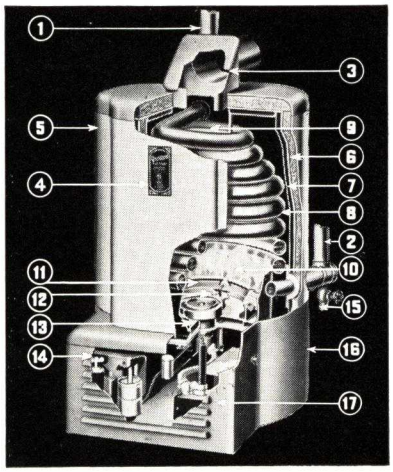


A—Hot water storage tank
B—Hot water outlet to fixtures
C—Flow line from heater to tank
D—High limit aquastat, controlling maximum temperature
E—Low limit controlling aquastat
F—Flue door
G—Water clean out plugs
H—Firebrick
I—High temperature insulation
J—Steel jacket
K—Oil burner
L—Draft adjustor
M—Water pressure relief
N—Return water line
O—Drain
P—Cold water inlet
Q—Steel fire tube heater

Gar Wood

MODEL S-50 and MODEL S-40 OIL FIRED WATER HEATERS

Model S-50 is a coil type heater, used with a separate storage tank. Its capacity is 50 gallons of water per hour, heated to 100 degrees above the temperature of the incoming water. The Model S-50 may be used with any type of storage tank selected or already installed and its compact design enables it to be locked in shallow basements and in a very small space. The oil burner is the rotary type, designed to give high efficiency in this type of heater. It has only one moving part and is quiet, dependable and long lived.



Model S-50

1. Hot water outlet, brass (1½"). Height from floor to center of outlet, 25½".

2. Cold water inlet, brass (1½"). Height from floor to center of inlet, 11".

3. Access door. For easy access to combustion chamber.

4. Power shut-off switch. Shuts off heater completely.

5. Modern design casing, made of heavy automobile body steel. Finished in two-tone green lacquer.

6. Heavy rock wool insulation. Guards against heat loss—saves fuel. 1" thick at sides, 2" thick at top.

7. Half-inch dead air space—between combustion chamber housing and chromium steel radiation shield. Provides double seal against heat loss.

8. Water coil. Efficient bee-hive shape—shaped to take full advantage of wall-flame. Heavy No. 16 gauge copper. 32" long, 1½" diameter. Tested at 300 lbs. hydrostatic and 127½ lbs. working pressure. Large area of heat absorbing surface insures quick response to hot water demands.

9. Baffle plate. Insures maximum transfer of heat to coil by slowing up passage of hot gases into flue.

10. Wall-flame. Scientifically located for quick absorption of heat by water coil.

11. Chromium steel flame rim with diffuser grilles. Results in peak operating efficiencies 15 times faster. Vaporizes oil completely.

12. Electric ignition. Sure-fire, low-cost.

13. Burner. Burns low-cost No. 2 home heating oil. 1/200th h.p. motor. 110 volt, 60 cycle current. All metal hearth. Listed as STANDARD by Underwriters' Laboratories.

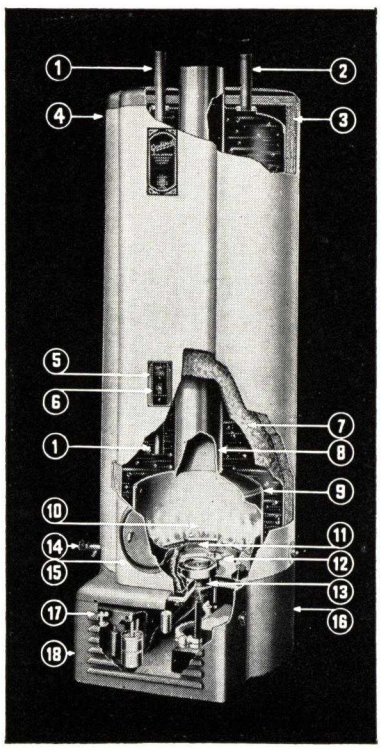
14. Oil regulating valve. Automatically insures constant rate of flow of oil to burner. Also shuts off oil flow in event of abnormal operating conditions.

15. Hose connection. For basement hot water and thorough flushing of coil and water storage tank.

16. Base. Heavy construction for lifetime durability. Fully encloses and protects burner.

17. Base screen. Removable for access to burner. **Automatic water temperature control.** Immersion or surface type. Adjustable through entire working range. Located on storage tank. Dimensions: Height, 37". Diameter, 22½".

Model S-40 is the right size for the average home. It is a storage type heater in which the oil burner and flue are built into a 40-gallon storage tank, the whole being protected against heat loss by extra heavy insulation. The capacity of this model is 40 gallons of water per hour, heated to 100 degrees above the temperature of the incoming water. The storage tank is made of heavily galvanized steel, with all joints lapped and welded. The outer casing is finished in two tone green lacquer. The same type of burner as in Model S-50 is used.



Model S-40

1. Cold water inlet (1").

2. Hot water outlet (1").

3. Extra heavy insulation. Guards against heat loss into basement. Saves fuel.

4. Modern design casing. Attractively finished in two-tone lacquer. Made of heavy automobile body steel.

5. Automatic water temperature control. Adjustable to desired temperature.

6. Power shut-off switch. Shuts off heater completely. Fully enclosed within casing.

7. Water storage tank. 40 gallons capacity. Tested at 300 pounds hydrostatic pressure, with all seams electrically welded throughout for lifetime tightness. Where water conditions preclude the use of galvanized steel, the S-50 Heater and separate copper storage tank should be used.

8. Large flue. Extends full length of water tank. Provides generous heating surface.

9. Dome type combustion chamber. Large area of heating surface insures minimum fuel bills and quick response to hot water demands.

10. Wall flame, held close to heating surfaces for efficient absorption of heat by water.

11. Quick heating, chromium steel flame rim with diffuser grilles. Results in peak operating efficiencies 15 times faster.

12. Electric ignition. Sure fire, low cost.

13. Burner proper. Burns low cost No. 2 home heating oil. 1/200th hp. motor. All metal hearth. Listed as Standard by Underwriters' Laboratories.

14. Hose connection. Provides for quick and easy flushing of tank.

15. Spring-hinged access door. For easy access to combustion chamber. Gas tight gasket.

16. Base. Heavy cast iron for lifetime durability. Fully encloses and protects burner.

17. Oil regulating valve. Automatically insures constant rate of flow of oil to burner. Also shuts off oil flow in event of abnormal operating conditions.

18. Base screen. Removable for access to burner. RECOVERY: 40 gallons per hour, 100 degrees rise in temperature.

INSTALLATION: Controls and burner prewired at factory. Burner, tank and casing assembled at factory, tested and shipped as unit. No basement assembly required.

DIMENSIONS: Height, 60½". Diameter, 22½".

SPECIFICATIONS

MODEL S-50

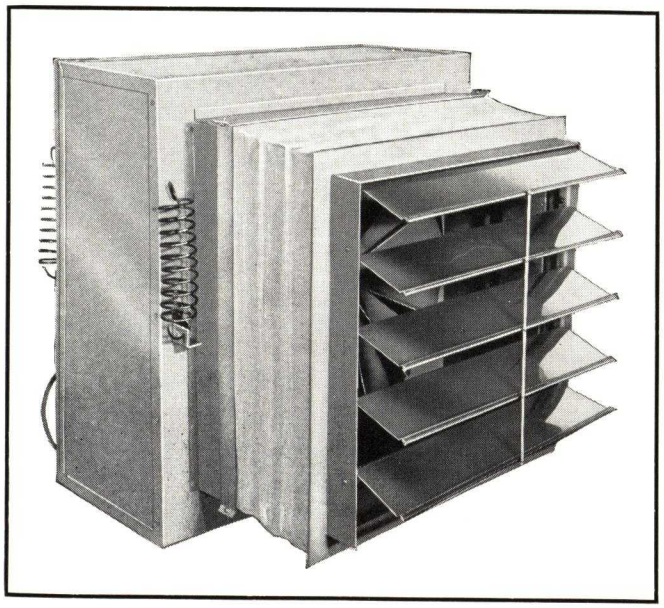
Overall Height ..... 37"	Storage Tank Size .... Up to 300 Gal.
Overall Diameter ..... 22½"	Capacity ..... 50 Gal. 100 F. Temp. Rise per Hour
Water Inlet ..... 1½"	
Water Outlet ..... 1½"	Approx. Shipping Weight ... 280 lbs.

MODEL S-40

Overall Height ..... 60½"	Storage Tank Size ..... 40 Gal.
Overall Diameter ..... 22½"	Capacity ..... 40 Gal. 100 F. Temp. Rise per Hour
Water Inlet ..... 1"	
Water Outlet ..... 1"	Approx. Shipping Weight ... 449 lbs.

ATTIC AND COMMERCIAL VENTILATOR

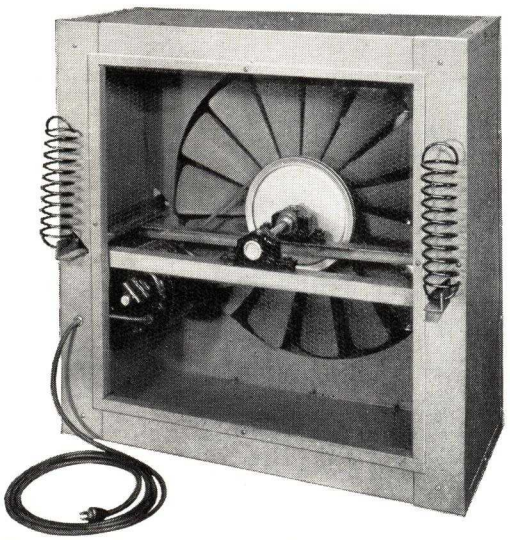
The Gar Wood Attic Ventilator will quickly and silently expel all the dead, heated air that accumulates in the bedrooms and upper part of the house during the day, and replace it with cooler,



fresher air from outdoors. Not only for home ventilation and cooling, but wherever buildings are filled with stifling air, steam, odors, smoke, fumes or dust, the ventilator will expel it and replace it with fresh, wholesome air.

The Ventilator—The ventilator consists of a quiet operating, specially designed fan and motor enclosed in a sturdy metal case which is suspended on four coil springs from the ceiling or rafters, thus assuring complete quietness when in operation.

A vibration deadening canvas boot connects the fan housing proper with a wooden frame which is installed in a window casing or other opening made for the discharge of hot air. The frame is equipped with an insect screen and an automatic outlet shutter which opens when the fan begins to operate and closes when it stops for protection against rain, dust and insects. The shutter is made of aluminum and will not corrode or stick. Everything is furnished to make the unit complete; installation can be made in a few minutes. No extra wiring is necessary. Merely plug into any convenient light current to operate.



A Heavy Wire Screen Covers the Opening in the Intake side of the Ventilator

	UNIT SIZE							
	20 in.	24 in.	30 in.	36 in.	42 in.	48 in.	54 in.	60 in.
C. F. M.	3500	5600	7500	9650	11,900	15,560	20,350	29,960
Motor H. P.	¼	¼	⅓	⅓	½	½	¾	1
Motor Type	S. P.	S. P.	Cap.	Cap.	Cap.	Cap.	Cap.	Cap.
Height	27″	31″	36″	42″	48″	55″	60″	67″
Width	27″	31″	36″	42″	48″	55″	60″	67″
Depth	30″	30″	30″	32″	32″	32″	32″	34″
Shutter Dimensions	20″x20″	24″x24″	30″x30″	36″x36″	42″x42″	48″x48″	54″x54″	60″x60″
Shipping Weight	138 lbs.	148 lbs.	180 lbs.	220 lbs.	250 lbs.	290 lbs.	360 lbs.	410 lbs.

Unit consists of propeller type fan, belt driven; electric motor with built-in overload protection; metal housing; automatic outlet shutter; insect screen; canvas connection and clamps; suspension springs.

Carwood

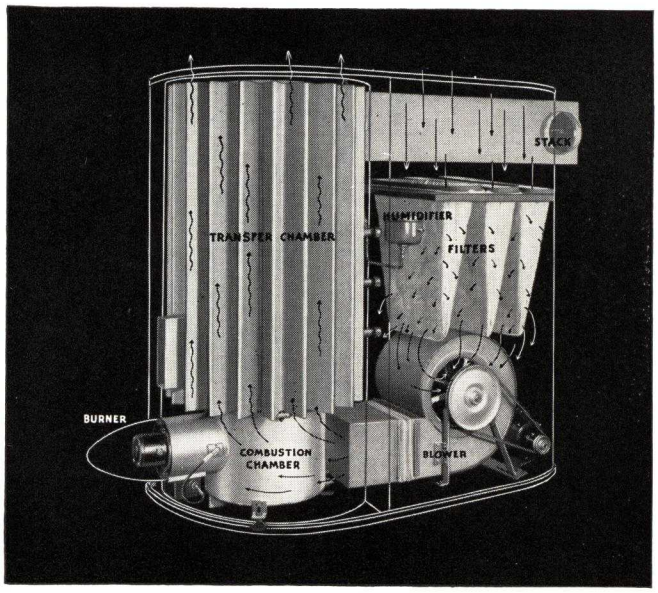
MODEL EW OIL-FIRED WINTER AIR CONDITIONING UNIT FOR SMALL HOMES

Model EW is a complete winter air conditioning unit for homes of moderate cost. It comes in one (1) size and consists of filters, blower, humidifier and oil furnace of very ingenious and simple design.

The Burner—The pressure atomizing type burner combines in one compact, quickly removable unit, the oil pump, strainer, regulating valve, electric motor, air fan and oil nozzle. The oil is forced from the pump through the hollow pump shaft, which is also the motor shaft, and through the spinning oil spray nozzle on the opposite end of the shaft. Mounted on the same hollow shaft is the air fan which mixes the proper amount of air with the oil spray and forces the mixture into the combustion chamber. Ignition is by electric spark.

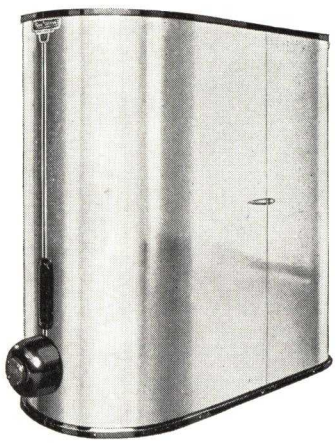
The Combustion Chamber—The Combustion Chamber is made of refractory material, to develop the high temperature necessary for complete combustion of oil.

The Transfer Chamber—Above the combustion chamber is the Star Shaped Transfer Chamber where deep triangular channelways prove a relatively large primary heated surface in contact with the combustion gases and the air stream. Inside the transfer chamber, the hot gases are restricted in their upward travel by deflectors which deflect the combustion gases against the metal walls and distribute the heat. Forced by the multivane blower, the air stream strikes the warm surfaces of the transfer chamber near the bottom and passing upward, scrubs against the hotter areas at the top.



Air Filter, Blower, Humidifier—The air filter and blower are housed in a compartment at the rear of the cabinet. The filters are of woven fabric which can be easily washed and sterilized. The blower is a quiet operating, multivane type, with oil absorbent bearings, quiet motor and self adjusting belt tension. The humidifier is automatic and operates only when the flame is burning. Thus all the functions of true winter air conditioning—Filtering, Humidifying, Heating, and Forced circulation—are accomplished in a single compact unit, providing extra leisure, extra comfort and scientific health protection at a purchase price and operating cost which easily place them within the reach of the low priced home owner.

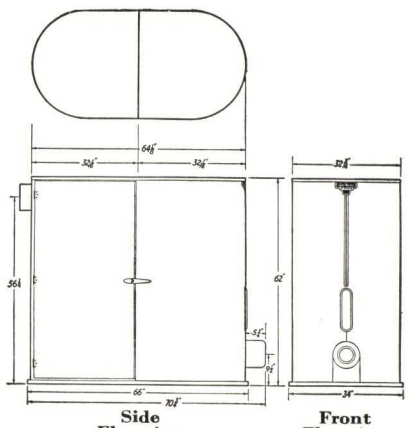
Model EW is built to the highest standards of quality and workmanship. It is finished in green lacquer with chrome trim and is extremely neat and compactly designed to fit into small basements.



CAPACITIES AND DIMENSIONS MODEL EW FURNACE, BURNER, FILTER, BLOWER UNIT

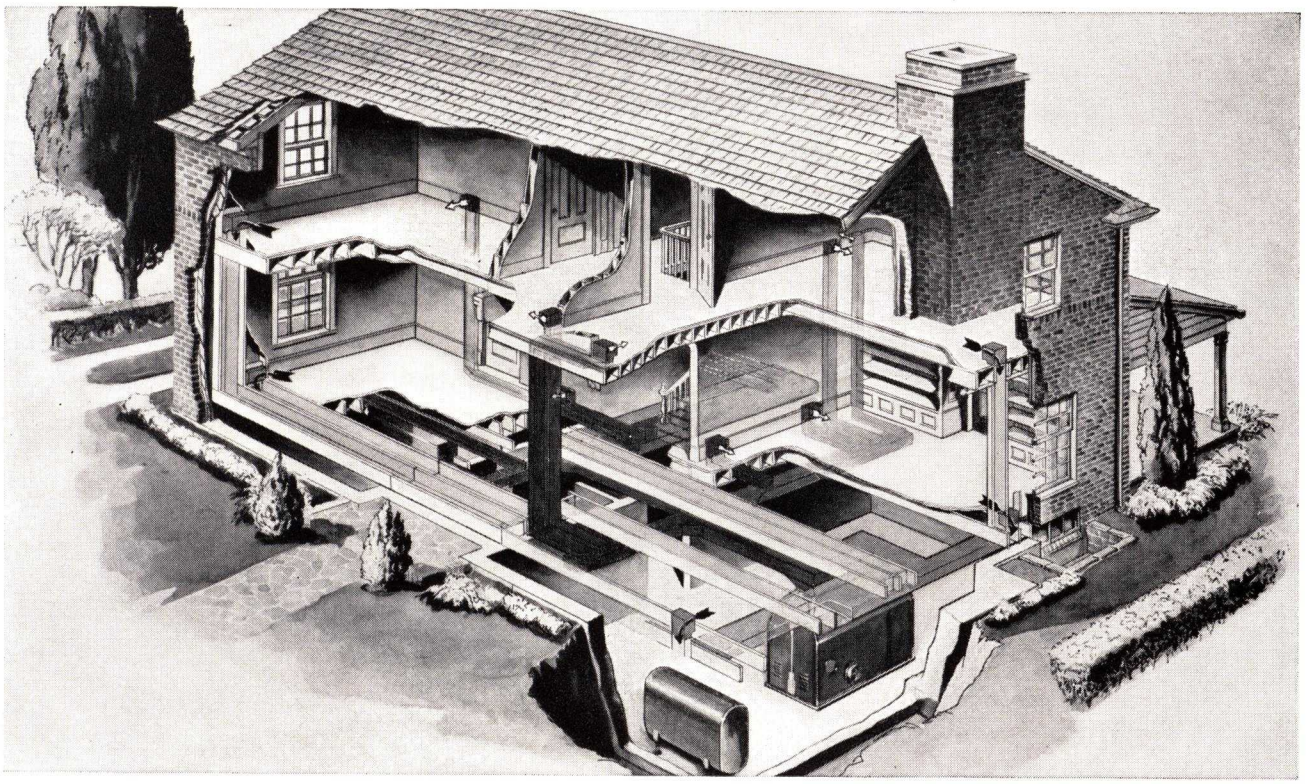
B.T.U. 1 hr. at Bonnet	100,000	Heating Surface Firebox	5.5 Sq. Ft.
B.T.U. 1 hr. at Grilles	80,000	Htg. Surf. Trans. Chamber	74.5 Sq. Ft.
Air Delivery C.F.M.	800-1200	Heating Surface Total	80 Sq. Ft.
Air Temp. at Bonnet	175°-135°	Filter Area	25.5 Sq. Ft.
Oil Rate Gal. per hr.	1.00	Min. Width Door to Admit Unit	29 In.
Smoke Pipe Diameter	7 In.	Crated Weight	840 Lb.

Note:—EW Model comes only in one size. The top dimensions are the duct width and length.



Gar Wood

Gar Wood Standardized AIRDUX Give Uniform Performance



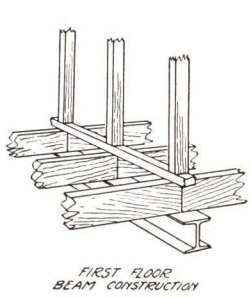
The above illustration is of a typical Gar Wood Tempered-Aire "AIRDUX" Duct System. This system is unique, in that it employs standard design fittings.

These fittings are Gar Wood laboratory developments. Their purpose is to remove all guesswork from heat and air delivery—to simplify erection—and to improve shop conditions by manufacturing standard and proved fittings for stock, rather than fabricating each job as an individually fitted installation.

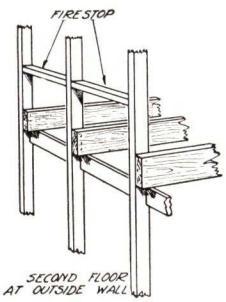
Performance tests were made for many months, on every conceivable combination of these standard fittings, to prove their correctness by determining the exact heat and air delivery. Duplicates of the fittings so developed in the laboratory are made available in all parts of the country, by supplying detail developed drawings of each part to Gar Wood distributors.

That's one of the main reasons why Tempered-Aire performance is so uniformly satisfactory everywhere—one big reason why owners say Gar Wood oil heat costs less than coal—still another reason for the growing preference of architects and builders who know the details of this system.

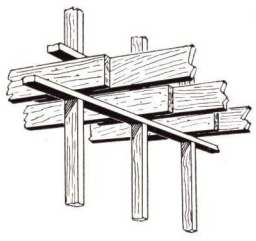
RECOMMENDED FRAMING DETAILS FOR AIR CONDITIONING DUCTS



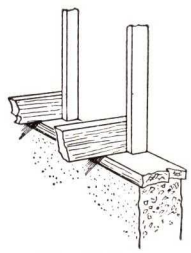
FIRST FLOOR BEAM CONSTRUCTION



SECOND FLOOR AT OUTSIDE WALL



PARTITION AT SECOND FLOOR



SILL DETAIL

AIR CONDITIONING DIVISION, **GAR WOOD INDUSTRIES, Inc. DETROIT, MICHIGAN**

Gar Wood

AUTOMATIC HEATING and AIR CONDITIONING

A COMPLETE LINE OF EQUIPMENT

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YORK—AIR CONDITIONING DIVISION

YORK ICE MACHINERY CORPORATION

GENERAL OFFICES
YORK, PA.

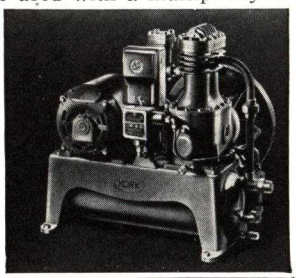
For York Refrigeration and Cold Storage Doors, see File Index

York Air Conditioning, central or unit system, is built in capacities and types to meet every requirement of the largest or smallest installation. York Air Conditioning and York experience are available through 71 conveniently located direct factory branches as well as through qualified dealers. They will be glad to co-operate with you in arriving at the correct solution of your air conditioning problem on a basis of sound engineering and correct installation. You will be repaid in lower maintenance expense, greater dependability, over-all efficiency and proper functioning of equipment in the years to come.

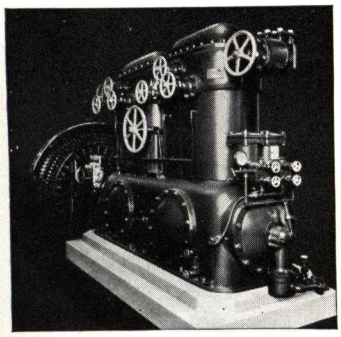
York Condensing and Water Cooling Systems Air, Economizer and Water Cooled

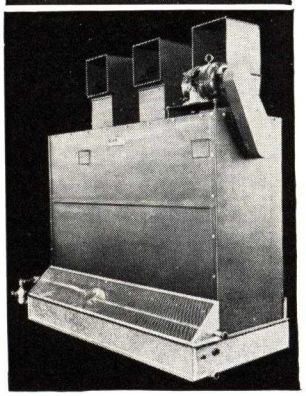
From ¼ to 1,000 hp. in single units, York Condensing Systems, designed for use with Freon-12 as the refrigerant have been universally accepted by architects and consulting engineers for installations throughout the world. In smallest sizes up to 2 hp. condensers may be air cooled. Above 2 hp. the York Economizer is used where economically justified by water costs or restrictions. Water cooled condensers of the shell and tube type are furnished for use with city water, well or cooling tower water.

York Condensing Systems can be used with a multiplicity of evaporators: Direct expansion, air cooling surface, air dehumidifiers with coils or with water coolers for the indirect method of refrigeration.



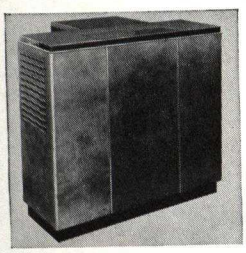
For upper floor installations specially designed counter-balanced machines are available.





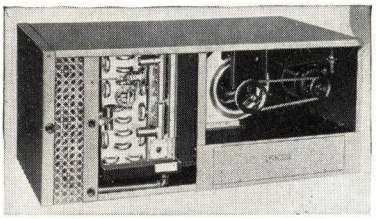
With a background of more than 6,500 Freon-12 installations of more than 60,000 tons capacity York Air Conditioning experience is unsurpassed in the industry.

York Unit Air Conditioners—Self-contained Type

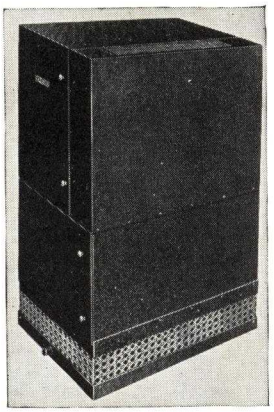


Available for small installations are a multiplicity of sizes of self-contained air conditioners which have all parts enclosed in an attractive decorative casing—soundproofed and isolated to permit of installation within the conditioned space. Sizes up to 1 hp.—air cooled and must be located at a window—requiring no other connections other than an electrical outlet. 3 and 5 hp. models water cooled and need outside air connection only for ventilation of conditioned space.

York Air Conditioners—Horizontal and Vertical Models

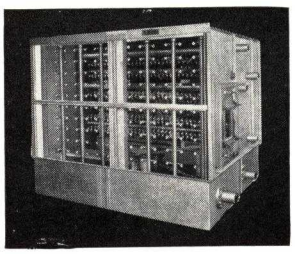


York Unit Air Conditioners, designed in capacities up to 35 tons,



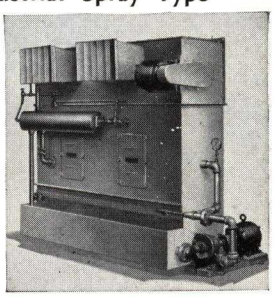
are suitable for horizontal or vertical installation, with or without ducts. York Air Conditioners can be furnished for a wide variety of applications, including all, or some of the functions of complete year 'round air conditioning, summer cooling and dehumidification, winter heating and humidification, year 'round circulation, filtering and ventilation. In all cases a definite supply of outside air can be introduced under the positive pressure of the supply fan of the conditioner.

York Standard Dehumidifiers With or Without Coils



York Air Dehumidifiers have been developed to obtain unusually efficient performance when compared with conventional air washer design—accomplished by a refined system of water distribution, and an improved inlet deflector and eliminator arrangement. Can be furnished in all sizes and capacities; 7 ft. standard length, with and without cooling coils, depending upon requirements. When evaporator coil surface is included in the spray chamber of an air dehumidifier, the usual water cooler furnished with the refrigeration system can be eliminated, thus greatly reducing the space requirements of the system. Both types of air dehumidifiers are regularly furnished as a part of central station air conditioning systems, being so arranged with fans, heating equipment, automatic controls, air distributing ductwork, and accessories, to provide any or all of the functions of true year 'round air conditioning.

York Air Conditioner—Industrial Spray Type



Among some of the applications to which York Spray Type Air Conditioners are adaptable are meat chill rooms, fruit cooling and storage rooms, textile and printing plants, bakery fermentation rooms, experimental rooms and other spaces requiring accurate control of temperature and relative humidity. Since their greatest field of application is in the low temperature field, where brine spray is required to keep the refrigerant coils defrosted, corrosive problems in connection with spray type air conditioners are particularly acute. In the York unit longer life has been insured by welded tank steel casings hot dipped galvanized, stainless steel eliminators, fan wheels and scrolls—cadmium plated fan shaft.

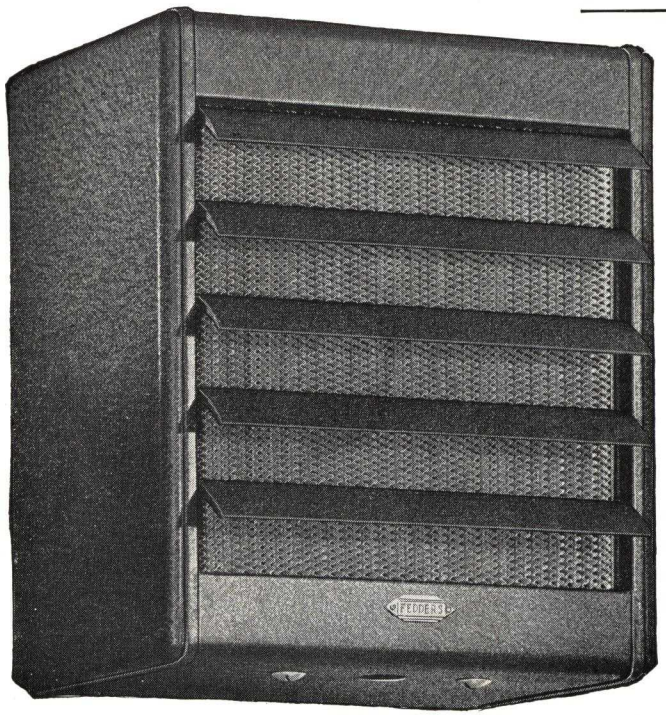
York maintains on instant call, expert engineers in every important center of demand. York ALONE gives you this service.

FEDDERS MANUFACTURING COMPANY

Manufacturers of Unit Heaters, Air Conditioners, Unit Coolers, Blast Heating and Cooling Coils, Refrigeration Valves and Equipment

57 Tonawanda Street, BUFFALO, N. Y.

SALES OFFICES IN ALL PRINCIPAL CITIES



Patents 1,970,105; 2,025,426. Other Patents Pending

FEDDERS UNIT HEATERS

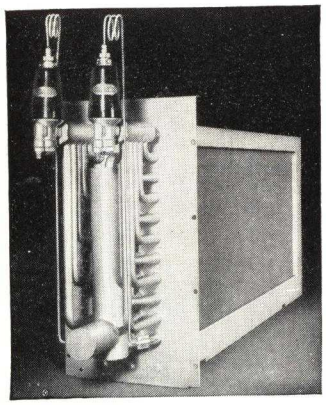
Built in a Complete Line for Commercial and Industrial Use

Handsome monopiece steel cabinets, quieter operation, rugged heating elements, rubber mounted motor and fan assemblies and a complete range of sizes with single, two and three-speed, standard and explosion-proof motors provide the correct answer to exacting commercial and industrial heating requirements. Capacities range from 75 to 1300 EDR as listed below.

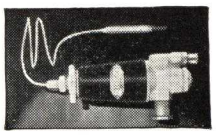
Model	3023	3141	3143	3181	3183	3211	3261	3273	3353	3311	3374	3372	3451
EDR	75	100	125	150	175	200	225	250	275	300	325	350	375
Model	3411	3421	3472	3564	3662	3653	3663	3772	3776	3871	3911	3961	3971
EDR	400	450	500	550	600	650	700	800	900	1000	1100	1200	1300

FEDDERS COILS FOR AIR CONDITIONING

Complete lines of all-copper cooling and heating coils, factory engineered and manifolded for correct distribution of cooling or heating medium. Engineered and catalogued on a package basis. Write for Bulletins 91 for direct expansion, and 105 for water type coils.



Pat's Pending

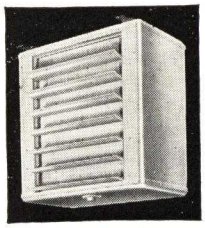


Pat. Nos. 1,974,631; 1,987,948; 2,011,379

Fedders Thermostatic Expansion Valve for Air Conditioning

FEDDERS UNIT COOLERS

Series 73 Unit Coolers are built for comfort cooling and commercial refrigeration. Handsome non-rusting cabinets, all-copper cooling element. Models for use with refrigerants or cold water.



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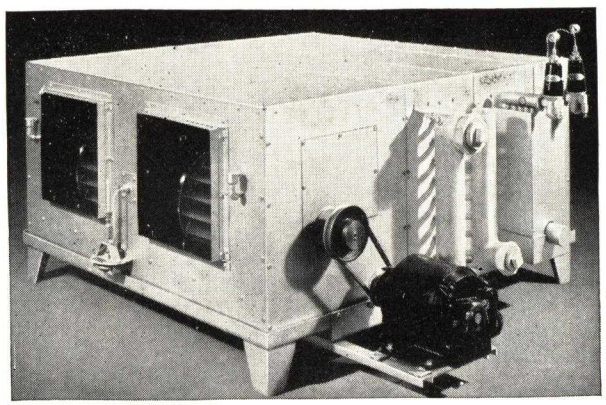


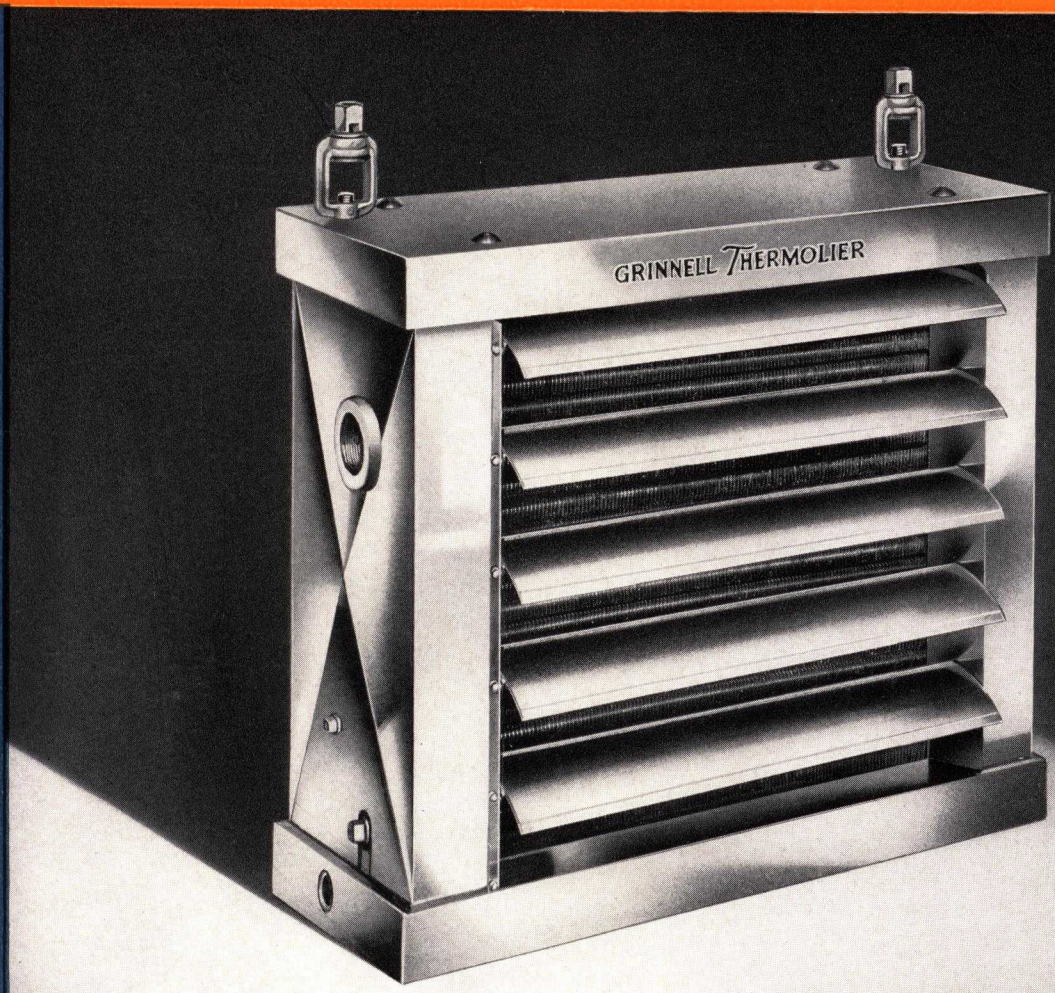
FEDDERS ALL-SEASON AIR CONDITIONING UNITS FOR COOLING AND HEATING

A complete line of All-Season Unit Air Conditioners complete with any combination of cooling and heating coils, humidifiers, filters and blowers, ready to connect to refrigerant, cold water, steam or hot water supply, cooling capacities from 1½ tons up. Available for floor or suspended installations. Write for Bulletin AC-201.

CAPACITIES—BASIC RATINGS

Model No.	181-LC	321-LC	522-LC	723-LC	1152-LC	1582-LC	1812-LC
Tons refr.	1.5	3	5	7½	11	15	18
Cfm. of standard air	600	1200	2000	3000	4400	6000	6800
Nominal motor hp.	¼	½	¾	1	1½	1½	2

GRINNELL



FOUNDED 1850

THERMOLIER

THERMOLIER

THE GRINNELL UNIT HEATER with 14 POINTS of SUPERIORITY

This booklet seeks to outline the salient features of Unit Heating and explains how this principle of heating successfully meets all of the fundamental considerations governing the choice of a heating system for factory buildings, industrial buildings and various types of commercial structures.

It also describes how this superior method of heating can be economically and efficiently utilized in its wide range of applications through the use of Thermolier—the Grinnell Unit Heater—which has structural features backed by over 50 years of heating experience and designed to meet the most rigid requirements in the heating field.

GRINNELL COMPANY
INC.
EXECUTIVE OFFICES
PROVIDENCE • RHODE ISLAND

For Sales Offices, Branches and Plants, See Inside Back Cover

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UNIT HEATING

For Comfort and Economy

THE fundamental consideration in all heating is comfort, because comfort means efficiency of employees, which in turn means more production and profits.

Comfort in heating, in the last analysis, means unawareness of the fact that there is any heating. To obtain such comfort you must have just the heat you want when and where you want it. It means that you must have more heat on cold days and less heat on mild days. It means comfort, regardless of outside temperature or interior conditions.

There are five basic factors which must be considered in the selection of a heating system for industrial and commercial applications. They are as follows:

1. UNIFORMITY OF DISTRIBUTION

This is the most important factor of all because not only does uniformity of distribution largely determine the operating efficiency of a heating system but also the comfort of occupants or employees.

2. ADAPTABILITY

The ability of the system to fit into the building conditions and the space which can economically and easily be allotted for such equipment is of utmost importance. The system must take care of individual requirements, such as the need for one temperature condition at one point and another condition at an adjacent or perhaps a far remote point.

3. ECONOMY OF OPERATION

The type of heating system which will operate most economically is the one which will meet the variations of outside temperatures and winds with the greatest exactitude.

4. ECONOMY IN FIRST COST

Consistent with operating results, first cost must always be a determining factor in choosing a heating system.

5. DEPRECIATION AND MAINTENANCE

Cost does not end with first cost alone. The whole answer to cost cannot be calculated until the relative depreciation and maintenance expense of the system is taken into consideration. The total cost at the end of 5, 10 or 20 years must be considered.

The underlying principle in unit heating is to heat a large volume of air in a small compact piece of apparatus and then distribute the air by fans to locations where it is usable.

The particular type of unit heating described in this booklet may be called the OVERHEAD type. In this system a number of small light weight highly efficient units are located overhead and the heated air is distributed both horizontally and downward, either constantly or intermittently, and controlled either automatically or manually as best fits the individual requirements.

How this overhead type of unit heating meets these five basic factors for every industrial and commercial application in a superior manner is explained in the following pages.

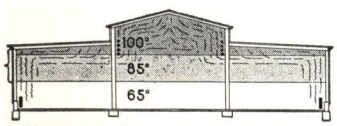
ADVANTAGES OF UNIT HEATING

● UNIT HEATING IS UNIFORM

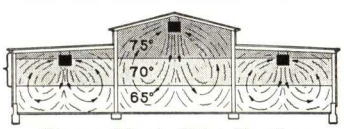
With old fashioned heating systems, the natural air circulation makes the ceiling temperature excessively high. There is no way to get the heat down into the area where it is wanted and needed.

Unit heaters insure a more even distribution of heat throughout the entire area over which they are suspended. They mechanically force the heat downward and keep it there. Although small and compact, the units have a large heating capacity and only a few of them are required to quickly and uniformly heat a large area.

This even inside temperature may easily be maintained, regardless of the distance of the units from the heating source or of changes in outside temperature, because of the flexibility of the automatic control of the units. Should cold air enter the room through the opening of doors or windows, the nearest units automatically start and



Uneven Heat Distribution with Old Fashioned System



Even Heat Distribution with Overhead Unit Heating

direct more heat to the cooled area. Immediately the desired temperature is reached, the units automatically shut off until more heat is again called for by the thermostat.

● UNIT HEATING IS HEALTHFUL

The steady even temperatures maintained by unit heaters insure more comfortable and healthful working conditions for employees. With obsolete heating systems, hot pipe coils running around side walls, or bulky radiators make nearby areas too warm for human comfort. Distant sections of the room are often too cold for efficiency in workmanship.

With unit heaters suspended overhead, the warmed air is gently directed downward, stagnant air is broken up and more healthful conditions prevail. In fact, there is an unawareness that there is any heating. Naturally, the general health of employees is enhanced, absence due to colds and sickness is reduced and improved working conditions result in increased production.

● UNIT HEATING MEETS INDIVIDUAL REQUIREMENTS

Quite frequently it is imperative to maintain different temperatures in certain rooms or areas. There are also times when only a section of a large room may be in use and heating the entire room is not only unnecessary, but it proves costly. In such instances and in similar ones, unit heating is ideal because its adaptability and its flexibility of operation easily enable it to meet such requirements quickly, economically and efficiently.

In other words, unit heating is heating which is readily "tailored to fit" the needs of the moment. Its automatic or manual control easily allows maximum, partial, intermittent or "spot" heating in any area. This is accomplished by the number of units operating, the speed at which they are running and the direction in which the heat is being distributed. Installations vary, anywhere from one unit being used in an isolated section of a building to several hundred being employed to heat an entire plant.

● UNIT HEATING IS ADAPTABLE

With unit heaters, industry has found the most "adaptable" method of heating ever known. The simplicity of the piping and the feasibility of hanging heaters from the ceiling, supporting them on columns, or suspending them from beams, has resulted in adequate heating without interfering with the comfort of operatives or the most economical arrangement of operating machinery and equipment. Unit heaters are so easily installed that they are practically portable, allowing changes to be made at any time plant conditions so dictate.

With a system of unit heating, the piping may be installed to fit plant conditions and processes. Because the units are best placed as high overhead as practical, both the supply and return piping may also be well up out of the way, and the trouble attendant to burying return piping as in old fashioned systems is entirely eliminated. Not only is this feature of "adaptability" of prime importance in new buildings, but it is of even greater importance in existing buildings, because it often allows antiquated and unsatisfactory systems to be modernized and revamped at exceedingly small cost.

UNIT HEATING IS ECONOMICAL

The use of a reasonable number and size of overhead units is essential for uniform distribution and thereby moderate velocities of air discharge are permitted to insure comfort. These requisites considered, there is no type of heating system so economical to install as the type advocated in this booklet. This is due to the following facts:

1. The heating surface is so efficient and compact that one unit heater, weighing less than 200 pounds and with a frontal area of approximately four square feet, will take the place of more than two tons of cast-iron radiation or an equivalent amount of pipe coil heating surface. This in itself represents a saving of nearly one-half in the cost of radiating elements.
2. An even greater saving is made in the labor of installing this heating surface. Even when the cost of electrical connections to unit heaters is taken into account, the saving in cost of the heating elements installed is substantial.
3. A very much smaller amount of pipe fittings and accessories is required to convey steam to the units and to convey condensation from the units back to the source of supply with unit heaters than with direct steam systems.
4. A proportionally less amount of labor is necessary for installing this small amount of supply and return piping and accessory material.
5. Increased fuel savings result from the fact that with this overhead type of unit heating, the heated air which rises to the ceiling when the units have temporarily stopped operating, is again utilized when the units automatically start and force it downward again, quickly heating the area to the desired temperature.

Exceptional Adaptability of Thermoliers During Subzero Construction

With an average outside temperature of 2° above zero and, at times, 28° below zero, Grinnell Thermoliers, operating continuously for a month, were used to temporarily heat and to cure concrete in this structure. Tarpaulin was the only enclosing medium

● OPERATING COST IS LOWER

In addition to its low first cost, a unit heating system is most economical to operate. Behind everything in heating expense is outside temperature. If the thermometer would go down to zero and stay there for four or five months, heating expense for almost any adequate type of system would be about the same. But, the outside temperature is very erratic and is constantly changing. The real test of any heating system is, therefore, to maintain an even temperature inside regardless of the changing temperature outside.

This is where the overhead type of unit heating constantly forcing the heated air down where it is needed functions so admirably. Heat is turned on or off merely by throwing a switch manually, or more exactly, by a simple automatic control governed by room temperature. Consequently, heat is only furnished when and where it is needed and no heat is wasted. Substantial fuel savings are the result.

● MAINTENANCE EXPENSE DECREASED

The simplicity of the unit heating system obviously makes it an easy and economical system to maintain. There is much less piping in the system, there are fewer joints, and there are fewer valves, traps and specialties. The presence of all of these items in direct steam systems tends to increase maintenance expense. The only possible item in the unit heating system which could make for higher maintenance expense than in the direct system, is the heater itself, with its accompanying motor and fan. This factor is of vital importance in choosing the particular type of heater for your plant. In making such choice, engineers and owners should consider carefully the merits of the units selected as regards design, construction and practicability for dependable performance.

● DEPRECIATION IS MINIMIZED

Depreciation in direct steam systems is chiefly due to corrosion and expansion and contraction strains of the pipe lines brought about by the fact that steam is alternately off and on in the lines. With the unit heater system, there is a much smaller number of lines to be considered, and, furthermore, steam is practically always in the lines, which tends to reduce pipe depreciation to a negligible quantity.

As far as depreciation of the units themselves is concerned, this is essentially a matter of proper selection of materials and their proper assembly into the type of unit which is durable beyond question. In the unit heater to be described, these factors have had earnest consideration, resulting in a unit which is built to last indefinitely as proven by experience.

THERMOLIER

THE GRINNELL UNIT HEATER

From the foregoing it is seen that the principle of overhead unit heating absolutely meets the basic considerations governing the choice of a heating system. The next step, which is of paramount importance, is to select just the right type of unit heaters produced to render this sound principle lastingly effective and thoroughly practical in all its applications.

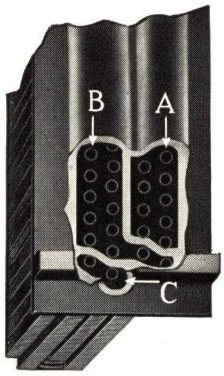
In offering Thermolier, Grinnell Company, Inc., places at the disposal of architects, engineers and owners, a quality unit heater so conservatively engineered and ruggedly built that it makes the principle of unit heating more effective and more successful over a wide field of practical applications. It is backed by an experience of over 50 years with all types of heating systems in all types of buildings. Thousands of installations throughout the country attest to its efficiency and dependable performance.

As a result of that practical experience and specialized knowledge in heating, there have been built into Thermolier, fourteen engineering and structural features which should insure the utmost confidence to those concerned with adapting the principle of unit heating to their own particular problems. For their consideration, these fourteen features are clearly described and illustrated on the following pages.

THERMOLIER

14 has these POINTS OF SUPERIORITY

1 INTERNAL COOLING LEG ASSURES CONTINUOUS REMOVAL OF CONDENSATION (Exclusive with Thermolier)



Due to the exceptional construction of the header in Thermolier, steam circulation and the removal of condensation in this unit are distinctly different than is usual in unit heaters. This most unique feature is so simple, practical and valuable that engineers and contractors alike are quick to realize its importance.

Steam is delivered into Chamber "A" of the header and circulates from there through the pitched U tubes, carrying its condensation with it into Chamber "B." By partitioning off the lower tube or tubes at the bottom of the Steam Supply Chamber "A" these tubes carry all condensation from Chamber "B" into Drain Chamber "C." In passage of this condensation through these tubes, the air from the fan is rapidly carrying off heat just as it does in the rest of the unit. The result is that these two bottom tubes form an efficient internal cooling leg, integral with the unit.

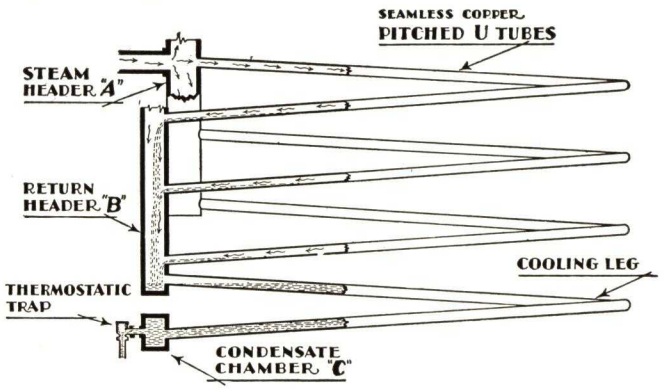
The actual cooling effect of this construction is equal to a run of more than 100 feet of the ordinary, exterior cooling leg piping.

THERMOSTATIC TRAPS OPERATE PERFECTLY WITH THERMOLIER

The Internal Cooling Leg in Thermolier makes it practical to use a thermostatic trap—the simplest of all traps—with every size and model. During operation of the unit, the internal cooling leg keeps such a trap partially or fully open at all times. As the number of openings and closings of the trap is greatly reduced, being only a fraction of those required in normal use under other conditions, the life of the thermostatic trap or valve is greatly prolonged.

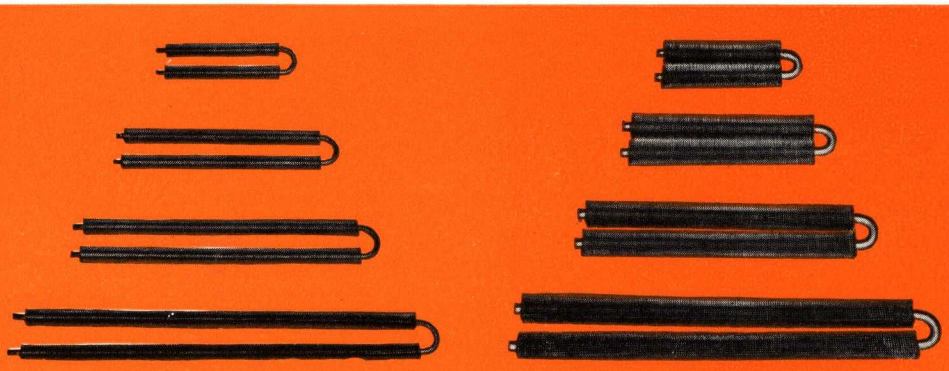
The use of such a valve or trap lowers installation costs, not only because the trap is less expensive than other types but because the piping connections are less complicated. In addition to the above advantages, a much neater and compact installation is insured. Thermolier, operating under such conditions will maintain its full efficiency indefinitely.

As the internal cooling leg acts, to a certain extent, as a vacuum condenser, drawing steam through and discharging condensation with air continually, the unit does not "air bind." Another important feature is the fact that the heating element, draining continually instead of intermittently, is not subjected to frequent changes in temperature. The life of the entire unit is, therefore, greatly prolonged because of the internal cooling leg and its various contributing advantages.

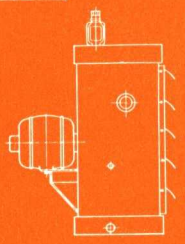


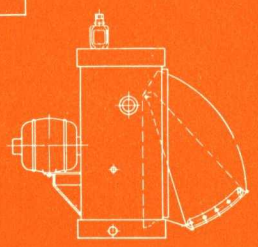
2 EVERY TUBE AN EXPANSION BEND

Every tube in Thermolier is of the "U" or hairpin type to allow for variation in contraction and expansion of the various tubes made into a single header at one end. While this method of construction is expensive because it increases the cost of symmetrically housing the unit, experience with hundreds of thousands of these tubes built into Thermolier has shown it is the most effective and practical means of compensating for varying expansion strains. It also adds greatly to the absolute dependability of the unit over long periods of time.



At left are shown one each of the various tubes used in the assembly of the heating units in the various models of Thermolier. All tubes are of the same construction, the only difference being in their length and diameter.





3 VELOCITY MEETS WIDE RANGE OF REQUIREMENTS

Getting the heated air to the area where it is wanted is primarily a function of outlet or nozzle velocity combined with a suitable directing device. Thermolier is provided with means for maintaining practically any velocity discharge to meet requirements.

The louvers of Thermolier, like its other parts, are designed to last indefinitely. These louvers are provided simply to direct the air flow in the direction required and each louver may be adjusted independently of the other. The louvers may be raised or lowered, as desired, to produce required direction of air. The louvers are so mounted as to remain permanently where set.

If buildings are of an unusual height, Thermoliers may be equipped with Velocity Nozzles. Velocity Nozzles are adjustable for medium to maximum velocity of discharge. They are furnished in the same materials and finish as the units and present a neat, attractive appearance.

4 FACTORY PACKED FOR EASY INSTALLATION

The ease with which Thermolier can be installed is, in a great measure, due to the unique manner in which it is packed before leaving the factory.

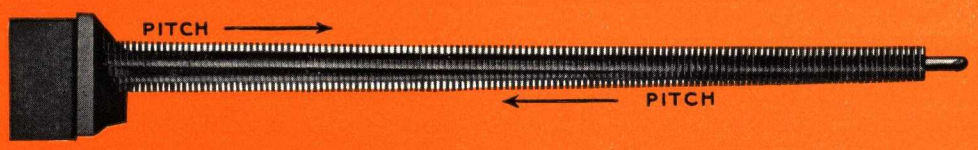
The unit itself is first enclosed in a heavy paper bag to protect its finish from marring and soiling during erection. It is then neatly packed in a specially designed, rugged wood frame with removable couplings. These frames are furnished on all of the larger models of Thermolier and greatly facilitate handling and hoisting into place without damage.

The simple instruction sheet accompanying it shows how the unit can be quickly suspended with the Grinnell Adjustable Swivel Couplings (described in Point 11), the frame easily removed and the piping connections made. If new construction or remodeling is in progress, the bag may be left in place to protect the neat appearance of the unit until it is ready for operation.

5 POSITIVE BUILT-IN DRAINAGE

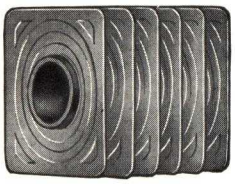
Below is an individual section cut out of a complete Thermolier heating element to show the pitch of each tube is definitely built-in and insured. This pronounced pitch provides positive and complete drainage of condensation from each individual tube, thus increasing heating efficiency and doing away with the possibility of noisy and destructive water hammer on account of accumulated condensation.

At the right is shown the assembly of the complete heating element. The pitched finned tubes are built into the header at the further end. The pitch is permanently maintained at the "U" end by the strong spring clips which clamp each bend into definite alignment and at the same time allows for contraction and expansion strains.



6 SUPERIOR HEATING ELEMENT INSURES LONG LIFE

The steam container in the heating element of Thermolier is made of seamless copper tubing, which has a great factor of safety in strength as against any practical operating conditions. Stamped square brass or copper fins, slightly corrugated for stiffness, are attached uniformly to this tubing by automatic machinery. Square fins provide 24% more radiating surface than round fins occupying the same space. This accounts in no small degree for the large amount of heat obtained from the small frontal area of Thermolier.

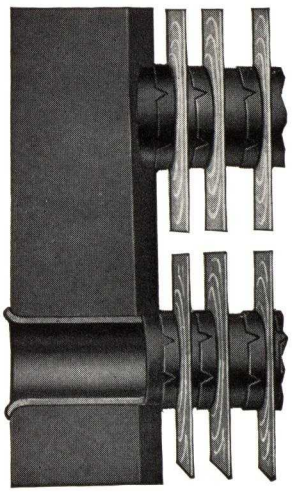


No solder whatever is used for strength in Thermolier assembly. The deep, tight fitting collars on the fins provide ample support and large metal contacts for rapid heat transfer from tubes to fins. Collars also provide uniform spacing. The final immersion of the tube and fin assembly in a solder bath is only for the purpose of establishing a permanent metal bond between fins and tubes and is not a strength factor.

7 TUBE TO HEADER CONSTRUCTION LEAK PROOF

Years of experience with the method used in expanding the copper tubes into the cast iron header prove it insures the best possible type of a joint. More than a half million of these expanded joints in Thermoliers are in actual service and, with not a single failure under the operating conditions for which they are intended, their record stands as positive proof of this statement.

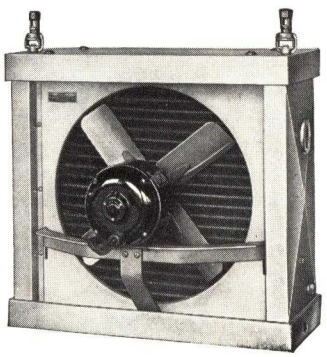
This method of header construction has been almost exclusively used for many years in the construction of condensers, heat exchangers and other important apparatus for power plant and process work. Obviously, therefore, with this construction the steam pressures which the heating element of Thermolier will withstand are limited only by the weight of the cast iron header. The standard unit is built for 125 lbs. working steam pressure and may be used with complete confidence in the safety and durability for such pressures.



8 MOTOR AND FANS MEET SPECIFIC THERMOLIER REQUIREMENTS

The motors on Thermoliers are not standard stock size motors, but are built to exacting specifications to insure each unit to operate at its highest efficiency with the minimum of electrical input. They are fully enclosed to keep out dirt and moisture. The care exercised in producing these special motors insures long service with a definite saving in power cost.

The fans have aluminum blades with a special steel hub and are made to very exacting specifications and tolerance to insure perfect balance, minimizing vibration and noise. They are attached to the motor shaft by a specially developed locking device which has absolutely eliminated the possibility of their coming loose. The mounting for motor and fan is a heavy angle iron bracket, reinforced by a sturdy, supporting brace.



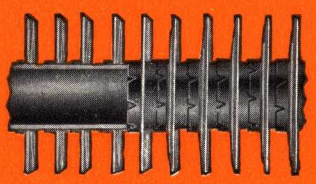
9 HEAVY FRAME GIVES GREATER RIGIDITY

Realizing that the frame is the backbone of the completed assembly, a design in which strength was the fundamental consideration was adopted for Thermolier. The heavy hanger rods extend through and become an integral part of the completed frame.

Special attention is directed to the form of the frame, which is so made that the outside copper or Ducoed steel housing covers and protects it closely and tightly from moisture and other corrosive agencies.

10 TUBE DESIGN MINIMIZES DIRT COLLECTION

The heating element in Thermolier is especially designed to reduce the possibility of dirt collection to an absolute minimum. There is absolutely no flat horizontal heating surface in the unit. This minimizing of the possibility of dirt collection is important because the deposit of dirt particles on flat surfaces tends in time to seriously decrease the efficiency of such a heating element even if it does not eventually seriously interfere with the air flow through the unit. Of the total heating surface, 89% is provided in vertical fins and the remaining 11% of the heating surface consists of the round, horizontal tubes. It is obvious that this type of construction offers no place for dirt or dust to rest or accumulate.

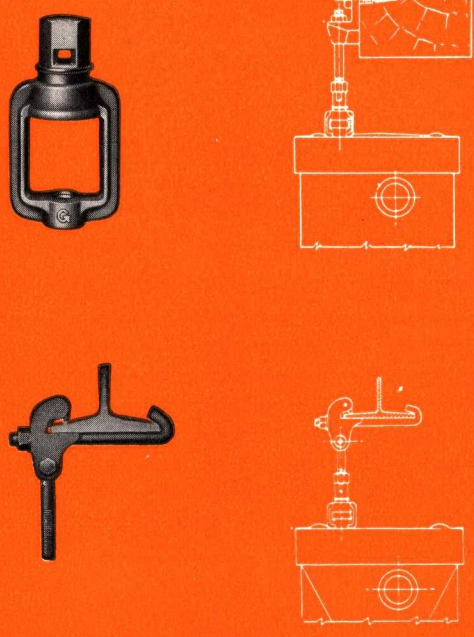


11 ADJUSTABLE HANGERS FACILITATE ERECTION

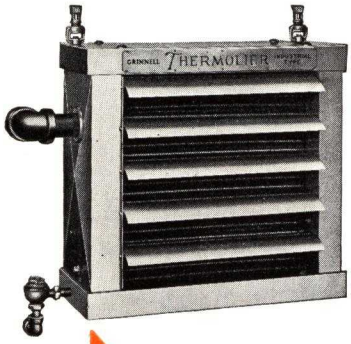
The Grinnell "Adjustable Swivel Coupling" was especially developed to provide a standard method of hanging Thermoliers. This hanger, when screwed on, is an integral part of each unit. The swivel is loose in the socket and is self-locking so that once the hanger rods are adjusted, they are automatically locked in position. This allows vibration from building or machinery to be taken up in the hanger and not transmitted to the unit.

Several methods by which Thermolier, with its Adjustable Swivel Couplings may readily be attached to various types of building construction, are indicated here.

The full line of adjustable hangers which may be utilized in connection with this special Swivel Coupling is shown in Grinnell Hanger Catalog 8. This Catalog will be sent upon request.



12 SIMPLE PIPING CONNECTIONS



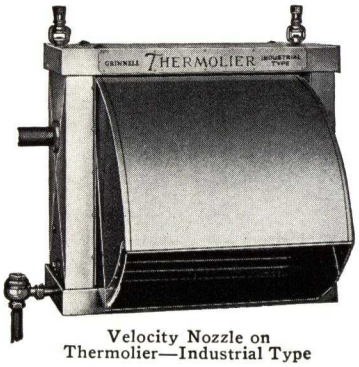
The efficient functioning of the internal cooling leg in Thermolier permits and actually requires that a thermostatic trap be connected directly to the return outlet opening. The condensation coming from the unit is cool enough so that the thermostatic trap will operate continuously even when the unit is working at maximum capacity for indefinite periods. This feature, combined with the fact that the steam supply connection is at the same end of the unit, makes for compactness, neatness and economy in the piping connections.

13 ATTRACTIVE APPEARANCE

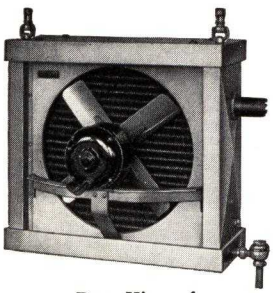
Thermolier presents a neat, attractive appearance and its finishes permit a choice to meet individual requirements. The Industrial Type is available with a non-corrosive, polished copper or chrome plated housing and is adaptable to commercial buildings, manufacturing buildings, factory offices, stores, etc., where the best in appearance is desired.

Where appearance is not of primary importance, Thermolier — Factory Type — is available with a rugged steel housing, finished in gray Duco. It is adaptable where a substantial but not elaborate appearance is required and is less likely to be marred during handling or after installation.

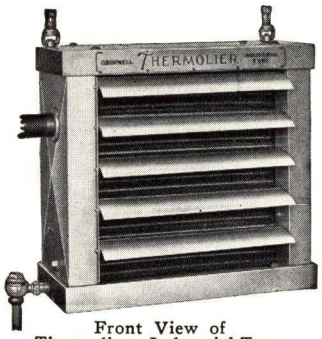
Velocity Nozzles have the same finish as the units to which they are attached.



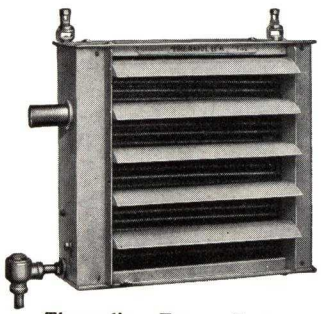
Velocity Nozzle on Thermolier—Industrial Type



Rear View of Thermolier—Industrial Type



Front View of Thermolier—Industrial Type



Thermolier—Factory Type

14 30 SIZES TO MEET YOUR EVERY REQUIREMENT

The wide range of sizes which compose the complete line of Thermoliers includes 30 sizes from which just the right type for any space or condition may be readily selected. Thousands of installations throughout the country attest to their efficiency and dependable performance, anywhere from one unit having been used to correct an unsatisfactory heating condition in an isolated section of a building, to installations of several hundred units employed to heat an entire plant.

While this type of heating is comparatively simple to lay out there are certain methods of placing Thermoliers with reference to exposures, drafts and working conditions, which greatly increase the efficiency and comfort to be obtained from them. Grinnell Company, Inc., places at your disposal half a century of experience in industrial heating and a request to any of its sales offices in all principal cities will receive prompt attention.

Thermolier—
Industrial Type

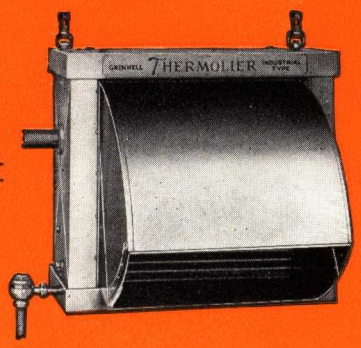
TYPES and MODELS

INDUSTRIAL TYPE

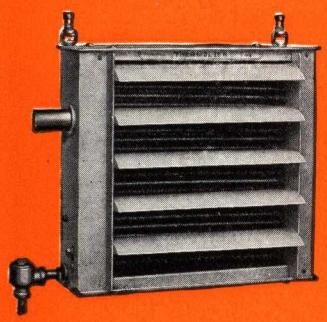
AVAILABLE with polished copper or chrome plated housing. Suitable for use in mercantile buildings, manufacturing buildings, factory offices, stores, etc., where the best in appearance is desired.

Velocity nozzles have same finish as units to which they are attached.

Made in all Models listed.



Thermolier—Industrial Type with Velocity Nozzle



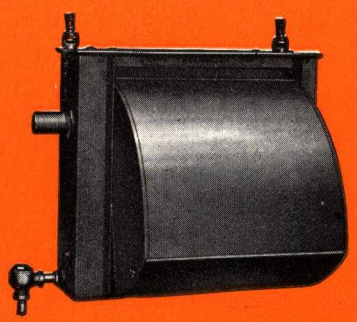
Thermolier—
Factory Type

FACTORY TYPE

AVAILABLE with steel housing, gray Duco finish. For use where the appearance is not of paramount importance. Appearance very substantial but not elaborate.

Velocity nozzles have same finish as units to which they are attached.

Made in all Models listed.



Thermolier — Factory Type with Velocity Nozzle

READY REFERENCE FOR IDENTIFICATION OF OLD AND NEW MODEL NUMBERS

Due to the fact that we have added a considerable number of sizes to our line since original model numbers were adopted, we have found it desirable to renumber all models. The following table is for ready identification of old and new model numbers. On each capacity page will be found the new as well as the old numbers.

New	20	25	30	40	45	50	60	65	70	80	90	100	110	140	180
Old	....	....	....	400A	....	400B	400	....	....	800B	800	1600A	....	1600B	1600
New	20L	25L	30L	40L	45L	50L	60L	65L	70L	80L	90L	100L	110L	140L	180L
Old	....	....	....	300A	....	300B	300	....	....	600B	600	1200A	....	1200B	1200

26
33

CONDENSED CAPACITIES

WHEN THERMOLIER IS RUN AT NORMAL SPEEDS

All based on Standard Basis of Rating: 2 lbs. Steam Pressure and 60° Entering Air Temperature.

Note: For Capacities at other Pressures and Temperatures, see Conversion Table on opposite page.

Model Number	R. P. M. at Normal Speeds	Total heat delivered B.t.u. per hr.	Equivalent Direct Radiation E. D. R.	Air delivery cu. ft. per min.	Exit air temp. °Fahr.	Condensation lb. per hr.	Air Velocity at Exit—Linear Ft. per Min.		
							Louvers Wide Open	Louvers Set at 45°	Velocity Nozzle Max.
20	1750	35,000	146	646	114	35	743	928	1337
20L	1150	26,900	112	438	122	28	505	632	908
25	1750	40,500	169	685	120	42	787	983	1415
25L	1150	30,900	128	475	127	32	546	682	981
30	1750	47,800	199	579	147	49	666	832	1198
30L	1150	35,200	147	395	156	37	454	568	818
40	1750	69,400	289	1566	104	72	1039	1402	1870
40L	1150	53,300	222	1030	112	56	682	921	1228
45	1750	81,200	339	1810	105	84	1200	1616	2150
45L	1150	62,600	261	1196	113	66	793	1070	1425
50	1750	90,700	378	1794	111	93	1173	1584	2116
50L	1150	67,100	280	1182	118	70	772	1042	1388
60	1750	104,800	437	1424	137	108	942	1272	1695
60L	1150	77,700	324	938	148	81	620	837	1116
65	1150	129,500	540	2356	115	134	785	1061	1592
65L	850	110,100	459	1792	128	114	597	807	1210
70	1150	142,000	592	2895	109	147	965	1310	1970
70L	850	117,000	490	2160	114	122	720	977	1470
80	1150	164,600	686	2884	117	171	961	1297	1951
80L	850	139,300	580	2180	125	143	727	981	1476
90	1150	189,200	788	2298	144	196	768	1036	1559
90L	850	151,600	632	1702	152	156	569	768	1155
100	1150	234,000	975	5400	103	243	1034	1499	1933
100L	850	196,000	817	4010	108	203	769	1115	1438
110	1150	259,000	1080	6290	101	269	1202	1746	2250
110L	850	211,600	883	4530	106	219	865	1256	1620
140	1150	320,000	1333	6034	113	330	1152	1671	2156
140L	850	271,000	1129	4516	120	280	864	1253	1616
180	1150	368,000	1533	4800	140	379	916	1328	1712
180L	850	294,000	1225	3528	148	304	676	980	1264

CONVERSION TABLE

CONSTANTS FOR DETERMINING THE CAPACITIES OF THERMOLIERS

AT VARIOUS STEAM PRESSURES AND TEMPERATURES OF ENTERING AIR

Based on Steam Pressure of 2 lbs. Gage and 60° Entering Air Temperature

To determine Capacity at any Steam Pressure and Entering Air Temperature, multiply Rated Capacity at 2 lbs. Steam Pressure and 60° Entering Air Temperature by Constant from Table below.

Example: Required to find the Capacity of Model 90 Thermolier at 30 lbs. Steam Pressure and 80° Entering Air Temperature. Multiply Capacity of Model 90 at 2 lbs., 60° (189,200 B.t.u.) by Constant (1.19). 189,200 B.t.u. × 1.19 = 225,148 B.t.u.

Steam Pressure Pounds—Gage	Temperature of Entering Air—Degrees Fahr.											
	—10°	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°	100°
0	1.54	1.45	1.37	1.27	1.19	1.11	1.03	0.96	0.88	0.81	0.74	0.67
2	1.59	1.50	1.41	1.32	1.24	1.16	1.08	1.00	0.93	0.85	0.78	0.71
5	1.64	1.55	1.46	1.37	1.29	1.21	1.13	1.05	0.97	0.90	0.83	0.76
10	1.73	1.64	1.55	1.46	1.38	1.29	1.21	1.13	1.06	0.98	0.91	0.84
15	1.80	1.71	1.61	1.53	1.44	1.34	1.28	1.19	1.12	1.04	0.97	0.90
20	1.86	1.77	1.68	1.58	1.50	1.42	1.33	1.25	1.17	1.10	1.02	0.95
30	1.97	1.87	1.78	1.68	1.60	1.51	1.43	1.35	1.27	1.19	1.12	1.04
40	2.06	1.96	1.86	1.77	1.68	1.60	1.51	1.43	1.35	1.27	1.19	1.12
50	2.13	2.04	1.94	1.85	1.76	1.67	1.58	1.50	1.42	1.34	1.26	1.19
60	2.20	2.09	2.00	1.90	1.81	1.73	1.64	1.56	1.47	1.39	1.31	1.24
70	2.26	2.16	2.06	1.96	1.87	1.78	1.70	1.61	1.53	1.45	1.37	1.29
75	2.28	2.18	2.09	1.99	1.90	1.81	1.72	1.64	1.55	1.47	1.39	1.32
80	2.31	2.21	2.11	2.02	1.93	1.84	1.75	1.66	1.58	1.50	1.42	1.34
90	2.36	2.26	2.16	2.06	1.96	1.88	1.79	1.71	1.62	1.54	1.46	1.38
100	2.41	2.31	2.20	2.11	2.02	1.93	1.84	1.75	1.66	1.58	1.50	1.42
125	2.51	2.39	2.30	2.20	2.13	2.03	1.93	1.85	1.77	1.68	1.60	1.53

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RECOMMENDATIONS

1. For Maximum B.t.u. Capacity per Unit of Electric Consumption.	Use Models 30, 60, 90, 180.
2. For Maximum Normal Velocity without use of Velocity Nozzle.	Use Models 20, 25, 30, 40, 45, 50, 60, 65, 70, 80, 90, 100, 110, 140, 180.
3. For Lowest Outlet Temperatures (usually used when steam pressures are high).	Use Models 20, 25, 40, 45, 50, 65, 70, 80, 100, 110, 140.
4. Where Quietness of Operation and Low Velocity are requisite.	Use Models 20L, 25L, 30L, 40L, 45L, 50L, 60L, 65L, 70L, 80L, 90L, 100L, 110L, 140L, 180L.
5. For any one of above—Plus Extremely High Velocity.	Use Models as listed above for any given condition—with addition of Velocity Nozzle.

For Data at conditions other than listed, see our complete Thermolier Data Book. Copy on request.

DIMENSIONS

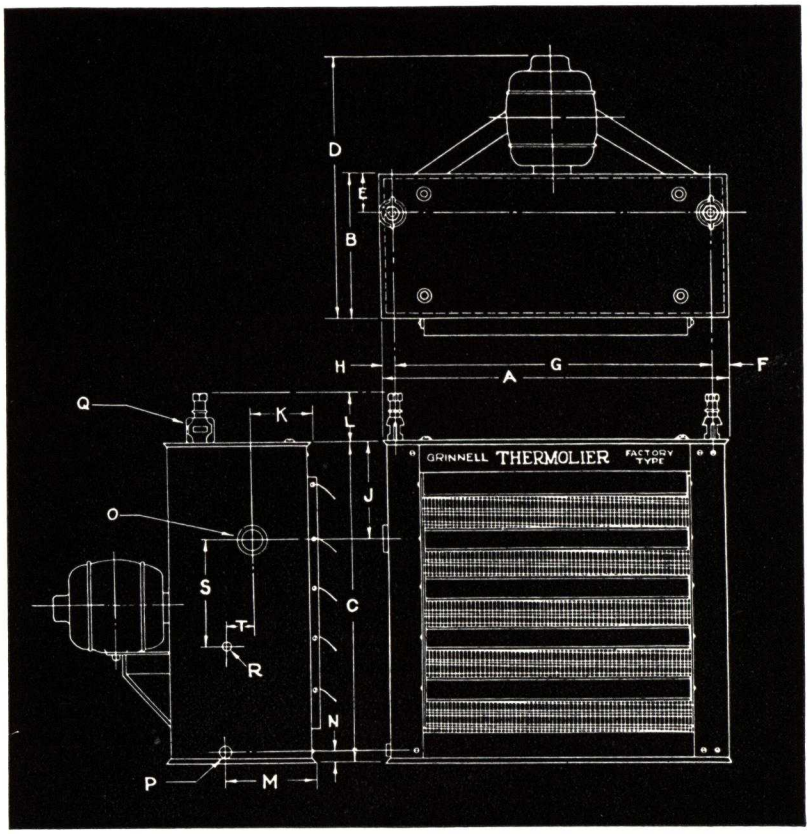
FACTORY TYPE

125 Lbs. Maxmimum Working Steam Pressure

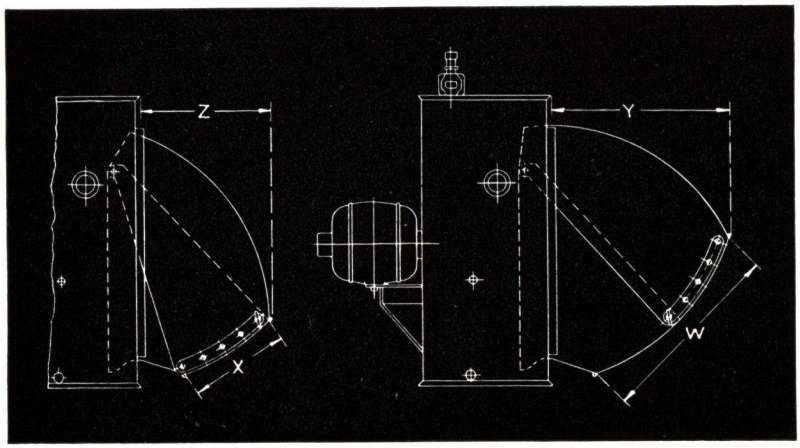
Model Numbers	20 20L 25 25L 30 30L	40 40L 45 45L 50 50L 60 60L	65 65L 70 70L 80 80L 90 90L	100 100L 110 110L 140 140L 180 180L
A	16	21 1/4	27 3/4	36 7/16
B	8 1/8	9 3/8	9 3/4	11 1/16
C	13	18 1/2	25 9/16	32 3/4
*D	14 5/8	16 1/2	19 15/16	24 1/8
E	2	2 11/16	2 13/16	3 7/16
F	31/32	1 1/16	1 11/16	1 1/2
G	14	19 1/8	24 7/8	33 11/16
H	1 1/32	1 1/16	1 3/16	1 1/4
O	◄1	◄1 1/2	◄2	◄2 1/2
P	1/2	3/4	‡1	‡1 1/4
†Q	3/8	1/2	5/8	7/8
R	3/8	3/8	3/8	3/8
Louvers	4	4	5	6

APPROXIMATE WEIGHTS
Complete Units—Pounds

Net	75	105	190	400
Shipping	85	145	245	545



APPLICATION OF VELOCITY NOZZLE TO FACTORY TYPE UNIT



All dimensions given in inches.

◄Steam tappings "O" in table apply to units listed except as follows: Models 25 and 25L, 3/4"; 50 and 50L, 1 1/4"; 80 and 80L, 1 1/2"; 140 and 140L, 2".

Air vent "R" is tapped 3/8-inch, but can be bushed as required.

*This dimension varies slightly with different motors.

†Adjustable Swivel Coupling (furnished with Thermolier) tapped standard bolt thread.

‡Outlets bushed to pipe size next smaller than indicated in table.

VELOCITY NOZZLES
Discharge Openings

Length	10 3/4	14 3/4	20 3/4	28
W–Max.	8 1/4	12 3/4	16 15/16	23
X–Min.	3 3/8	6 3/4	8 7/16	10 1/2

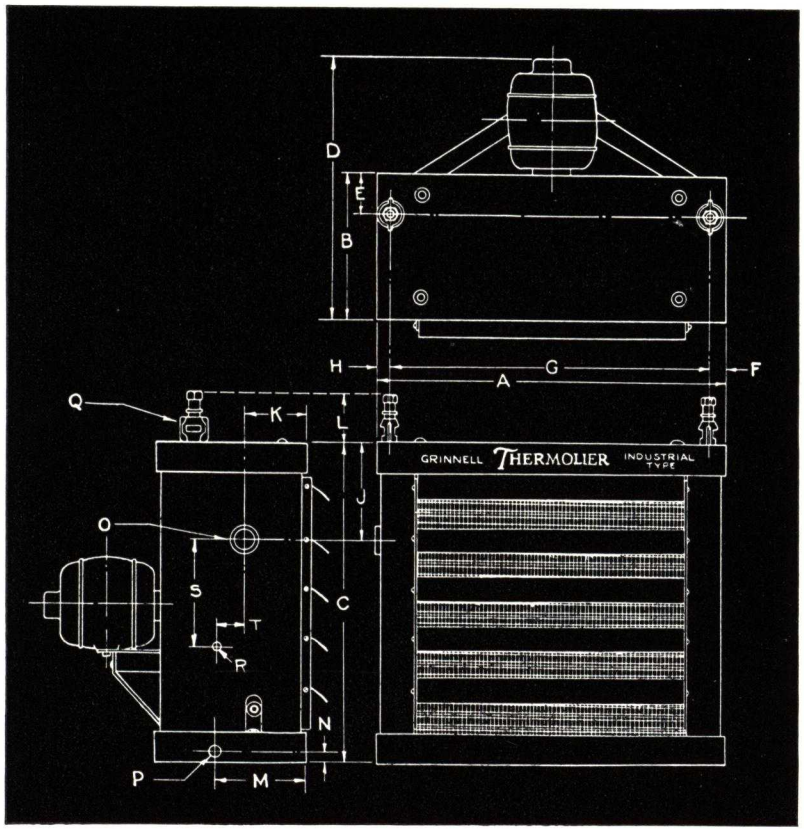
Overhang

Y–Max.	8 5/8	11	15 1/4	22 1/2
Z–Min.	5 7/8	8	10 3/4	14 1/2

DIMENSIONS

INDUSTRIAL TYPE

125 Lbs. Maxmimum Working Steam Pressure



Model Numbers	20 20L 25 25L 30 30L	40 40L 45 45L 50 50L 60 60L	65 65L 70 70L 80 80L 90 90L	100 100L 110 110L 140 140L 180 180L
A	15 13/16	21 1/8	27 3/4	36 7/16
B	8 1/2	10 7/16	11 7/8	12 3/4
C	13	18 7/16	25 1/2	32 5/8
*D	14 5/8	17	21	25
E	2 3/16	2 15/16	3 7/8	4 1/4
F	7/8	1	1 11/16	1 1/2
G	14	19 1/8	24 7/8	33 11/16
H	15/16	1	1 3/16	1 1/4
O	◄1	◄1 1/2	◄2	◄2 1/2
P	1/2	3/4	‡1	‡1 1/4
†Q	3/8	1/2	5/8	7/8
R	3/8	3/8	3/8	3/8
Louvers	4	4	5	6

APPROXIMATE WEIGHTS
Complete Units—Pounds

Net	75	105	190	400
Shipping	85	145	245	545

APPLICATION OF VELOCITY NOZZLE TO INDUSTRIAL TYPE UNIT

All dimensions given in inches.

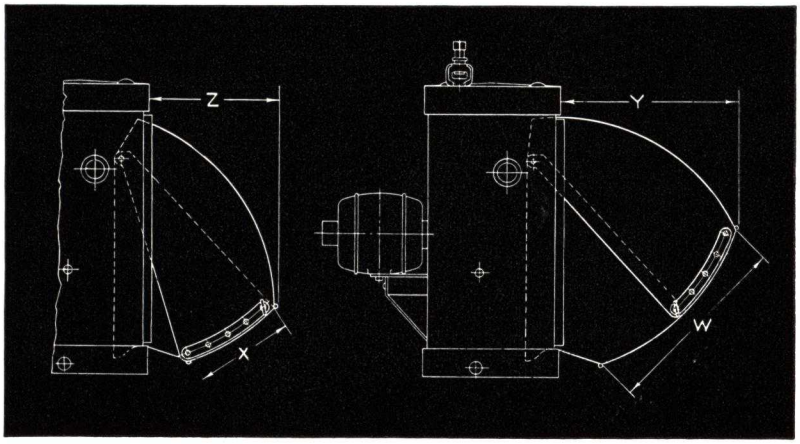
◄Steam tappings "O" in table apply to units listed except as follows: Models 25 and 25L, 3/4"; 50 and 50L, 1 1/4"; 80 and 80L, 1 1/2"; 140 and 140L, 2".

Air vent "R" is tapped 3/8-inch, but can be bushed as required.

*This dimension varies slightly with different motors.

†Adjustable Swivel Coupling (furnished with Thermolier) tapped standard bolt thread.

‡Outlets bushed to pipe size next smaller than indicated in table.



VELOCITY NOZZLES
Discharge Openings

Length	10 3/4	14 3/4	20 3/4	28
W–Max.	8 1/4	12 3/4	16 15/16	23
X–Min.	3 3/8	6 3/4	8 7/16	10 1/2
Overhang				
Y–Max.	8 5/8	11	15 1/4	22 1/2
Z–Min.	5 7/8	8	10 3/4	14 1/2

PIPING CONNECTIONS

TYPICAL PIPING CONNECTIONS FOR VACUUM OR VENTED RETURN GRAVITY SYSTEMS

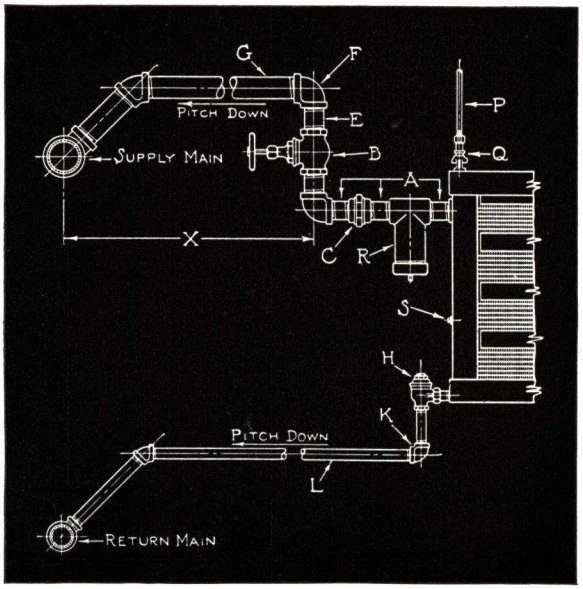


Fig. 1

Fig. 1 for equipments where distance "X" is less than 10 feet

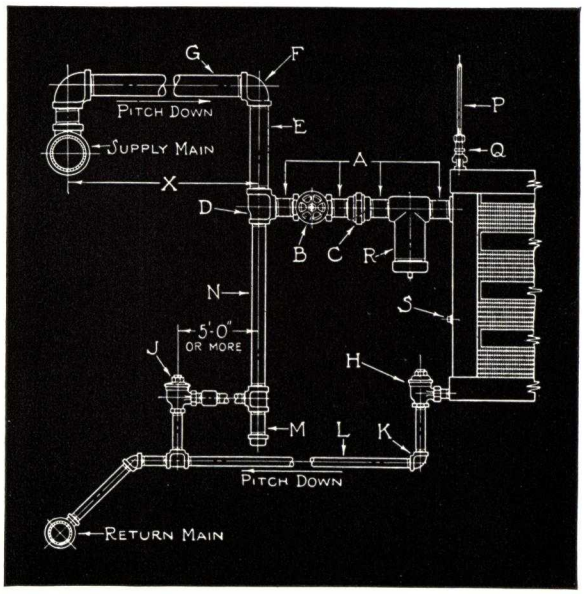


Fig. 2

Fig. 2 for equipments where distance "X" is more than 10 feet

TYPICAL SCHEDULE OF MATERIAL FOR THE ABOVE CONNECTIONS

Model Numbers	25L 25	20 20L 30 30L	50 50L	40 40L 45 45L 60 60L	80 80L	65 65L 70 70L 90 90L	140 140L	100 100L 110 110L 180 180L
Size of Drip Tapping	½"		¾"		1"		1¼"	
Size of Bushing furnished for above	.....		.....		1" x ¾"		1¼" x 1"	
A Nipples	¾"	1"	1¼"	1½"	1½"	2"	2"	2½"
B Globe or Gate Valve	¾"	1"	1¼"	1½"	1½"	2"	2"	2½"
C Union	¾"	1"	1¼"	1½"	1½"	2"	2"	2½"
D Cast Iron Tee	.....	.....	.....	.....	.....	.....	.....	.....
E Pipe	¾"	1"	1¼"	1½"	1½"	2"	2"	2½"
*F Cast Iron Reducing Elbow	.....		.....		.....		.....	
*G Supply Run-out	.....		.....		.....		.....	
†H Thermoflex Trap 0 to 25 Lbs.	½" No. 2		¾" No. 2		¾" No. 3, 4		See Note	
25 to 125 Lbs.	½" No. 100A		½" No. 100A		¾" No. 100A		1" No. 100A	
†J Thermoflex Trap 0 to 25 Lbs.	½" No. 2		½" No. 2		½" No. 2		½" No. 2	
25 to 125 Lbs.	½" No. 100A		½" No. 100A		½" No. 100A		½" No. 100A	
K Cast Iron Elbow	¾" x . . . §		1" x ¾"		1" x ¾"		1¼" x . . .	
L Pipe	¾"		1"		1"		1¼"	
M Scale Pocket	1¼"		1¼"		1¼"		1½"	
N Pipe	1¼"		1¼"		1¼"		1½"	
P Hanger Rod (See pages 20 and 21)	⅜"		½"		⅝"		⅞"	
Q Adj. Swivel Coupling (Furnished)	⅜"		½"		⅝"		⅞"	
R Sediment Strainer	¾"	1"	1¼"	1½"	1½"	2"	2"	2½"
S Pipe Plug (Furnished)	⅜"		⅜"		⅜"		⅜"	

*Size governed by installation conditions.

†Union required if other than a union end trap is specified.

Note: Trap H = 1" No. 4 for Models 100, 100L, 110, 110L, 140L and 180L; 1¼" No. 4 for Models 140 and 180.

§½" Nos. 2 and 3 traps have ¾" outlets.

PIPING CONNECTIONS

TYPICAL PIPING CONNECTIONS FOR CLOSED RETURN GRAVITY SYSTEMS

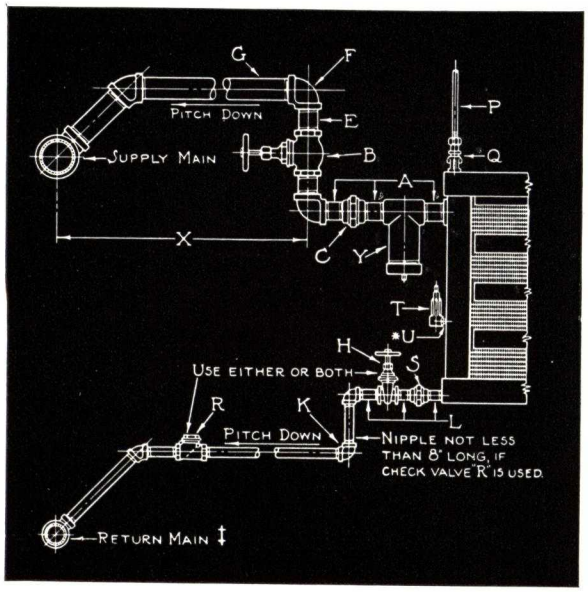


Fig. 3
Fig. 3 for equipments where distance "X" is less than 10 feet

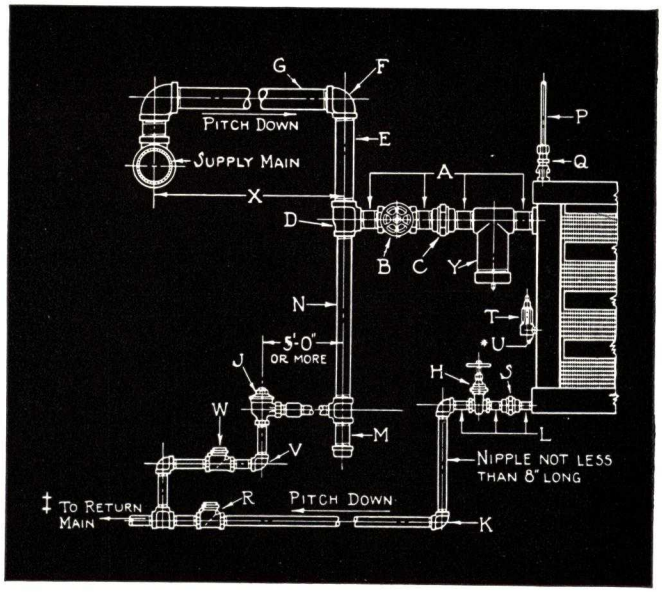


Fig. 4
Fig. 4 for equipments where distance "X" is more than 10 feet

‡Note: Return mains or risers must be vented, preferably at point where lines drop below waterline of boiler

TYPICAL SCHEDULE OF MATERIAL FOR THE ABOVE CONNECTIONS

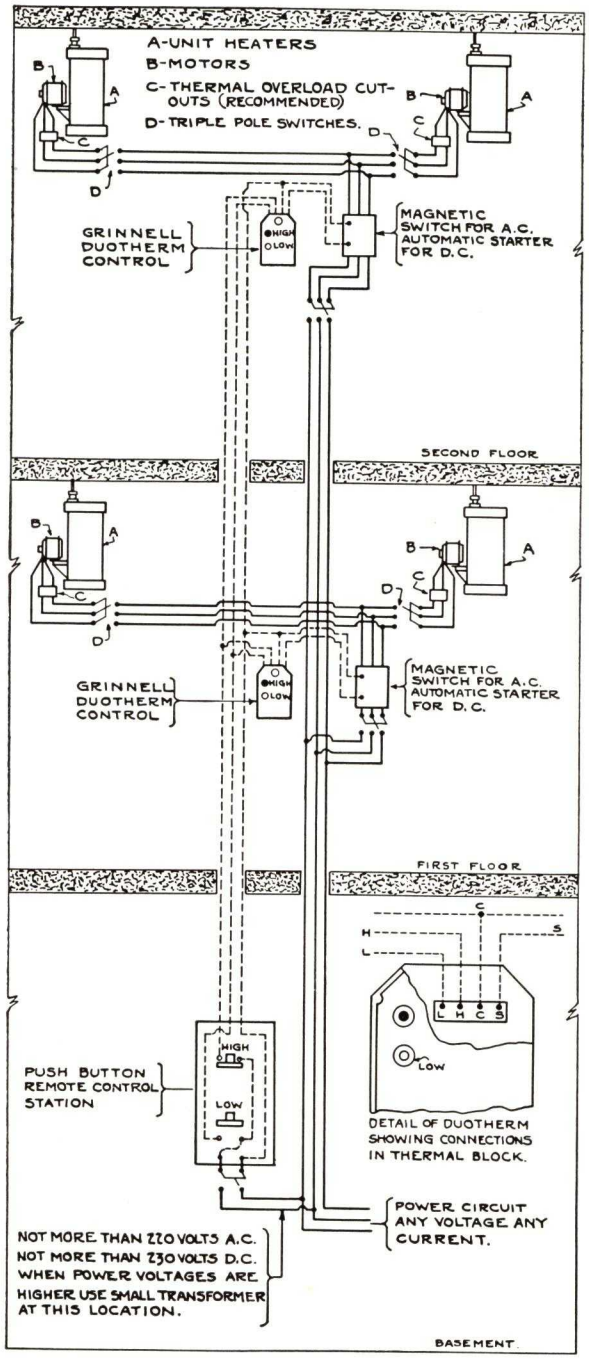
	Model Numbers	25 25L	20 20L 30 30L	50 50L	40 40L 45 45L 60 60L	80 80L	65 65L 70 70L 90 90L	140 140L	100 100L 110 110L 180 180L
	Size of Drip Tapping	½"		¾"		1"		1¼"	
	Size of Bushing furnished for above	.....		.....		1" x ¾"		1¼" x 1"	
A	Nipples	¾"	1"	1¼"	1½"	1½"	2"	2"	2½"
B	Globe or Gate Valve	¾"	1"	1¼"	1½"	1½"	2"	2"	2½"
C	Union	¾"	1"	1¼"	1½"	1½"	2"	2"	2½"
D	Cast Iron Tee	.....	.....	.....	.....	.....	.....	.....	.....
E	Pipe	¾"	1"	1¼"	1½"	1½"	2"	2"	2½"
*F	Cast Iron Reducing Elbow	.....		.....		.....		.....	
*G	Supply Run-out	.....		.....		.....		.....	
H	Gate Valve	½"		¾"		¾"		1"	
†J	Thermoflex Trap 0 to 25 Lbs.	½" No. 2		½" No. 2		½" No. 2		½" No. 2	
	25 to 125 Lbs.	½" No. 100A		½" No. 100A		½" No. 100A		½" No. 100A	
K	Cast Iron Reducing Elbow	¾" x ½"		1" x ¾"		1" x ¾"		1¼" x 1"	
L	Nipples	½"		¾"		¾"		1"	
M	Scale Pocket	1¼"		1¼"		1¼"		1½"	
N	Pipe	1¼"		1¼"		1¼"		1½"	
P	Hanger Rod (See pages 20 and 21)	⅜"		½"		⅝"		⅞"	
Q	Adj. Swivel Coupling (Furnished)	⅜"		½"		⅝"		⅞"	
R	Check Valve	¾"		1"		1"		1¼"	
S	Union	½"		¾"		¾"		1"	
T	Air Valve	⅛"		⅛"		⅛"		⅛"	
U	Bushing	⅜" x ⅛"		⅜" x ⅛"		⅜" x ⅛"		⅜" x ⅛"	
V	Cast Iron Elbow	¾" x . . . §		¾" x . . . §		¾" x . . . §		¾" x . . . §	
W	Check Valve	¾"		¾"		¾"		¾"	
Y	Sediment Strainer	¾"	1"	1¼"	1½"	1½"	2"	2"	2½"

*Size governed by installation conditions.
§½" Nos. 2 and 3 traps have ¾" outlets.
†Union required if other than a union end trap is specified.

DUOTHERM CONTROL
FOR UNIT HEATING SYSTEMS

THE Grinnell Duotherm Control is a device for regulating room temperatures where unit heating systems are installed. With this device a high temperature is automatically maintained when required, and a low temperature automatically maintained during idle hours such as at night and on Sundays and holidays. This wide range of high and low temperatures cannot be secured by the ordinary single thermostat control.

The advantages to be secured from this control are at once obvious to anyone familiar with the proper and most economical handling of heating equipments in industrial plants. Bulletin No. A-3 giving a more complete description of this product, also a detailed analysis of the economies to be had by its use, will be mailed upon request.



Typical Unit Heater Installation Showing How Grinnell Duotherms May All Be Controlled from One Central Point by High-Low Remote Control

REMOTE CONTROL

The Grinnell Duotherm is applicable to single room temperature control but the most important economies to be gained by its use are in the remote control of temperatures throughout large plants. When so used, the temperatures throughout the whole plant are under the control of one responsible individual in the boiler room or any other convenient place.

CONSTRUCTION

The thermostats together with switches, coils and other parts are compactly mounted in a cast aluminum box with sides and bottom perforated to provide proper circulation of air around the thermostats. Adjustment of the thermostats is made through a hinged and locked bottom drop panel. Binding post strip is plainly marked to insure proper connection of wiring to the device.

High or black push-button and *low* or red push-button are enclosed in a separate compartment.

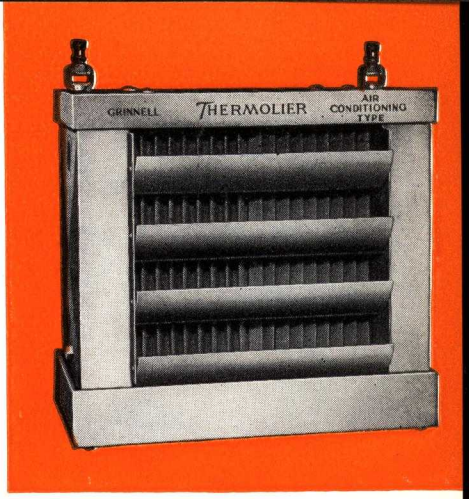
Whenever *high* temperature control thermostat is in operation, a red bull's eye is illuminated by a small electric light in a properly ventilated enclosure on top of the main unit.

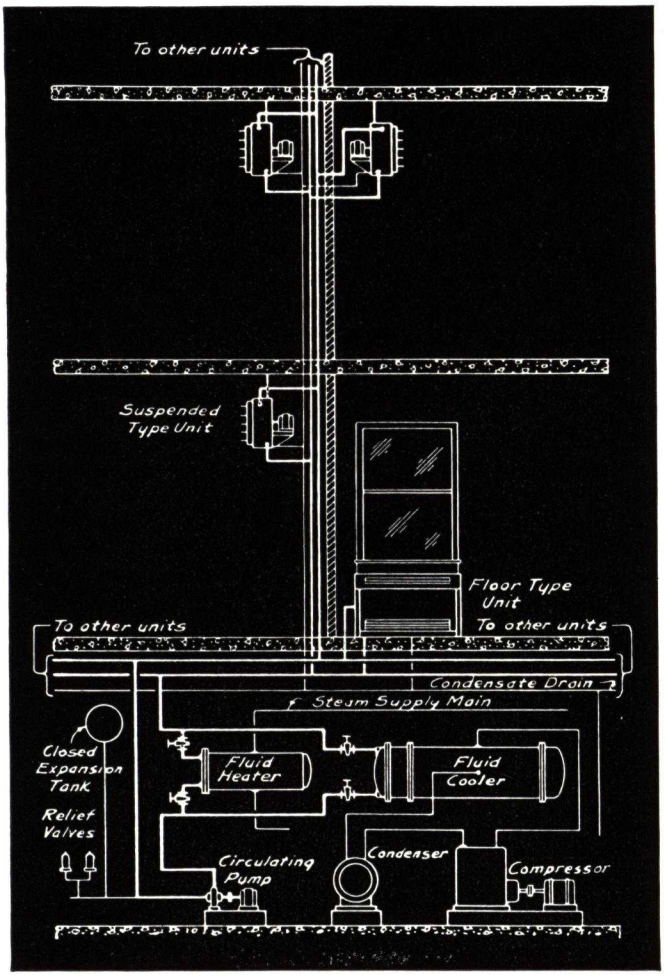
Remote control, a standard two-button push-button box, can be mounted on wall or other convenient point.

■

Note: Magnetic Switch for A.C. or Automatic Starter for D.C. must always be used when Grinnell Duotherm Controls are installed, regardless of the number of units to be controlled.

AIR CONDITIONING TYPE





WITH Thermolier—Air Conditioning Type—it is just as easy to cool and dehumidify a building in summer as it is to heat it in winter. By reference to the drawing at the left, which shows a typical application of this equipment, the absolute simplicity and easy adaptability of this system to existing buildings becomes at once apparent.

Simplicity of installation is possible because the air is conditioned right at the point where it is needed. Instead of circulating a large volume of air which has been conditioned at a central point, this system circulates the cooling or heating fluid through small pipes and all the air conditioning takes place right at the unit. Units can be placed anywhere—suspended from the ceiling either exposed or concealed—or placed on the floor in an attractive cabinet.

This basic principle, besides making for practicability of installation, also lowers the first cost and provides for local control thus cutting the operating expense.

The sketch at the left shows a fluid heater with steam supply main for heating in winter and a fluid cooler with condenser and compressor as one method of cooling the fluid for summer use. Other methods of cooling such as ice bunkers or steam vacuum refrigerating systems may just as well be used. Conditions surrounding each individual installation govern the choice of the refrigeration method.

A booklet with complete description of this Air Conditioning Type unit will be sent by any of our branch offices on request.

ELECTRIC TYPE

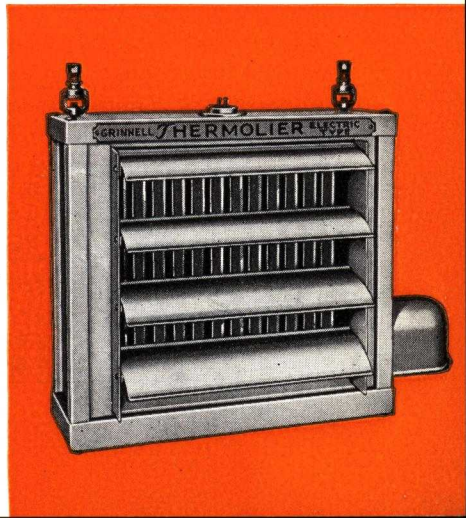
THE Grinnell Thermolier is also offered in the Electric Type to meet a long recognized need for the same ideal heating comfort that unit heaters are providing in so many industrial and commercial buildings. This new development provides such heating perfection for isolated buildings where steam or hot water is not conveniently or economically available. This is especially true of plants generating their own power or where power can be purchased at favorable rates.

Where climatic conditions are such that heating is a more or less intermittent thing, this unit which is made in six models, will provide ample heat for large areas without necessitating the installation of boilers.

In fact, the adaptability of this heater is such that it successfully meets a great variety of unusual heating requirements. This will readily be apparent when it is realized that the Grinnell Thermolier—Electric Type—has all of these advantages:

1—100% Efficiency
2—Perfect Automatic Control Obtainable
3—Elimination of Boiler Installation, Maintenance and Repair
4—Uniform Heat Distribution
5—Economical Installation
6—Portability
7—Saving in space as against ordinary Electric Heaters of equal capacity.

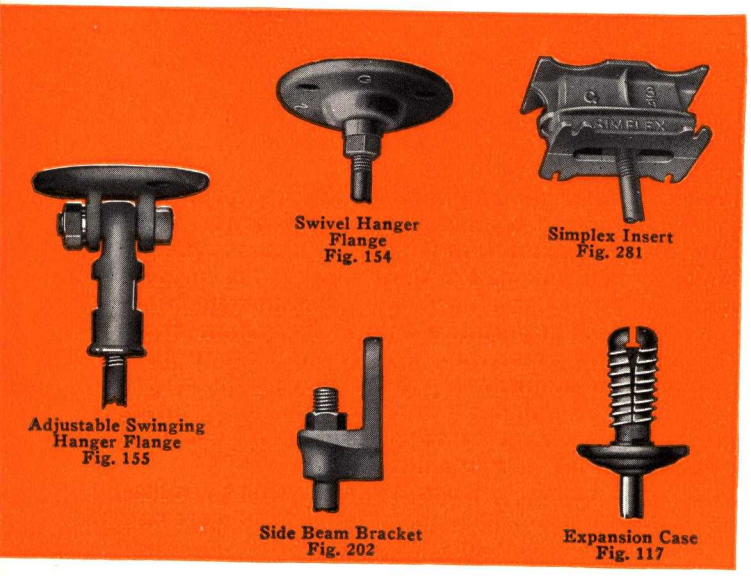
A booklet giving dimensions, capacities, motor characteristics, etc., will be mailed on request.

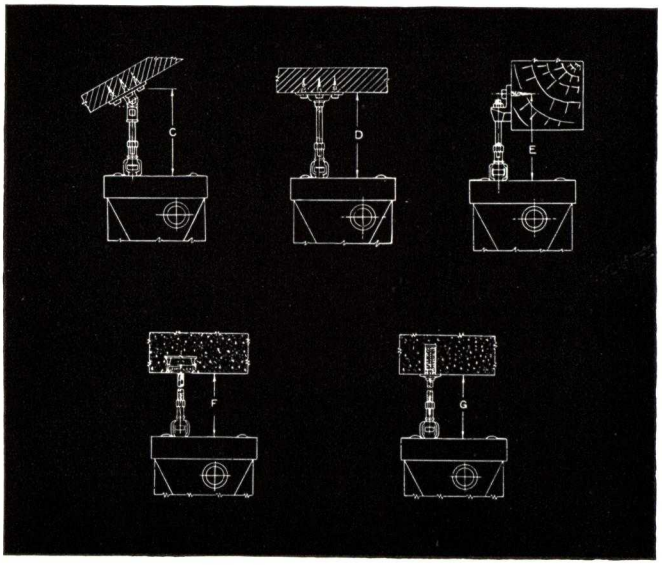


The following is a partial list of typical locations where these units may be installed to advantage:

Power Plants
Sub-Stations
Temporary Construction
Bridge Control Houses
Valve Houses
Gatekeeper Houses
Gasoline Stations
Garages
Drying Processes
Waiting Rooms
Crane Cabs
Bridge Toll Houses

ADJUSTABLE HANGERS



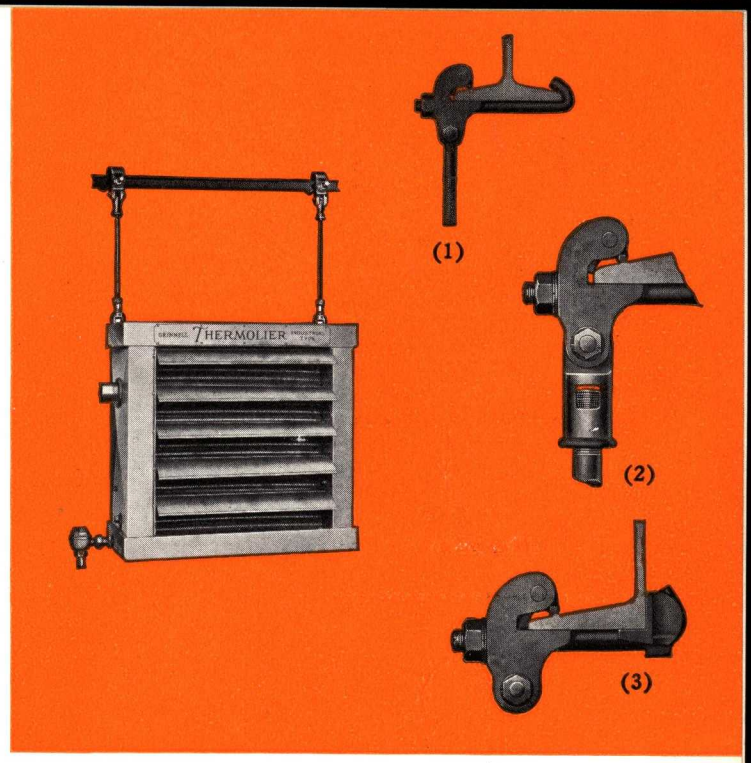


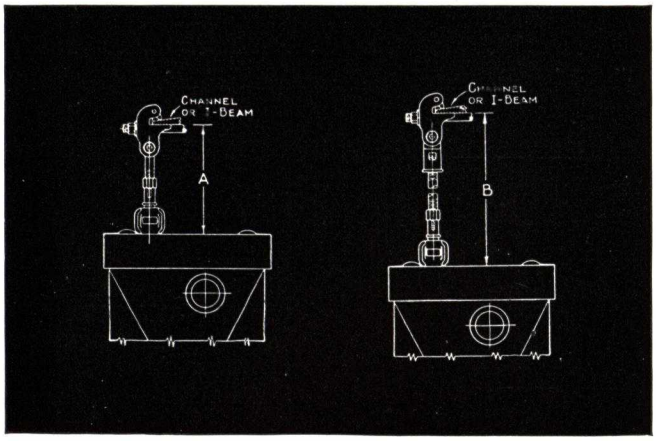
Application of Adjustable Hangers to Thermolier	Quantity and Size, Per Hanger			
	20-20L 25-25L 30-30L	40-40L 45-45L 50-50L 60-60L	65-65L 70-70L 80-80L 90-90L	100-100L 110-110L 140-140L 180-180L
Suspended from Pitched Wood Roofs				
For Ordering Hangers, Specify—				
(Quan.) (Rod size) Fig. 155 Adj. Swinging Hanger Flanges	1–⅜″	1–½″	1–⅝″	1–⅞″
(Quan.) (Size) Coach or Wood Screws	2–1½″ # 18	3–⅜″x2″	3–½″x2″	3–⅝″x2″
(Quan.) (Rod size) Fig. 140 Hanger Rods. (State Length*)	1–⅜″	1–½″	1–⅝″	1–⅞″
*For correct Hanger Rod Length, deduct from Dimension "C"	4½″	5½″	6″	9″
Suspended from Flat Wood Roofs or Ceilings				
For Ordering Hangers, Specify—				
(Quan.) (Rod size) Fig. 154 Swivel Hanger Flanges	1–⅜″	1–½″	1–⅝″	1–⅞″
(Quan.) (Size) Coach or Wood Screws	2–1½″ # 18	3–⅜″x2″	3–½″x2″	3–⅝″x2″
(Quan.) (Rod Size) Fig. 140 Hanger Rods. (State Length †)	1–⅜″	1–½″	1–⅝″	1–⅞″
† For correct Hanger Rod Length, deduct from Dimension "D"	2½″	2½″	3½″	5″
Suspended from Side of Wood or Concrete Beams				
For Ordering Hangers, Specify—				
(Quan.) (Rod size) Fig. 202 Side Beam Brackets	1–⅜″	1–½″	1–⅝″	1–⅞″
(Quan.) (Size) Coach Screws—for Wood Beams	1–⅜″x2½″	1–½″x3″	1–⅝″x3″	1–⅞″x4″
(Quan.) (Size) Fig. 117 Expan. Bolts & Cases—for concrete	1–⅜″x2″	1–½″x2½″	1–⅝″x3″	1–⅞″x4½″
(Quan.) (Size) Hexagonal Nuts	1–⅜″	1–½″	1–⅝″	1–⅞″
(Quan.) (Rod Size) Fig. 140 Hanger Rods. (State Length ‡)	1–⅜″	1–½″	1–⅝″	1–⅞″
‡ For correct Hanger Rod Length, deduct from Dimension "E"	1½″	2″	3″	5″
Suspended from Concrete (by Inserts)				
For Ordering Hangers, Specify—				
(Quan.) (Rod size) Fig. 281 Simplex Inserts	1–⅜″	1–½″	1–⅝″	1–⅞″
(Quan.) (Rod size) Fig. 282 CB-Universal Inserts, with Nuts	1–⅜″	1–½″	1–⅝″	not made
(Quan.) (Rod Size) Fig. 140 Hanger Rods. (State Length §)	1–⅜″	1–½″	1–⅝″	1–⅞″
§ For correct Hanger Rod Length, deduct from Dimension "F"	1″	1½″	1½″	2″
Suspended from Concrete (by Expansion Cases)				
For Ordering Hangers, Specify—				
(Quan.) (Rod size) Fig. 117 Expansion Cases	1–⅜″	1–½″	1–⅝″	1–⅞″
(Quan.) (Rod size) Fig. 215 Ceiling Plates	1–⅜″	1–½″	1–⅝″	1–⅞″
(Quan.) (Rod size) Fig. 140 Hanger Rods. (State Length▼)	1–⅜″	1–½″	1–⅝″	1–⅞″
▼For correct Hanger Rod Length, deduct from Dimension "G"	0″	0″	0″	1″

ADJUSTABLE HANGERS

Suspended from I Beams or Channels

1. Shows Universal Side I Beam Clamp, Fig. 225; with Extension Eye Bolt, Fig. 220.
2. Shows application of Extension Piece, Fig. 157, and Hanger Rod to Universal Clamps.
3. Shows Universal Channel Clamp, Fig. 226.





For Ordering Short Hangers, Specify—

(Quan.) (Rod size) { Fig. 225 Universal Side I Beam Clamps (State depth, weight and type of beam) or Fig. 226 Universal Channel Clamps (State depth, weight and type of channel).

(Quan.) (Rod size) { Fig. 220 Extension Eye Bolts (Specify length from table below–*).

LENGTHS OF EXTENSION EYE BOLTS REQUIRED FOR VARYING LENGTHS OF DIMENSION "A"

Using Fig. 220 Extension Eye Bolt, in conjunction with either Fig. 225 or 226 Clamps

Model Numbers	20-20L 25-25L 30-30L		40-40L 45-45L 50-50L 60-60L		65-65L 70-70L 80-80L 90-90L		100-100L 110-110L 140-140L 180-180L	
	*	"A"	*	"A"	*	"A"	*	"A"
Fig. 220 Ext. Eye Bolt:								
Short	2½"	5" –6¼"	2¾"	6" – 7½"	3"	6⅞"– 8⅝"	3¼"	9" –10½"
Medium	4"	6½"–7¾"	4¼"	7½"– 9"	4½"	8⅜"–10⅛"	4¾"	10½"–12"
Long	5½"	8" –9¼"	5¾"	9" –10½"	6"	9⅞"–11⅝"	6¼"	12" –13½"
Hanger Rod Size		⅜"		½"		⅝"		⅞"

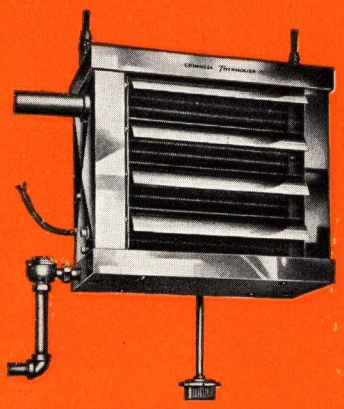
For Ordering Longer Hangers, Specify—

(Quan.) (Rod size) { Fig. 225 Universal Side I Beam Clamps (State depth, weight and type of beam) or Fig. 226 Universal Channel Clamps (State depth, weight and type of channel).

(Quan.) (Rod size) Fig. 157 Extension Pieces.

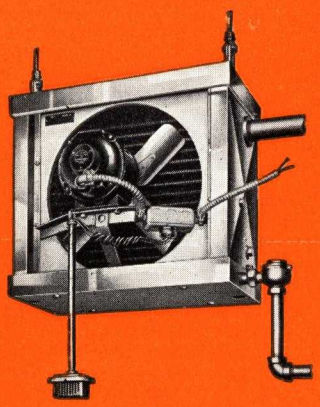
(Quan.) (Rod size) Fig. 140 Hanger Rods (Specify length from table below).

Model Numbers	20-20L 25-25L 30-30L	40-40L 45-45L 50-50L 60-60L	65-65L 70-70L 80-80L 90-90L	100-100L 110-110L 140-140L 180-180L
Hanger Rod Size	⅜"	½"	⅝"	⅞"
Correct Length of Hanger Rod	"B" minus 4½"	"B" minus 5½"	"B" minus 6½"	"B" minus 8"

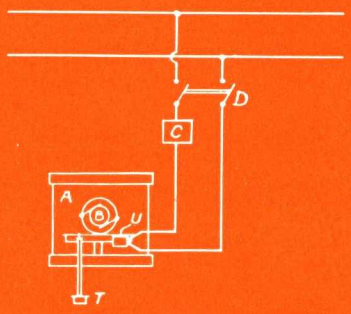


Front View

Thermostat



Rear View



AUTOMATIC THERMOLIER

SIMPLIFIED thermostatic temperature control of unit heaters is now available in standardized form for the first time in the Grinnell Automatic Thermolier.

This arrangement provides a simple, convenient, practical and economical method of room temperature control by individual control of each Thermolier. While primarily intended for applications requiring but a single Thermolier, it also offers installation savings in areas heated by two or more widely spaced Thermoliers which would normally be controlled by one thermostat.

The automatic attachment consists of a free swinging adjustable thermostat suspended from the motor bracket as illustrated above. The only wiring required is to run the service to the conduit box and plug in the twist lock cap. Each Automatic Thermolier is shipped with motor wired to the conduit box as illustrated.

The initial setting of the thermostat can be made either by personal comfort requirements or more accurately by readings of a thermometer located in the comfort or working zone. Once set, the thermostat need not be disturbed unless a different temperature is desired.

The Grinnell Automatic Thermolier can be furnished in Thermolier sizes as follows:—

Models 20 to 90 and 20L to 180L inclusive for 110 or 220 volts, single phase A.C.

Models 20 to 90 and 20L to 90L inclusive for 115 or 230 volts D.C.

When ordering these individually-controlled unit heaters specify "Automatic Thermolier," stating Model Number and electrical characteristics.

A—Thermoliers.

B—Thermolier Motors.

C—Thermal Overload Cut-outs (Recommended).

D—Double Pole Switches.

T—Grinnell Automatic Thermostat.

U—Conduit Box.

THERMOLIER

de luxe type

★

THERMOLIER *de luxe type*

FRONT VIEW OF THERMOLIER De LUXE TYPE . . . note modern design, and louver construction for better heat distribution, and the non-reflecting finish of art metal slate gray and satin chrome.

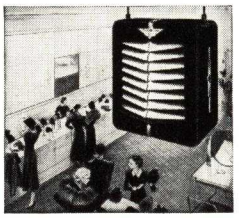
SIDE VIEW . . . the specially-designed motor is recessed within the housing, as is the thermostatic trap.

REAR VIEW . . . inlet and outlet pipe connections have been moved to the rear *inside of the housing* . . . from any side, Thermolier de luxe type looks well.

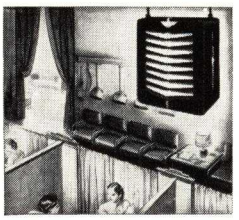
SPECIAL FEATURES

of the THERMOLIER *de luxe type*

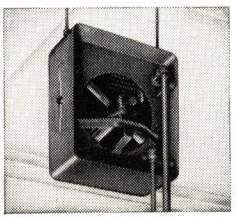
de luxe **HOUSING** . . . created by leading industrial designers to harmonize with the appointments of modern stores, restaurants, shops and offices.



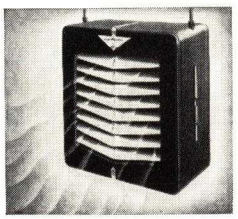
de luxe **COLOR SCHEME** . . . combining art metal slate gray with non-reflecting satin chrome . . . lends itself to any color motif, yet remains a background part of the decorative scheme.



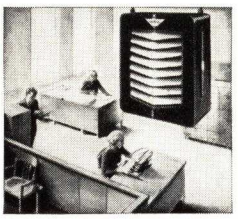
de luxe **CONSTRUCTION** . . . the same fourteen points of superiority that have maintained Thermolier's leadership in unit heating, *plus recessed motor and concealed inlet and outlet pipe connections inside of housing in rear, out of sight.*



de luxe **HEAT DISTRIBUTION** . . . entirely new louver design gives wider angular spread of heat for greater effective area of coverage with same efficient downward delivery.



de luxe **OPERATION** . . . "lazy water" eliminated by the time-proven, built-in cooling leg in conjunction with especially engineered fan and motor to ensure most efficient operation.



★ *The heating element and the entire internal construction of Thermolier de luxe type is identical with the time-tested Factory and Industrial type Thermoliers, assuring the peak of Unit Heater efficiency, performance and reliability.*

CAPACITIES *of the* THERMOLIER *de luxe type*

WHEN RUN AT NORMAL SPEEDS

All based on Standard Basis of Rating (2 lbs. Steam Pressure and 60° Entering Air Temperature).

Note: For Capacities at other Pressures and Temperatures, see Conversion Table, page 28.

Models	R.P.M. at Normal Speeds	Total Heat delivered, B.t.u. per hr.	Equivalent Direct Radiation E.D.R.	C.F.M. (70° F. Vol.) at 60° F. Enter. Air	C.F.M. at Exit Air Temp.	Exit Air temp., ° Fahr.	Condensation, lb. per hr.	Air Velocity at Exit—Linear Ft. per Min.	
								Louvers Wide Open	Louvers Set at 45°
20	**1750**	**35,000**	**146**	**599**	**646**	**114**	**35**	**955**	**1192**
20L	1150	26,900	112	406	438	122	28	648	811
25	**1750**	**40,500**	**169**	**617**	**685**	**120**	**42**	**1012**	**1265**
25L	1150	30,900	128	427	475	127	32	703	880
30	**1750**	**47,800**	**199**	**506**	**579**	**147**	**49**	**858**	**1072**
30L	1150	35,200	147	345	395	156	37	584	730
40	**1750**	**69,400**	**289**	**1475**	**1566**	**104**	**72**	**1051**	**1420**
40L	1150	53,300	222	954	1030	112	56	692	935
45	**1750**	**81,200**	**339**	**1792**	**1810**	**105**	**84**	**1214**	**1640**
45L	1150	62,600	261	1107	1196	113	66	803	1182
50	**1750**	**90,700**	**378**	**1661**	**1794**	**111**	**93**	**1202**	**1628**
50L	1150	67,100	280	1084	1182	118	70	795	1172
60	**1750**	**104,800**	**437**	**1267**	**1424**	**137**	**108**	**956**	**1291**
60L	1150	77,700	324	817	938	148	81	629	850
65	**1150**	**129,500**	**540**	**2170**	**2356**	**115**	**134**	**810**	**1092**
65L	850	110,100	459	1630	1792	123	114	617	834
70	**1150**	**142,000**	**592**	**2312**	**2895**	**109**	**147**	**995**	**1341**
70L	850	117,000	490	1722	2160	114	122	743	1020
80	**1150**	**164,600**	**686**	**2623**	**2884**	**117**	**171**	**992**	**1339**
80L	850	139,300	580	1932	2180	125	143	749	1028
90	**1150**	**189,200**	**788**	**2016**	**2298**	**144**	**196**	**789**	**1063**
90L	850	151,600	632	1475	1702	152	156	586	791

RECOMMENDATIONS

1 For Maximum B.T.U. Capacity per Unit of Electric Consumption . . . . . Use Models 30, 60, 90.

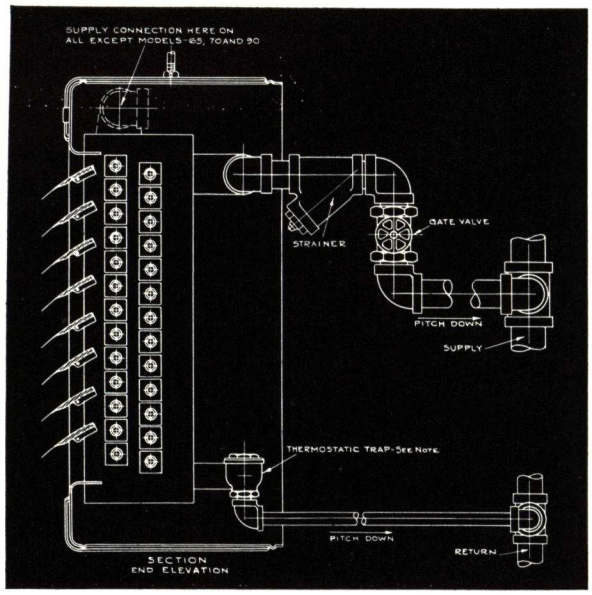
2 For Maximum Normal Velocity . . . . . Use Models 20, 25, 30, 40, 45, 50, 60, 65, 70, 80, 90.

3 For Lowest Outlet Temperatures (Usually used when steam pressures are high) . Use Models 20, 25, 40, 45, 50, 65, 70, 80.

4 Where Quietness of Operation and Low Velocity are requisite . . . . . Use Models 20L, 25L, 30L, 40L, 45L, 50L, 60L, 65L, 70L, 80L, 90L.

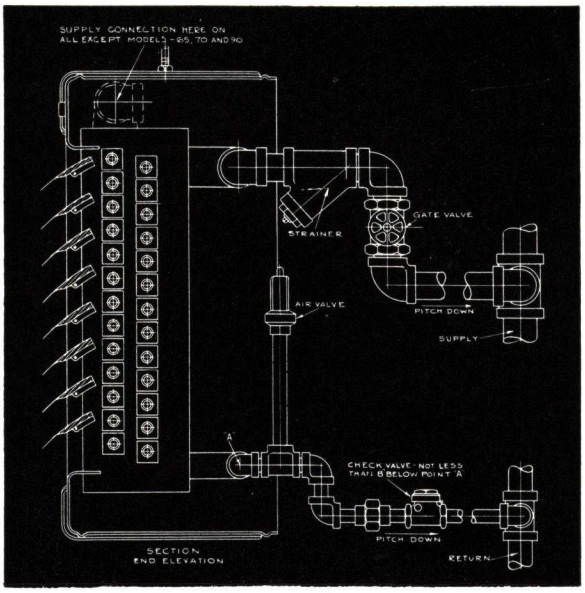
PIPING CONNECTIONS (Typical)

of the THERMOLIER de luxe type



For Vacuum or Vented Return Gravity Systems

Note: On Models 30 and smaller use R.H. Corner Pattern Trap.



For Closed Return Gravity Systems

CONVERSION TABLE

Constants for Determining the Capacities of Thermoliers for Various Steam Pressures and Temperatures of Entering Air. *(Based on Steam Pressure of 2 lbs. Gage and 60° Entering Air Temperature.)*

To determine Capacity at any Steam Pressure and Entering Air Temperature, multiply Rated Capacity at 2 lbs. Steam Pressure and 60° Entering Air Temperature by Constant from Table below.

Example: Required to find the Capacity of Model 90 Thermolier at 30 lbs. Steam Pressure and 80° Entering Air Temperature. Multiply Capacity of Model 90 at 2 lbs., 60° (189,200 B.t.u.) by Constant (1.19). 189,200 B.t.u. × 1.19 = 225,148 B.t.u.

STEAM PRESSURE Pounds—Gage	Temperature of Entering Air—Degrees Fahr.											
	—10°	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°	100°
0	1.54	1.45	1.37	1.27	1.19	1.11	1.03	0.96	0.88	0.81	0.74	0.67
2	1.59	1.50	1.41	1.32	1.24	1.16	1.08	1.00	0.93	0.85	0.78	0.71
5	1.64	1.55	1.46	1.37	1.29	1.21	1.13	1.05	0.97	0.90	0.83	0.76
10	1.73	1.64	1.55	1.46	1.38	1.29	1.21	1.13	1.06	0.98	0.91	0.84
15	1.80	1.71	1.61	1.53	1.44	1.34	1.28	1.19	1.12	1.04	0.97	0.90
20	1.86	1.77	1.68	1.58	1.50	1.42	1.33	1.25	1.17	1.10	1.02	0.95
30	1.97	1.87	1.78	1.68	1.60	1.51	1.43	1.35	1.27	1.19	1.12	1.04
40	2.06	1.96	1.86	1.77	1.68	1.60	1.51	1.43	1.35	1.27	1.19	1.12
50	2.13	2.04	1.94	1.85	1.76	1.67	1.58	1.50	1.42	1.34	1.26	1.19
60	2.20	2.09	2.00	1.90	1.81	1.73	1.64	1.56	1.47	1.39	1.31	1.24
70	2.26	2.16	2.06	1.96	1.87	1.78	1.70	1.61	1.53	1.45	1.37	1.29
75	2.28	2.18	2.09	1.99	1.90	1.81	1.72	1.64	1.55	1.47	1.39	1.32
80	2.31	2.21	2.11	2.02	1.93	1.84	1.75	1.66	1.58	1.50	1.42	1.34
90	2.36	2.26	2.16	2.06	1.96	1.88	1.79	1.71	1.62	1.54	1.46	1.38
100	2.41	2.31	2.20	2.11	2.02	1.93	1.84	1.75	1.66	1.58	1.50	1.42
125	2.51	2.39	2.30	2.20	2.13	2.03	1.93	1.85	1.77	1.68	1.60	1.53

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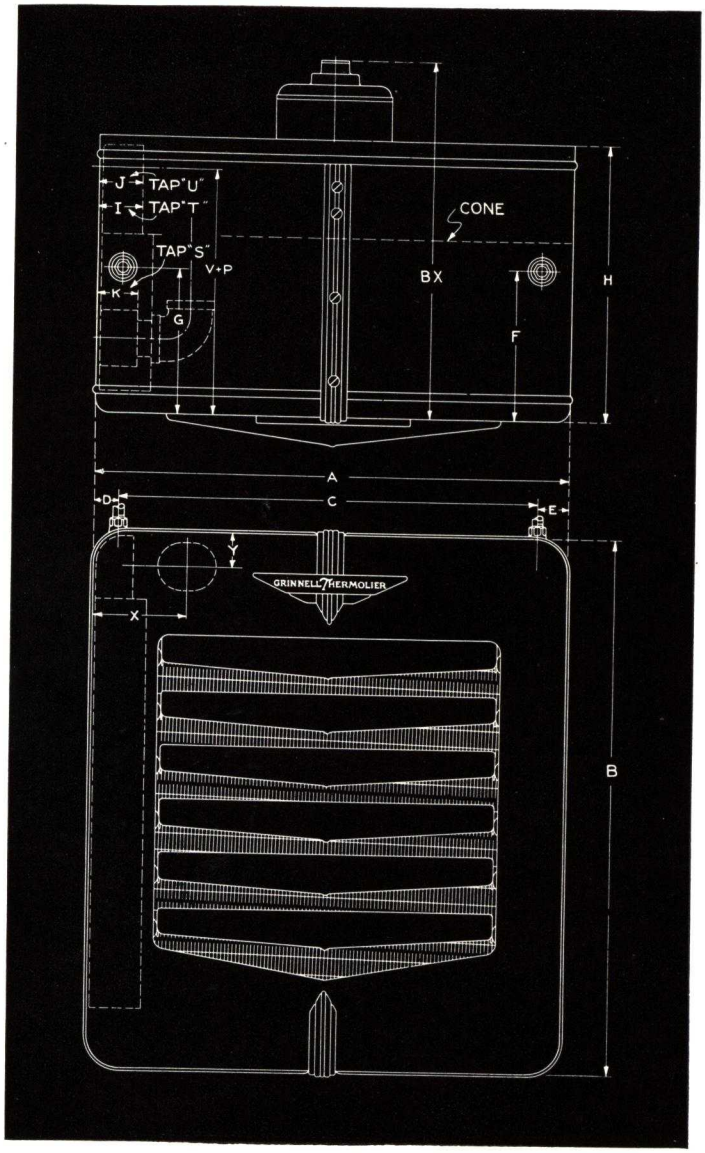
DIMENSIONS *of the*

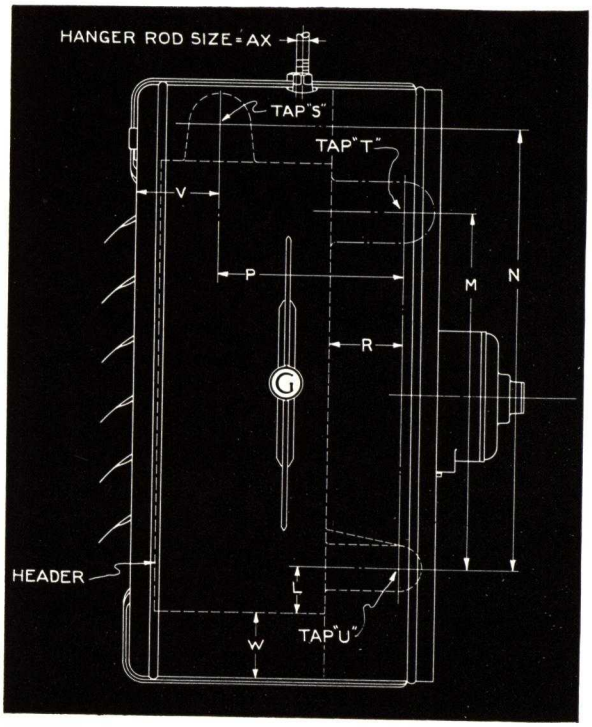


THERMOLIER

de luxe type

125 LBS. MAXIMUM

WORKING STEAM PRESSURE



Models	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	R	S	T	U	V*	W	X*	Y*	AX	B*
20 to 30 Incl.	16 1/8	17 15/16	13 7/16	1 11/32	1 11/32	6	5 7/8	11	....	....	....	....	....	....	....	....	....	....	....	2 3/4	2 1/4	4 1/8	17/16	3/8	14 1/8
	Mod. 20, 20L, 30, 30L Steam								....	1 3/4	1 3/4	1 1/8	....	13 1/8	7 3/16	3	1	....	1/2	....	....	....	....	....	....
	Mod. 25, 25L Steam								....	1 3/4	2 1/4	1 3/4	....	12 1/2	7 3/16	3	1	....	1/2	....	....	....	....	....	....
	Mod. 20, 20L, 30, 30L Hot Water								....	1 3/4	1 3/4	1 3/4	....	12 1/2	6 7/16	2 1/4	3/4	....	3/4	....	....	....	....	....	....
	Mod. 25, 25L Hot Water								....	1 13/16	2 1/4	1 3/4	....	12 1/2	6 7/16	2 1/4	3/4	....	3/4	....	....	....	....	....	....
40 to 60 Incl.	21 1/2	24 1/8	19	1 1/8	1 3/8	6 3/4	6 1/2	12 1/2	....	....	....	....	....	....	....	....	....	....	....	3 3/8	2 5/8	4 1/4	1 9/16	1/2	16 5/8
	Mod. 40, 40L, 45, 45L, 60, 60L Steam								....	1 3/4	1 13/16	1 15/16	....	18	7 7/8	3	1 1/2	....	3/4	....	....	....	....	....	....
	Mod. 50, 50L Steam								....	1 15/16	1 13/16	2 1/4	....	17 11/16	7 5/8	3	1 1/4	....	3/4	....	....	....	....	....	....
	Mod. 40, 40L, 45, 45L, 60, 60L Hot Water								....	1 13/16	1 13/16	1 15/16	....	18	7 5/8	3	1	....	1	....	....	....	....	....	....
	Mod. 50, 50L Hot Water								....	1 15/16	1 13/16	2 1/4	....	17 11/16	7 5/8	3	1	....	1	....	....	....	....	....	....
65 to 90 Incl.	27 1/2	32	24 3/4	1	1 3/4	7	7	15	....	....	....	....	....	....	....	....	....	....	....	3 1/2	3 1/16	4 7/8	1 3/4	5/8	19 1/4
	Mod. 65, 65L, 70, 70L, 90, 90L Steam								1 5/16	1 5/16	....	1 29/32	20 25/32	....	....	3 1/2	....	2	3/4	....	....	....	....	....	....
	Mod. 80, 80L Steam								....	1 5/16	2 7/16	2 3/16	....	25 1/16	8 19/32	3 1/2	1 1/2	....	3/4	....	....	....	....	....	....
	Mod. 65, 65L, 70, 70L, 90, 90L Hot Water								1 5/16	1 5/16	....	2 1/4	20 3/4	....	....	2 7/8	....	1 1/4	1 1/4	....	....	....	....	....	....
	Mod. 80, 80L Hot Water								....	1 5/16	1 5/16	2 1/2	....	24 3/4	7 17/32	2 7/16	1 1/4	....	1 1/4	....	....	....	....	....	....

* Vary Slightly

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THERMADOR ELECTRICAL MANUFACTURING CO.

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LOS ANGELES, CALIF.

Third and Madison Streets
OAKLAND, CALIF.

REPRESENTATIVES IN PRINCIPAL CITIES

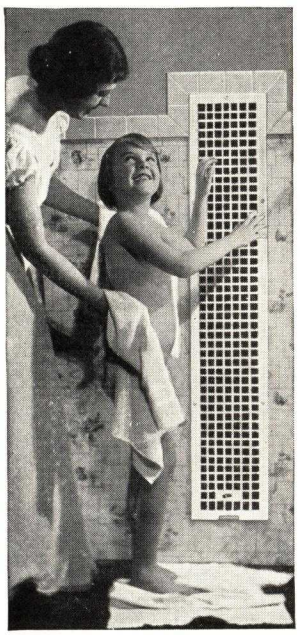
THERMADOR—MODERN ELECTRIC HEATERS

THE LONG RADIANT THERMADOR

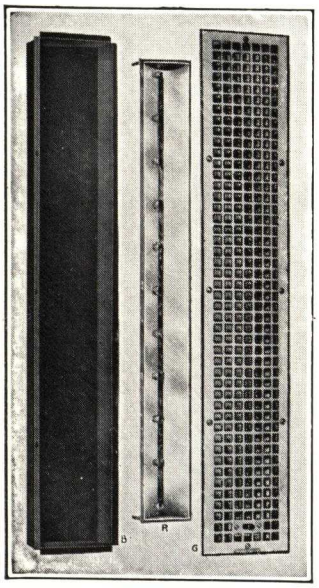
"Radiant Heat from Head to Heels"

This proven development in quick bathroom heating is logically shaped to utilize wall space to greatest advantage and to flood the lower portion of the room with quick, steady heat. *It is only 9 inches wide and 48 inches tall.*

The exceedingly limited width permits placement of this new Thermador in wall spaces formerly too narrow for the installation of any heater. Its unusual height radiates the heat exactly where it is needed—"from head to heels."



Being a Thermador, this modern heater is a quality product in every detail. The grille (G) is of steel, finished in high-grade heavy chromium plate. The reflector (R) is of chromium plated steel and it holds the nickel-chromium heating unit by special ceramics. This assembly is fastened to the grille at the factory. The wall box (B) is of steel, black enameled and furnished with sufficient knockouts. It is shipped separately.



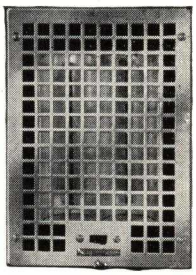
All heaters are equipped with a switch on the grille: double-pole on the 230-volt heaters, and single-pole on the 115-volt heaters.

The grille measures 9x48x1/4 inches; the wall box 7 1/8x46 1/8x4 inches. Shipping weight of heater assembly, 10 pounds; of wall box, 11 1/4 pounds.

Catalog No.	Watts	Volts
LR 161	1650	115
LR 162	1650	230
LR 202	2000	230

THE RADIANT CONVECTION THERMADOR

This heater with its improved features is specially designed for bathrooms, small bedrooms, breakfast rooms, etc., of 700 cubic feet or less. It not only gives a quick initial heat but maintains a comfortable temperature. Where minimum cost is of prime consideration, this Radiant Convection Thermador is recommended.



The Radiant Convection Thermador

To insure maximum reflection and long years of service, the heater of this Thermador has a double reflector of aluminum treated by Adnactic process. Flush steel grille is chromium plated. Switch is special heater type.

Grille measures only 12 x 17 1/4 x 3/8 inches; wall can, 10x15x4 inches. Shipping weight of heater 4 1/2 pounds; of wall can, 4 1/2 pounds.

Catalog No.	Watts	Volts
1250	R-121	115
1500	R-151	115

THE FAN TYPE THERMADOR

For unusually quick heating of rooms, both small and large, we recommend this wall insert Thermador with fan. This heater embodies the latest scientific principles of fan circulation—and thus assures continuous movement of the warm air in the *living zone of the room.* At a flip of the switch this Thermador floods the room with warmth. There are no preliminary or generating steps. Cold spots are eliminated. The fan may be used in summer without the heat.

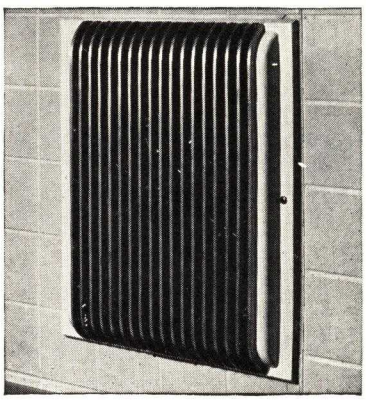
Standard finish of frame and grille is white, ivory or statuary bronze, with baked wrinkle finish; or with prime coat to be painted on job to match wall finish.

Motor is induction type, specially built with 16-blade aluminum fan. The heater is equipped with thermostatic cutout approved by Underwriters' Laboratories, Inc.

Grille size on B type, 13 7/8x17 1/4 inches. Wall box, 12 1/2x15 3/4x4 inches.

Grille size on W type, 15 3/4x20 1/4 inches. Wall box, 14x18 7/8x4 inches.

Catalog No.	Watts	Volts (a.-c.)
B 161 M	1650	115
B 202 M	2000	230
B 252 M	2500	230
W 302 M	3000	230
W 402 M	4000	230
W 502 M	5000	230



The Fan Type Thermador

MEMORANDA

YOUNG RADIATOR COMPANY

Manufacturers of Heating and Cooling Surfaces

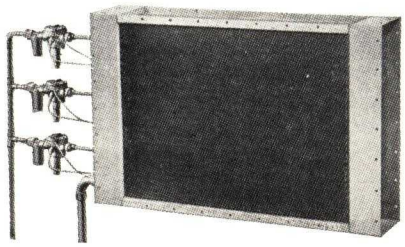
RACINE, WIS.

SALES AND ENGINEERING OFFICES IN ALL PRINCIPAL CITIES

Streamaire Copper Convectors

This line includes 6 distinct types of cabinet enclosures: free standing cabinets, wall-hung cabinets, partially recessed cabinets, fully recessed cabinets, bathroom cabinets, and plastered-in enclosures. All models incorporate the Streamaire principle using large elliptical tubes in the heating element which makes Young the ideal installation for one-pipe steam, two-pipe steam, vapor, vacuum, or hot water systems.

Request catalog No. 4037 for capacities and full description.

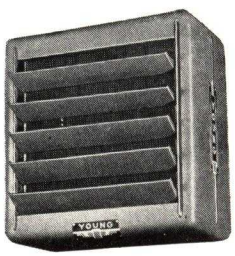


Young Evaporators

For direct expansion systems using Freon or Methyl chloride.

This line is complete; there are 5 groups, 11, 17, 23, 29 and 35-in. widths, and lengths from 1 ft. 8½ in. to 10 ft. 8½ in. Tubes in each width are grouped in circuits having a common manifold which distributes liquid equally to each tube. The distributor inserted in each manifold is of such design that the common manifolds in turn can be grouped and supplied by one expansion valve.

Request catalog No. 535 for additional information.



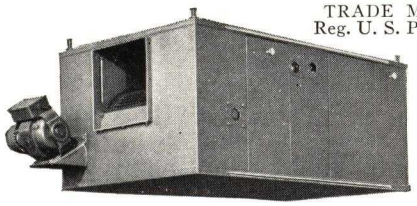
Young Unit Coolers

A complete new line of suspended units consisting of nine models varying in capacities from .39 to 2.0 tons of refrigeration. Designed for use with water, brine, or any common refrigerant.

Request catalog for full details.

Young Quality

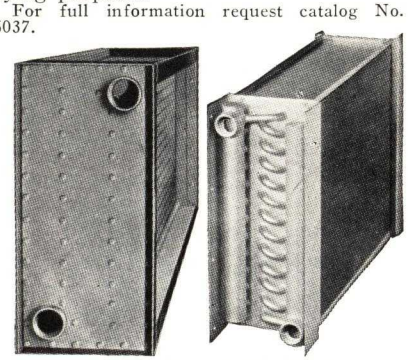
TRADE MARK
Reg. U. S. Pat. Off.



Young Air Conditioning Units

These units are made in 4 physical sizes with two fan speeds for each size. Designed for heating, cooling, humidifying, dehumidifying, air filtration, air circulation, and ventilation; they do a real air conditioning job. When so specified units may be purchased for cooling only or merely for heating and humidifying purposes.

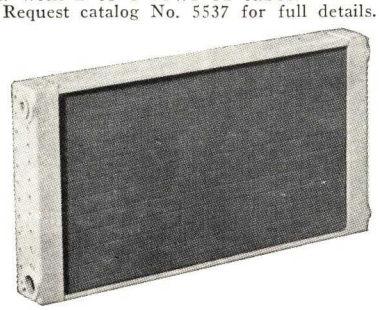
For full information request catalog No. 6037.



Coils for Cooling With Water or Brine

Continuous tube coils—coils with removable headers; both types designed for counterflow of the liquid and air, utilizing the utmost cooling capacity; making low air temperatures possible with relatively high water temperatures or slight difference between air and water temperatures. Available in widths from 11 to 35 in., lengths from 1 to 10 ft. with 2 to 8 rows of tubes.

Request catalog No. 5537 for full details.



Commercial Heat Transfer Units

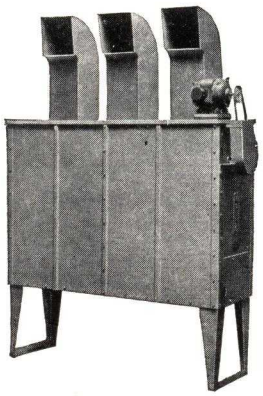
Designed for use in connection with heating, cooling and air conditioning units where a compact, efficient heat transfer surface is required. Units range from 6 to 30-in. widths and from 11 to 65 in. in length and are made with one or two rows of tubes deep.

See catalog No. 4536 for further information.

Young Unit Heaters

A new, complete line handsomely designed and scientifically engineered. 28 different models meet the heating requirements in all types of buildings. Both single and double fan units, suspended type, varying in capacities from 18,000 to 658,000 B.t.u. per hour. All Young Unit Heaters are guaranteed for working pressures up to 150 lbs. gauge pressure saturated steam.

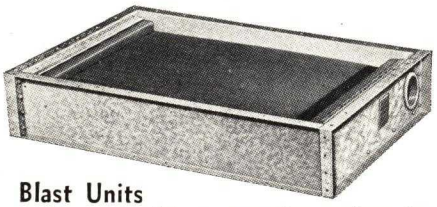
Request catalog No. 2537 for capacity tables and engineering information.



Young Floor Type FH Unit Heaters

There are 10 models of Young Floor Type Unit Heaters for use with steam pressures up to 150 lbs. and ranging in capacities from 120,000 to 800,000 B.t.u. per hour. These units are also manufactured without legs and arranged for horizontal or vertical ceiling suspension. FH unit heaters have 2, 3, or 4-blower type fans depending on size of units.

See catalog No. 336 for further information.



Blast Units

An encased heat transfer surface for use in connection with forced air heating or cooling systems. Casings around units make it easy to bolt them to the duct work either in single or multiple units.

Request catalog 4536 for full information.

BARBER-COLMAN COMPANY

Manufacturers of Automatic Electric Controls for Temperature, Humidity and Industrial Applications

ROCKFORD, ILL.

For our pages on Uni-Flo Grilles and Registers and Garage Doors and Electric Door Operators, see File Index

BARBER-COLMAN ELECTRIC SYSTEM OF TEMPERATURE AND HUMIDITY CONTROL

The Barber-Colman Electric System of Temperature and Humidity Control is adaptable to any kind of heating, ventilating, air conditioning system, manufactured unit, or industrial application where temperature and humidity are to be controlled. A system may be either automatically controlled or manually operated from remote switches, or by combinations of both.

All units are electrically operated, and all connections between units are electrical. Because of the low voltage employed, 25 volts, standard thermostat wire can be used. This greatly facilitates the installation in either new or existing buildings.

All Motor-Operated Valves and Damper Control Motors are powered by the Barcol shaded pole induction motor, which has only one moving part, and requires no attention, except occasional oiling. The oil-immersed models require no attention.

The only auxiliary equipment required for operation of the Barber-Colman Electric System is a transformer.

Barber-Colman Controls are precision built to insure long, continuous, and dependable service. They are easy to install and service, or to replace if necessary on account of accidental damage. They are listed as standard by the Underwriters' Laboratories, Inc.

TYPICAL UNITS OF CONTROL APPARATUS

Thermostats

Single Temperature Thermostat — For wall mounting in spaces which are to be maintained at usual room temperatures. Detents, small permanent magnets, are available in most types. They provide snap action movement of the tongue from one contact to the other and prevent chattering. They also permit the use of the thermostat in 2-wire, as well as 3-wire circuits.

Two-Temperature Thermostat—For maintaining one temperature for part of the time, and a different temperature for the rest of the time without changing the setting of the thermostat; e.g., Day and Night, or Summer and Winter control. The control may be shifted from one element to the other by using the lever at the top of the case, or the control may be shifted on a number of thermostats simultaneously by an automatic time switch (or manually operated switch) from a remote point.

Duplex Thermostat—For controlling two separate units of heating equipment or heating and cooling equipment; e.g., one element may be set at 72 F. to control the heating equipment, and the other element set at 78 F. to control the cooling equipment. Similar to Two-Temperature Thermostat, except they do not have the magnetic shifting mechanism. The control circuit may be shifted from one element to the other by a time switch (or manually operated switch) from a remote point.

Insertion and Immersion Thermostats—Have their sensitive elements arranged so that they may be inserted into the path of air, or immersed in the liquid to be controlled. A perforated tube guard is furnished to protect the element when the thermostat is to be used in a duct, or a closed tube guard for immersion in liquids, or when it is to be exposed to excessive moisture or corrosive vapors.

The case enclosing the contacts is made of bakelite and all contacts and electrical connections are on the outside of the duct or pipe. They are available with either internal or external adjusting lever, and for control over various temperature ranges.

Air Stream Thermostats—(Not illustrated.) Have a long, tubular sensitive element which may be obtained in various lengths, so that when installed the sensitive element will extend across the entire duct; thus an air stream thermostat controls from the *average* temperature across the duct.

Thermostatic Adjuster

For control applications where it is desired to shift the control point of a thermostat or system in response to a change in some other temperature, usually outdoor temperature.

Potentiometer Type—Provides a means for automatic control of an air conditioning system, so that the indoor temperature in summer will vary gradually in accordance with changes in outdoor temperature, to maintain the most comfortable, healthful, and economical conditions. One Thermostatic Adjuster can change the control point of as many as eight thermostats. *Note:* Only room type Control Point Thermostats can be used with the potentiometer type Thermostatic Adjuster. A reversible motor shifts the contact points and arm of a potential dividing rheostat, in response to temperature changes of the bimetal element. Thus there is constant pressure between the movable arm and the resistance at all times, and full power is obtained over the entire range of the rheostat.

Switch Type—Provides a means for the automatic selection of a different circuit for different temperature ranges; as many as 21 circuits are available. As an example, used in the selection of different timing periods of a Cycler System to regulate the time a zone valve can be opened for corresponding outdoor temperature ranges. Similar to potentiometer type, except that a 21-point switch is used in place of the rheostat. A follow-up mechanism is powered by a reversible Barcol motor, which shifts the position of the contact points, and at the same time changes the position of the movable arm of a 21-point switch. Thus for every slight change in outdoor temperature there is a proportionate movement of the arm of the 21-point switch. This movement, however slight, is always positive, and permits full pressure on the switch points.

Hygrostats

Hygrostats are obtainable for either wall mounting or installation in ducts. The sensitive element of these instruments consists of a large number of human hairs, each hair being separately mounted, tensioned, and ventilated. These instruments have proven to be very sensitive, dependable, and particularly adaptable to the control of humidity in air conditioning systems.

Valves

Motor-Operated Valves—Motor-Operated Valves are made in sizes from ½ to 16 in., in standard valve body patterns and the following types: Packless, Single Disc Packed, Semi-Balanced, Full-Balanced, Pilot Piston, Three-way, Four-way, and Butterfly. The type and size of the valve body will, of course, be determined by the particular application. A motor driven mechanism or Valve Operator is available in both the positive (unidirectional) and throttling (reversible) type. All Operators are powered with the Barcol shaded pole induction motor, and are enclosed within a bakelite or metal cover. The oil-immersed Valve Operators have the operating mechanism enclosed within a die cast case similar to the Damper Control Motors.

Positive Type Valves—Operate only to the open and closed positions.

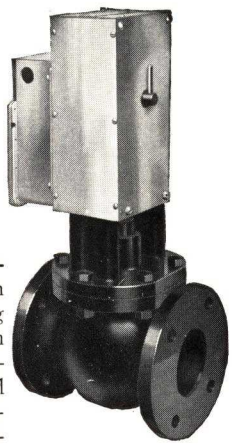
Throttling Type Valves—Can be operated in either direction and stopped or started from any intermediate position. The oil immersed valve operators of either the positive or throttling type are obtainable with or without an adjustable speed mechanism so that the speed of operation of the valve may be exactly suited to the individual installation to give the best results. Also both types may be equipped with auxiliary cam-operated switches so that additional equipment may be operated automatically at definite predetermined positions of the valve.

Radiator Valve—Packless type valve with YBa positive Motor Operator. The Valve Operators are very quiet and inconspicuous, and are used primarily on steam radiators, either exposed or concealed. They can also be used on low pressure (up to 10 lbs.) steam coils in small indirect radiation heating systems, and on processing units, such as automatic autoclaves, kettles, steam tables, steam cabinets, etc. Small valves of this type are widely used on various types of unit ventilators and other cabinet type heaters.

Packed Valve—For all kinds of water, steam, air, or gas lines carrying more than 10 lbs. pressure. These valves are powered with the YBa Motor Operator, and are used for positive service only. The motor operators on all Motor-Operated Valves are detachable as a unit. Valve bodies may be furnished with handwheels for manual operation prior to the time when the motor unit is to be installed. This is a distinct advantage on new installations.

Packed Single Seat Valve with fYBa Positive Motor Operator—This type of motor operator is more rugged and powerful, and permits use with higher pressures. Used on steam mains as in zone control, on heating coils of ventilating and air conditioning systems, etc. All Motor-Operated Valves may be controlled either automatically by thermostats, hygrostats, relays, time switches, etc., or by manually operated switches from a remote point.

Semi-balanced Valves with Reversible cYBf Motor Operator—(Left.) The reversible Barcol shaded pole induction motor may be stopped, then re-started in original direction, or reversed, to give proportioning service. Motor unit is enclosed in oil filled die cast metal case. External speed adjustment is provided so that speed of operation may be regulated on the job, to permit best operating results.

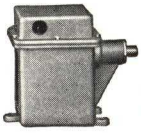


Line Valves with cYBc Motor Operator—(Right) Are used on large steam mains for either positive or throttling service. Valve bodies are available in standard patterns. These valves are particularly adapted to blast systems and zone control of large steam heating installations in commercial and public buildings, schools, office buildings, factories, hotels, hospitals, warehouses, and the like.

Solenoid Valves—May be had in sizes from ½ to ¾ in. for use with gas, water, oil, or refrigerants. These valves open when current is applied, and close by gravity and pressure when the current is cut off.

Damper Control Motors

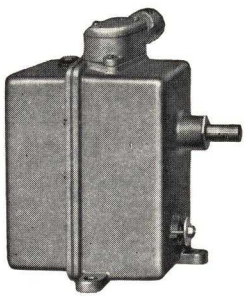
Damper Control Motors are made in three types, and a variety of sizes of each type. Each Damper Control Motor is powered by the Barcol shaded pole induction motor, which has only one moving part, and requires no attention, except occasional oiling. The oil immersed models require no attention. All oil immersed Damper Control Motors may be furnished either with or without an adjustable speed mechanism. Auxiliary cam-operated switches permit additional equipment to be operated automatically at definite predetermined positions of the damper.



Stall Type or Spring Return Damper Control Motors—Are constructed so as to run in one direction to a stall position when the power is on; and return in the opposite direction by means of an external spring or weight when the power is interrupted. Used with or without fusible link for operation of fire dampers. Also used to control small fresh air supply or exhaust dampers so that they open when the fan is on, and close when the fan is stopped.

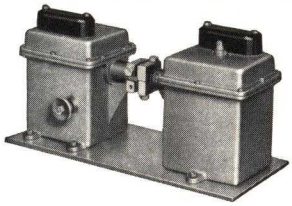
Oil Immersed Damper Control Motors—Available in either unidirectional or reversing types. These controllers are furnished either with or without an adjustable speed mechanism.

The reversible types may be stopped in any intermediate position, and restarted in either direction.



aYCk Damper Control Motor—May be furnished in either positive or reversible types, and with or without speed adjustment. These large reversible damper control motors are powered with two unidirectional Barcol motors, one motor used for each direction of rotation.

Program Switches—Are motor driven contact making mechanisms. They are available in a number of standard combinations, and may be built to order to give any special operating sequence. They may be used for shifting groups of two-temperature thermostats at different intervals, for controlling the operation of solenoid valves, relays, motor-operated valves, or compressors, in such a manner that they will open in any sequence with definite time intervals, and close in the same, or reverse sequence.



CONTROL SYSTEMS

The Micro Control System

Consists of Microtherm (left) with Microvalve or Microtrol. It solves the problem of control for a device which causes a rapid rate of change in temperature at the source, and which is to be controlled from a point where the rate of change in temperature is relatively low; e.g., control of unit ventilators, 3-way valves on chilled water supply lines, or a series of compressors.

Microtherm instantly proportions the operated device in accordance with the amount of the change in temperature. In other words, the effect of the change in temperature is anticipated, and an equilibrium of the controls is established, and "hunting" is positively prevented.

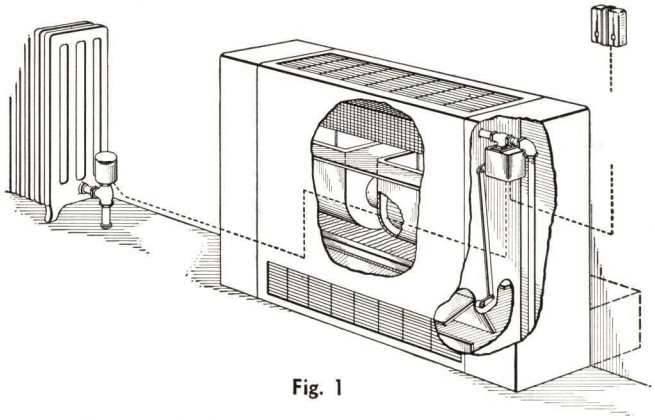


Fig. 1

Microvalve and Microtrol are identical in size with the corresponding oil immersed reversible Motor-Operated Valves or Damper Control Motors.

Fig. 1 illustrates a unit ventilator in which both the valve and mixing damper are regulated by a Microvalve controlled from a Microtherm. Auxiliary contacts in Microvalve are used to control Motor-Operated Valves on direct radiation.

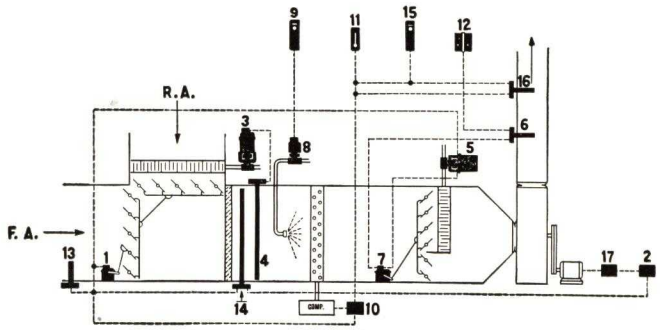


Fig. 2

Surface Cooler System

Fig. 2 represents a complete year-round air conditioning system. The shift from summer to winter operation is made automatically at any time. Thermostats (13) and (14) and Damper Control Motor (1) operate combination fresh air and recirculated air dampers to maintain a constant temperature of the air entering the system.

Fresh air damper automatically closes to a minimum position, admitting only enough fresh air for ventilation, whenever temperature of outside air rises above 65° F.

Hygrostat (9) controls operation of Solenoid Valve (8) to maintain sufficient humidity during winter operation. Hygrostat (15) operating in conjunction with Thermostat (16) controls the operation of the compressor to reduce the humidity for summer operation.

Microtherm (12), in conjunction with Low Limit Thermostat (6), proportions Microtrol (7) and positive Motor Operated Valve (5), to maintain desired temperature in the conditioned space.

Air Washer System

A complete air washer system using by-passed air for reheating is illustrated in Fig. 3. Damper Control Motor (1) positions fresh air damper according to a position selected by 5-Point Switch (15). Thermostat (4) operates Valve (3) on first preheater coil to prevent damage from freezing. Air-Stream Thermostat (13) controls operation of reversible Damper Control Motor (12), and Throttling Valve (14) to maintain a constant temperature of the fresh air. Microtherm (18), in conjunction with Low Limit Thermostat (6), controls the proportioning operation of Microtrol (16) and Microvalve (5) to maintain the desired temperature in the conditioned space.

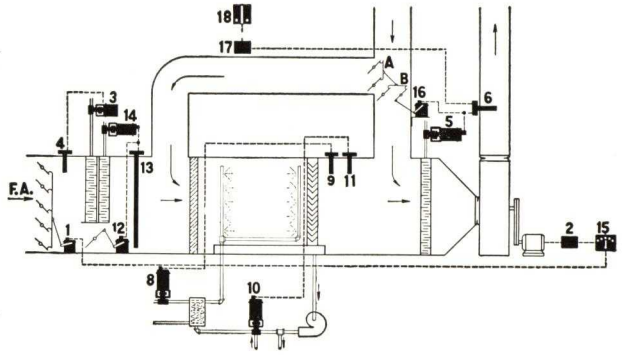


Fig. 3

Humidity is maintained in the conditioned space by controlling the dew point temperature of the air leaving the air washer. Thermostat (9) controls the operation of Throttling Valve (8) on the steam line to the indirect heater; Thermostat (11) controls the operation of throttling type Three-Way Valve (10) on the recirculated and chilled water supply lines.

Steam Jet Refrigeration System

Fig. 4 illustrates the control of a steam jet system which requires two steam valves for each booster unit. Each booster unit is controlled in the following manner:

Starting—Starting Valve (7) opens; running Valve (3) opens; Four-Way Valve (9) positions to operate hydraulic cylinder to open valve in evaporator; Valve (7) closes.

Stopping—Four-Way-Valve (9) positions to operate hydraulic cylinder to close valve in evaporator; Valve (3) closes.

Microtherm (1) maintains a constant temperature of the chilled water leaving the evaporator by controlling the operation of Program Switch (2), which in turn puts into operation the proper number of booster units.

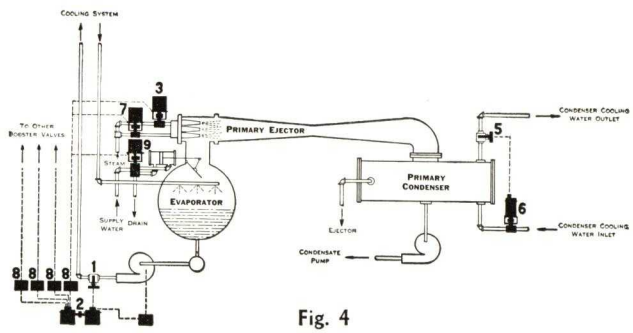


Fig. 4

Thermostat (5) controls the operation of throttling valve (6) to maintain a constant temperature of the water leaving the condenser.

To prevent any possibility of freezing in the evaporator relay (4) is wired in parallel with the pump motor, so that when the pump stops, Program Switch (2) is run to the "off" position, thereby closing all valves and shutting down all booster units.

Multi-Compressor Control

A 10-ton and 20-ton compressor are used for purpose of illustration. See Fig. 5.

Microtherm (1) controls Program Switch (3), and the operation of the compressors to maintain the desired room temperature.

The 20-ton compressor is connected to two separate sets of coils, one 15-ton capacity, and the other 5-ton capacity. Solenoid Valve (2) is installed on the liquid line to the smaller coil.

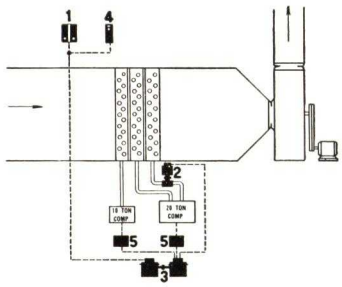


Fig. 5

Steps	Capacity available	10-ton compressor	20-ton compressor	Solenoid valve (2)
1st	10 tons	On	Off	Closed
2nd	15 tons	Off	On	Closed
3rd	20 tons	Off	On	Open
4th	25 tons	On	On	Closed
5th	30 tons	On	On	Open

The above table shows the sequence of operation and the five capacities available with this system.

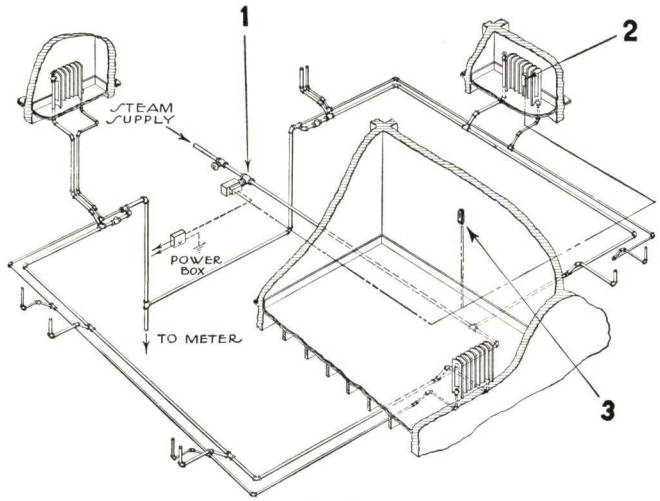


Fig. 6

Compensated Zone Control System

This system provides automatic temperature control under changing weather and occupancy conditions. Fig. 6 illustrates such a system with one Room Thermostat controlling the heat supply for a number of rooms or sections of a building. Briefly, the operation of the system is as follows:

Room Thermostat (3) calls for heat and Motor-Operated Valve (1) opens; temperature of the radiator rises, and contacts are made in Varitherm (2); heat anticipator in Room Thermostat is energized, causing it to call for less heat and close valve; valve closing, breaks heater circuit, allowing Room Thermostat to return to normal and repeat the sequence when required.

With this system the heat anticipator in the Room Thermostat is *not energized until the heating medium increases the temperature in the radiator.* The Varitherm operates on a change in temperature, rather than from a fixed temperature and thus the system automatically compensates for the heat losses from a building. These are exclusive Barber-Colman patented features.

Hot Water Storage Tank Control

Commercial Installations—Commercial installations for supplying hot water are usually controlled by a Thermostat on the tank and a Motor-Operated Valve on the steam line to the coils within the tank. The Barber-Colman Electric System permits placing the controls at the most desirable points, as it is not necessary to limit the distance between the Thermostat and the Valve.

Residential Installations—Hot water heating systems may be controlled as illustrated in Fig. 7.

Room Thermostat (5) controls Motor-Operated Valve (4) and the burner or stoker. On call for heat, valve opens, and the burner or stoker starts; on call for less heat, valve closes and burner or stoker stops.

Thermostat (1) controls the operation of the burner or stoker to maintain a minimum water temperature in the boiler. Thermostat (2) controls the operation of Motor-Operated Valve (3), to regulate the flow of water through the indirect heater.

Steam heating systems may be controlled in a similar manner, except it is not necessary to have Valve (4) on the riser.

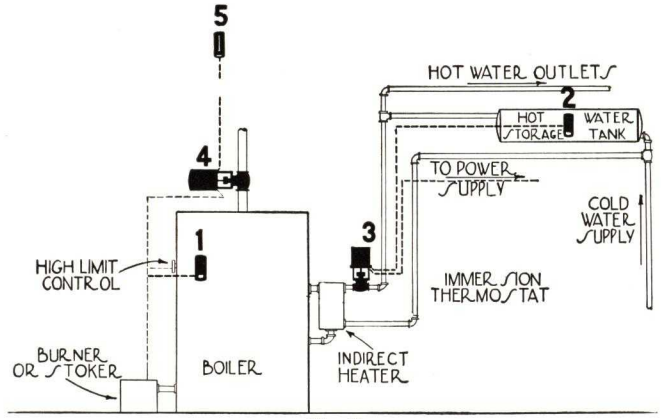


Fig. 7

Residential Air Conditioning System

Fig. 8 illustrates a typical residential year-round air conditioning system in which some rooms are heated by direct radiation.

Control of indirect part of System—Thermostats (1) control positive Damper Control Motors (3). Dampers operate so that they are always in either the full open or closed position.

Cooling Cycle—On call for cooling, dampers open; when all dampers are closed, compressor will stop. Any damper opening causes compressor to start.

Heating Cycle—Damper Control Motors (3) operate in reverse order of that described above; i.e., on call for heat, dampers open; on call for cooling, dampers close. Valve (4)

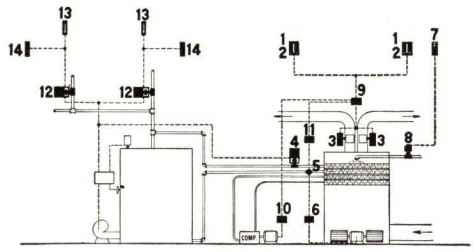


Fig. 8

is controlled from the auxiliary switches in Damper Control Motors (3); any damper opening causes valve to open.

Control of Direct Radiation—Thermostats (13) operate in conjunction with Variable Limit Thermostats (14) installed on the last radiator in each zone, to control the operation of its respective positive Valve (12).

Manual

A complete and detailed description of these and many other control systems is available in a bound manual, which will be furnished upon request. Consult a Barber-Colman representative or distributor in your territory, or write the factory for assistance on any control problem pertaining to heating, ventilating, air conditioning, or industrial applications.

MEMORANDA

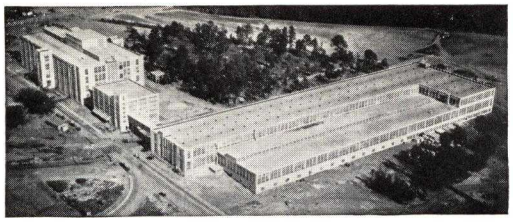
26
37

BARNES & JONES

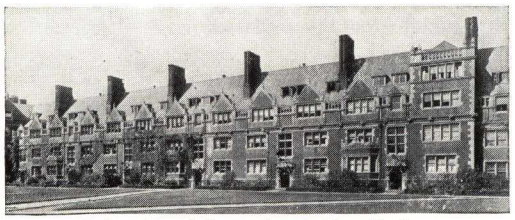
Systems of VAPOR VACUUM HEATING

B&J

BARNES & JONES INC.



Pacific Mills, Lyman, S. C.
Architects and Engineers—Lockwood, Greene and Co., Inc., Boston, Mass. Heating Contractors—Holyoke Valve & Hydrant Co., Holyoke, Mass., and Carrier Engineering Corp., Newark, N. J.



University of Pennsylvania Dormitories, Philadelphia, Pa.
Architects—Stewardson & Page, Philadelphia, Pa.

BARNES & JONES - - -

Designed by Manufacturers for Over Thirty Years of Apparatus for Accurately Controlling Vapor and Vacuum Heating Systems

Barnes & Jones' recognized success in providing adequate economical heating for all types of buildings is based on comprehensive experience with architects, heating engineers, building superintendents, plant engineers and owners. This fact is proved not only by the quality of the equipment itself, the carefully selected materials, and precision methods of manufacture, but also in the large number of notable installations and the many leading architects who continue to use Barnes & Jones' systems.

All Appliances Are Designed, Manufactured and Tested in Our Plant

Because the lowest final heating cost can be had only with the finest possible heating apparatus, Barnes & Jones manufactures only one quality of equipment—quality that assures long term, maintenance-free operation, quality that is never sacrificed. To protect users of Barnes & Jones equipment, to eliminate complaints and unnecessary servicing—every single piece of apparatus is tested and calibrated under actual working conditions before leaving the factory.

Complete Systems of Vapor Heating for All Types of Buildings

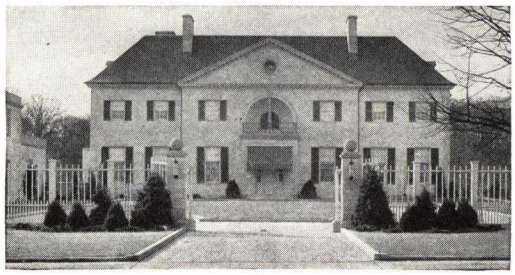
Barnes & Jones systems have been installed in modest homes, elaborate residences, office buildings, hospitals, schools, churches, theatres, industrial plants, hotels, public and semi-public buildings—proof of their ability to meet a wide range of exacting requirements accurately.

Facts to Consider Before Specifying a Heating System

The factors that make for lasting satisfaction and economy in a heating system are briefly as follows:

(1) Positive circulation of heat to every part of the apparatus, and immediate response to individual heating requirements.
(2) Partial or complete heating of individual radiators as needed.
(3) Freedom from water hammer in both radiators and piping.
(4) Elimination of air valves from radiators.
(5) Simple, accurate control by a supply valve of the heat in each radiator. Only one valve to operate.
(6) Economical operation.

When these factors are overlooked in favor of low initial cost, the result is a dollar and cents penalty that accumulates for as long as the system is in operation.



Japanese Embassy, Washington, D. C.
Architects—Delano and Aldrich, New York, N. Y.
Heating Engineers—Alfred J. Offner, New York, N. Y.
Heating Contractors—Standard Engineering, Washington, D. C.

Park Square Building, Boston, Mass.
Architects and Engineers—Densmore, LeClear & Robbins, Boston, Mass. General Contractors—W. A. and H. A. Root, Boston, Mass.

LEADING ARCHITECTS WHO HAVE SPECIFIED BARNES & JONES SYSTEMS

B. G. Goodhue Associates
Warren & Wetmore
Allen, Collens & Willis
Parker, Thomas & Rice
Coolidge, Shepley, Bulfinch & Abbott
Walker & Gillette
Delano & Aldrich
Shepard & Stearns
York & Sawyer
Jens Frederick Larson
Max H. Westhoff
Wm. T. Aldrich
Albert Kahn, Inc.
Cram & Ferguson
Crow, Lewis & Wick
Dwight James Baum
John Russell Pope

BARNES & JONES INCORPORATED

128 BROOKSIDE AVE. ● JAMAICA PLAIN, BOSTON, MASS.

REPRESENTATIVES IN PRINCIPAL CITIES

SYSTEMS FOR VAPOR AND VACUUM HEATING

Operating Principle of Barnes & Jones Vapor Heating

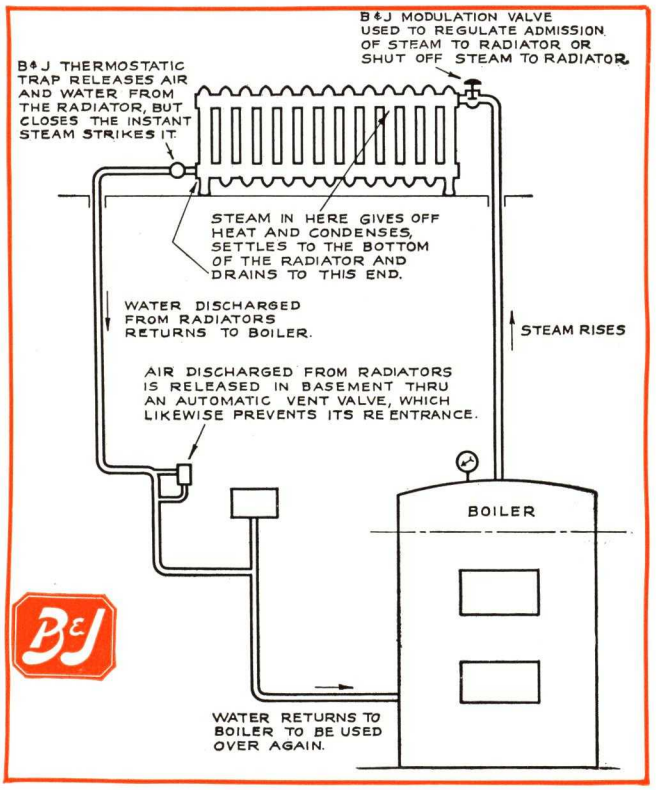
With the Barnes & Jones system of vapor heating, the return side of the system is vented to the atmosphere, with provisions made to prevent the readmission of air. This means that the return side at all times is never above atmospheric pressure, and at times a partial vacuum exists. If, for example, there is a gage pressure of only a few ounces in the boiler, it creates a definite, positive tendency to establish a circulation from the supply to the return side of the system.

Thus the steam entering the piping cannot build up a back pressure in the system to slow down its passage into the radiators.

Moreover, operating on a small pressure differential, the system provides practically instant response to heating requirements in all parts of the building. Simple and positive control of heat at each radiator is afforded by modulation valves. Thermostatic return traps prevent the passage of steam until it has given up its heat and condensed. Air and condensate are passed freely, from the radiators to the return piping, the water returning by gravity to the boiler, the air being vented in the basement.

Correctly proportioned orifices on each radiator are furnished when desired to assure uniform distribution of heat to all parts of the system.

Thus the last radiators on the line heat up as rapidly as those nearest the boiler. Steam is distributed according to actual needs minimizing waste—eliminating complaints.



FUNCTION OF THE APPARATUS

In brief, the operation of Barnes & Jones heating systems depends upon the following items:

Modulation Valves—permit control of heat at each radiator according to actual needs.

Orifices—when furnished with modulation valves insure uniform steam distribution throughout the system.

Thermostatic Traps—allow free discharge of air and water of condensation from radiators but prevent passage of steam.

Thermostatic Drip Traps or blast traps—allow removal of air and condensate from the supply main.

Vent Trap—installed at the end of return main, vents to the atmosphere the air discharged from radiators into the return side of the system, and prevents readmission of air to the system, thus, at times, establishing a vacuum on the entire system.

Condensator—insures positive return of water of condensation to boiler under varying pressure conditions. Pressure or vacuum on the system is indicated by a compound gage.

ADVANTAGES OF THE B & J VAPOR SYSTEMS

Quick Response to Heating Requirements

Because of the absence of back pressure on the return side of the system, steam is delivered to the radiators more rapidly than is possible with other types of steam systems, thus permitting a quicker response to heating needs. Steam passes into the radiators just as soon as a few ounces pressure is created in the boiler.

Noise-free Circulation

Water hammer is completely eliminated because at no time does steam come in contact with water in the piping. Condensate from radiators does not drain back into the supply lines, and thermostatic traps prevent the admission of steam to the return side of the system. Absence of air valves prevents the danger of discharging steam or water on rugs, floors, draperies, or furniture.

Economy of Operation

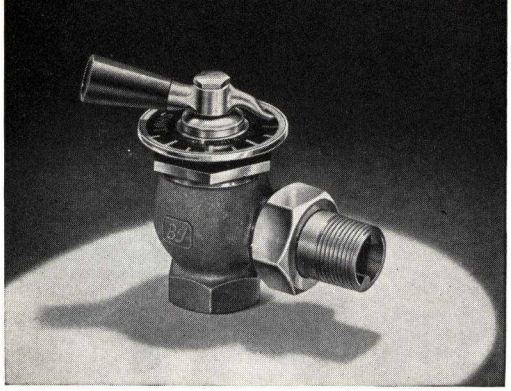
Since the system permits extremely rapid and efficient response to heating needs, fuel consumption can at all times be kept in close adjustment with actual requirements. This practically eliminates overheating and reduces fuel wastage.

Balanced Distribution

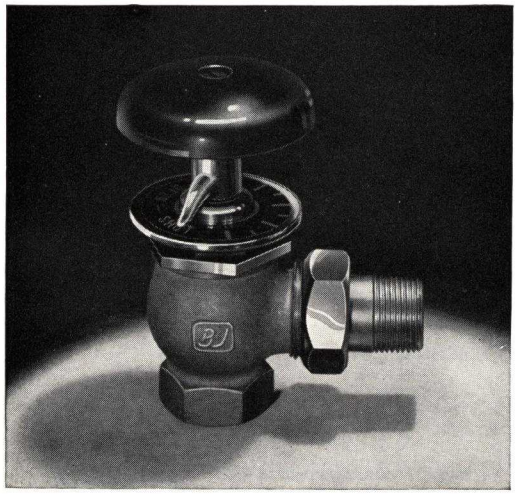
In all types of heating systems there is a tendency for the first radiators on the line to heat quickly, and for the last radiators on the line to heat slowly. With properly proportioned orifices in the radiator supply valves of a Barnes & Jones system, the heat is evenly distributed and balanced throughout the building—the last radiators on the line will heat equally as fast as the first.

Adaptability to Air Conditioning

Barnes & Jones Systems are well adapted for use in conjunction with air conditioning equipment, where steam is used as the heating medium. These systems provide a sound basis of economical heating and are recommended for use on those installations where air conditioning is used in combination with direct or convector radiation. In many cases a much more satisfactory result is obtained than is possible with many of the so-called air conditioning systems.



B&J Lever Handle Modulation Valve



B&J Wheel Handle Modulation Valve

BARNES & JONES TYPE "K" MODULATION VALVES

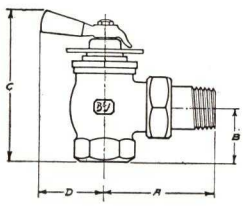
and Type "F" Packless Quick-Opening Valves

The Type "K" modulation valve regulates the admission of steam to the radiator. The valve as shown has easy-to-read graduations on a large non-tarnishable dial. The valve can be completely opened or closed in less than a full revolution of the handle. Can also be furnished in lock shield model, or with wheel handle and indicating dial, or for chain operation.

The Type "F" packless valve is recommended for use in residences, public and semi-public buildings where a moderate priced quick opening valve is required. Less than one complete turn of the handle will open or close the valve. This feature plus the advantages of the permanently packed stem and renewable disc seat have resulted in the use of the Type "F" in many industrial plants.

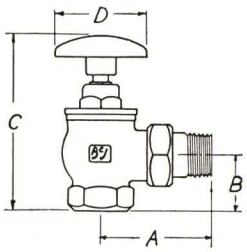
Both the Type "K" and Type "F" have large unobstructed passages to prevent trouble from scale and dirt, and when the valves are fully opened, they have a free area practically equal to that of the connecting pipe. The valve bodies are constructed of the best composition steam metal, heavily nickel-plated.

Send for Bulletin giving dimensions and more complete description.



TYPE K MODULATION VALVES

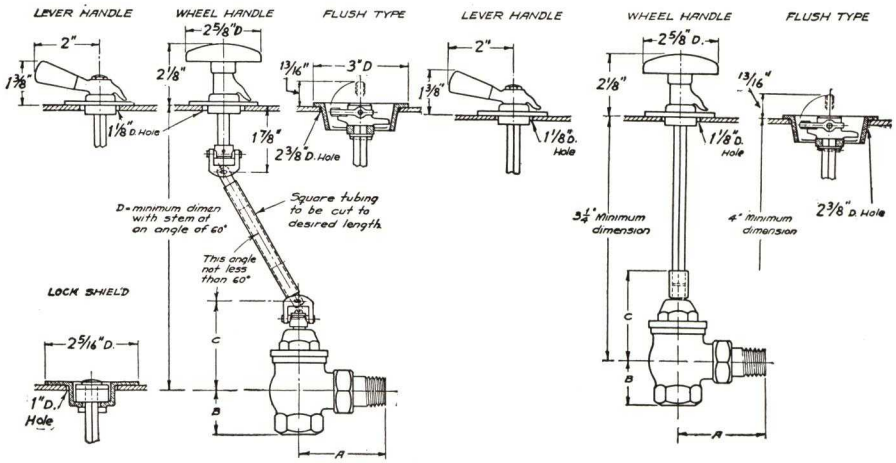
SIZE	Capacity Sq. Ft. C.I. Rad.	A	B	C	D
1/2"	30	2 3/4	1 1/4	4 1/4	2
3/4"	60	2 3/4	1 3/8	4 1/4	2
1"	100	3	1 1/2	4 3/8	2
1 1/4"	180	3 1/2	1 5/8	4 1/2	2



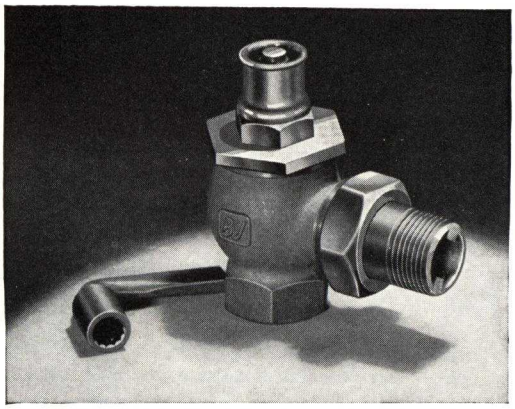
TYPE F PACKLESS QUICK-OPENING VALVES

SIZE	Capacity Sq. Ft. C.I. Rad.	A	B	C	D
1/2"	30	2 3/4	1 1/4	4 5/16	2 1/4
3/4"	60	2 3/4	1 3/8	4 5/16	2 1/4
1"	100	3	1 1/2	4 7/16	2 1/4
1 1/4"	180	3 1/2	1 5/8	4 5/8	2 1/4
1 1/2"	270	3 7/8	2 3/32	6 5/16	3
2"	400	4 5/16	2 15/64	6 7/8	3

Above capacities are based on 2 ounces pressure difference for vapor or vacuum heating systems.



Type F Packless Quick-Opening Valve



B&J Modulation Valve, Lock Shield Model

BARNES & JONES
THERMOSTATIC TRAPS

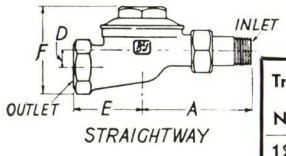
The successful operation of a vapor or vacuum system depends more on the efficiency of the thermostatic traps than any other single factor. They must allow all air and water of condensation to drain away freely at all times, but must close quickly and tightly to prevent the passage of steam into the return side of the system. The new Barnes & Jones return trap, using a thermostatic element contained in a cage, represents the greatest advancement in trap design and construction that has been made in many years.

The cage-unit contains all of the essential parts necessary for the operation of a thermostatic trap. It is a complete operating unit in itself, containing a thermostatic element with valve piece, and carrying its own seat of stainless steel or monel metal.

These cage-units can be used in any Barnes & Jones return trap now installed, and can be supplied to fit almost all other makes of traps.

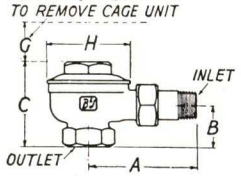
Replacement of Cage

The cage-unit can be replaced easily and quickly by unskilled labor; it is only necessary to lift the old unit out and insert a new one as shown in the illustrations at the right. No special tools are required, no adjustments, no guessing at the correct setting, no seat troubles, no piping to be disconnected—the trap is immediately returned to its original accuracy, sensitiveness and efficiency.



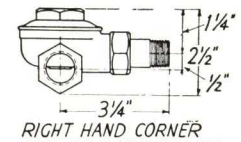
STRAIGHTWAY

CLEARANCE NECESSARY TO REMOVE CAGE UNIT

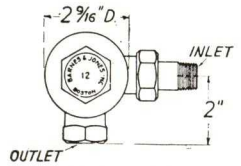


ANGLE

Trap	TAPPING		DIMENSIONS						
No.	Inlet	Outlet	A	B	C	D	E	F	G
120	½"	½"	3¼	1¼	2½	½	2	2½	1½
12	½"	¾"	3¼	1¼	2½	½	2	2½	1½
132	¾"	¾"	3⅜	1⅜	2⅞	⅝	2⅛	2⅞	1¾
123	½"	½"	3⅜	1⅜	2⅞	⅝	2⅛	2⅞	1¾
124	½"	¾"	3⅜	1⅜	2⅞	⅝	2⅛	2⅞	1¾
134	¾"	¾"	3⅜	1⅜	2⅞	⅝	2⅛	2⅞	1¾
13	¾"	¾"	3⅜	1⅜	3	⅝	2⅜	3	2
14	1"	1"	3⅝	1 11/16	3½	¾	2⅜	3½	2



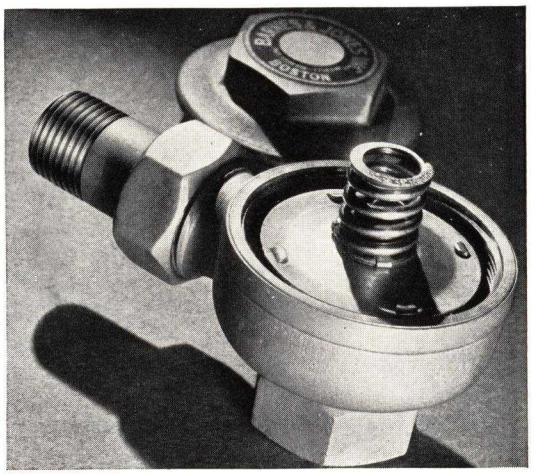
RIGHT HAND CORNER
LEFT HAND CORNER TRAP HAS THE OUTLET ON OPPOSITE SIDE

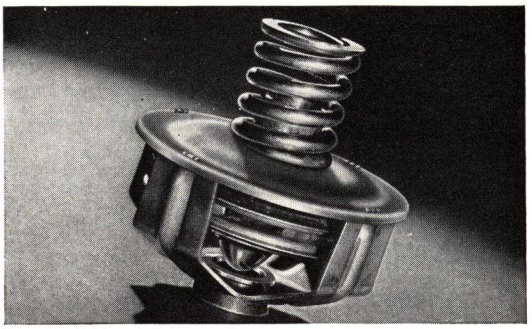


CORNER TRAP MADE IN NO. 120 AND NO. 12 ONLY

Trap	CAPACITIES IN SQUARE FEET E. D. R. PRESSURE DIFFERENTIAL IN POUNDS PER SQ. IN.								
No.	1/16	⅛	¼	½	1	1½	2	3	4
120	56	70	92	120	168	200	228	278	306
12	56	70	92	120	168	200	228	278	306
132	56	70	92	120	168	200	228	278	306
123	92	120	152	208	320	400	450	512	560
124	92	120	152	208	320	400	450	512	560
134	92	120	152	208	320	400	450	512	560
13	176	200	300	430	590	700	760	824	880
14	320	390	520	700	1000	1200	1320	1480	1600

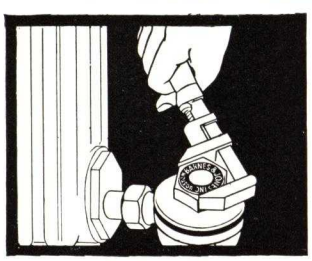
Barnes & Jones Thermostatic Trap


Thermostatic Trap with Cover Removed

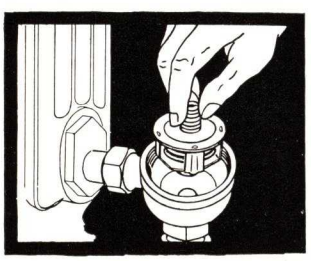

Patented Thermostatic Cage Unit

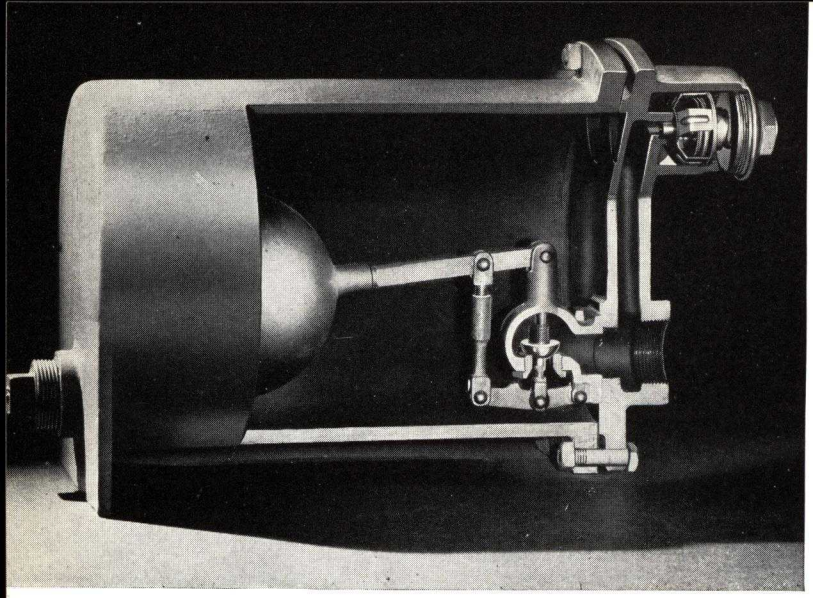
All Traps Tested Before Leaving Factory

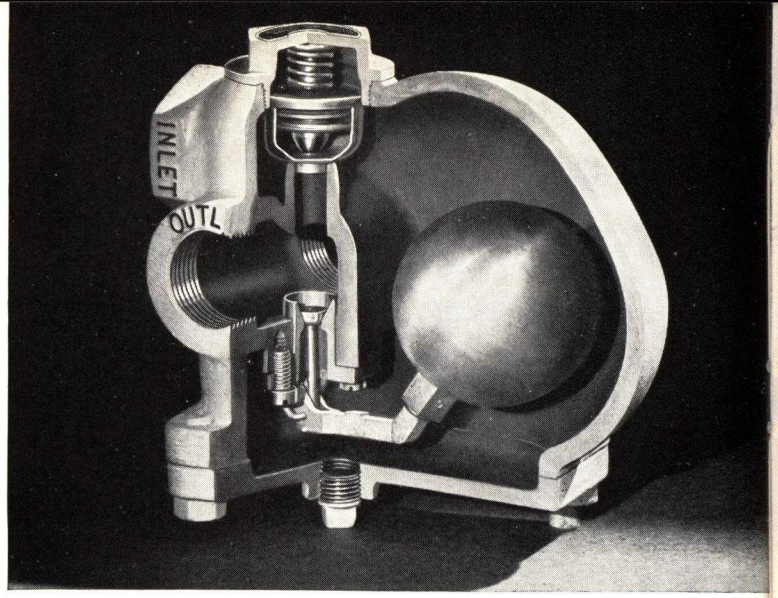
Each cage-unit is calibrated and tested at the factory for tightness and opening temperature on our steam testing rack under actual working conditions, then permanently locked in correct adjustment.


Thermostatic element is easily and quickly replaced. No special tools are necessary. Simply remove the cap—

lift out the old element and


replace it with the new cage unit. The trap is returned to its original accuracy and sensitiveness regardless of distance between the cover and seat of trap body.





Sectional Views of the Barnes & Jones Float and Thermostatic Blast Traps
Note clean design and sturdy construction. Cage containing thermostatic element is easily and quickly replaced, if necessary, as described on page 5

BARNES & JONES

FLOAT AND THERMOSTATIC BLAST TRAPS

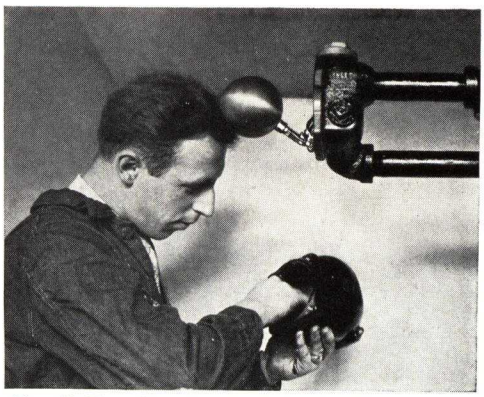
For Heavy Duty Service in Handling Condensation

These heavy-duty traps are for use at any point where large and sudden condensation loads occur—loads that are greater than can be handled properly by thermostatic traps. They perform all of the functions of ordinary thermostatic traps, and in addition have an air and water capacity large enough to take care of the condensation from all units condensing large quantities of steam at low pressure. A thermostatically controlled air by-pass located in the top section of the trap insures free and rapid elimination of air and prevents the passage of steam. The discharge of the condensate is controlled by a float-operated valve.

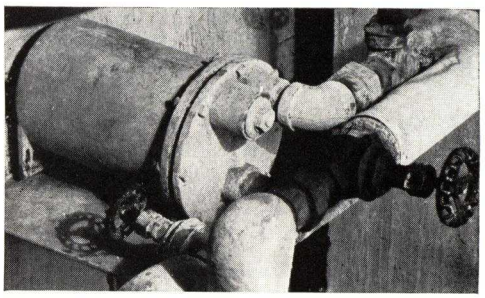
These traps are designed for use on vapor or vacuum systems and should not be used when pressure exists on the discharge side of the trap. They are designed particularly for low-pressure service and are not suitable for pressures above 15-pounds gauge pressure.

In all Barnes & Jones float and thermostatic traps the float-controlled valve governing the discharge of the condensate is always water sealed. The float is unusually large for this type of trap, providing greater leverage (or power) and insuring instant opening of the discharge valve. The air-discharge port is located in the top section of the trap, permitting free and rapid elimination of the air. It is controlled by the patented cage-type thermostatic unit shown in the sectional views below and illustrated and described on page 5 of this bulletin.

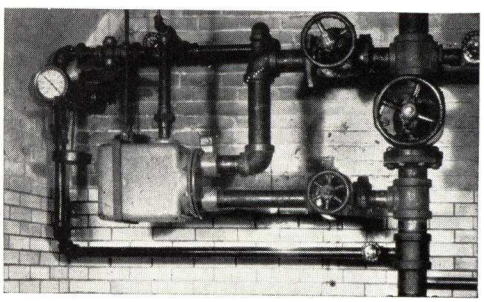
These traps are made in five sizes, varying from small, compact units to large, heavy-duty traps of large capacity. See table on opposite page.



No. 43 Trap Dripping the End of a Steam Main
Note ease with which trap may be cleaned



No. 45A Trap Handling the Condensation from a 2500-Gallon Hot Water Heater
This trap has been in satisfactory service since 1928, and has never been taken apart except for cleaning



No. 48A Trap Handling the Returns from 30,740 Sq. Ft. of Radiation on a Barnes & Jones Proportionator System

TRAPS EASILY CLEANED OR RENEWED WHEN NECESSARY

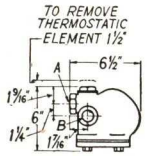
It is frequently necessary to install these traps (particularly the smaller sizes) close to ceilings or walls. Barnes & Jones engineers have kept this factor in mind, and the traps have been designed to make them easy to install and get at for cleaning in such locations. They can be taken apart for cleaning or renewal of worn parts without breaking any pipe connections and without the use of any socket or special wrenches.

IMPORTANCE OF PROPER INSTALLATION

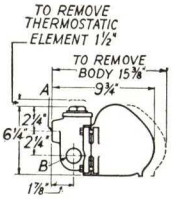
In the installation of any trap of this nature, it is desirable to use a strainer and frequently a gate shut off valve ahead of the trap. Sketch "A" shows a typical connection for dripping the end of a steam main to a vapor or vacuum overhead return main. Note the importance of using an eccentric reducer where the reduction in size is made, as otherwise a pocket will result that will prevent the complete elimination of water from the steam main.

Where a rise in the steam main is to be made, it is well to extend the main full size a short distance beyond the last connection taken off as shown in Sketch "B." Frequently the gate valve, shown in the sketches, ahead of the trap is omitted; as in many cases, if it is necessary to service the trap, the steam pressure can be dropped without causing inconvenience for the brief interval required for servicing.

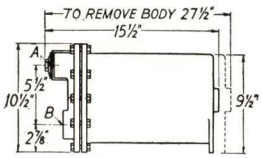
When the steam main is to be dripped to a non-pressure wet return, it is necessary to vent the discharge side of the trap to the overhead dry return or air line. This may be accomplished by using the other outlet of the trap or, if more convenient, by installing a tee in place of the elbow shown in Sketch "C" dropping to the wet return, and connecting the air line to this point. In any drip connection, if a strainer is not used, a dirt pocket should be installed.



NO. 41, 42



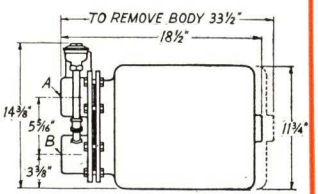
NO. 43



NO. 45A

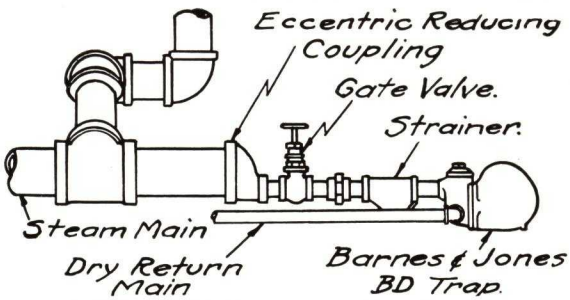
No.	Capacity Lbs. Water Per Hour	Net Weight	Tappings A Inlet	Tappings B Outlet	Width Maximum
41	200	9	¾"	¾"	4"
42	700	9	1"	1"	4"
43	1200	15	1¼"	1¼"	4½"
45A	2400	65	1½"	1½"	10½"
48A	5000	107	2"	2"	10¾"

Above capacities based on 2-pound pressure differential.



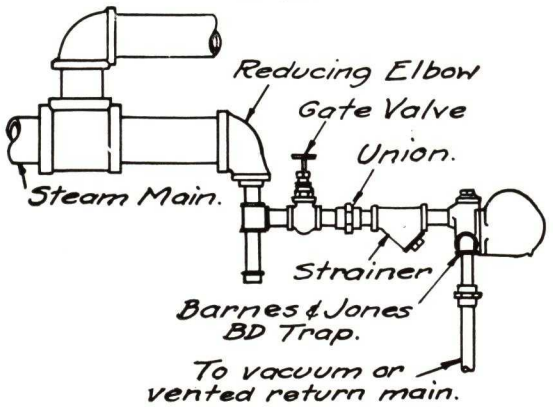
NO. 48A

SKETCH A



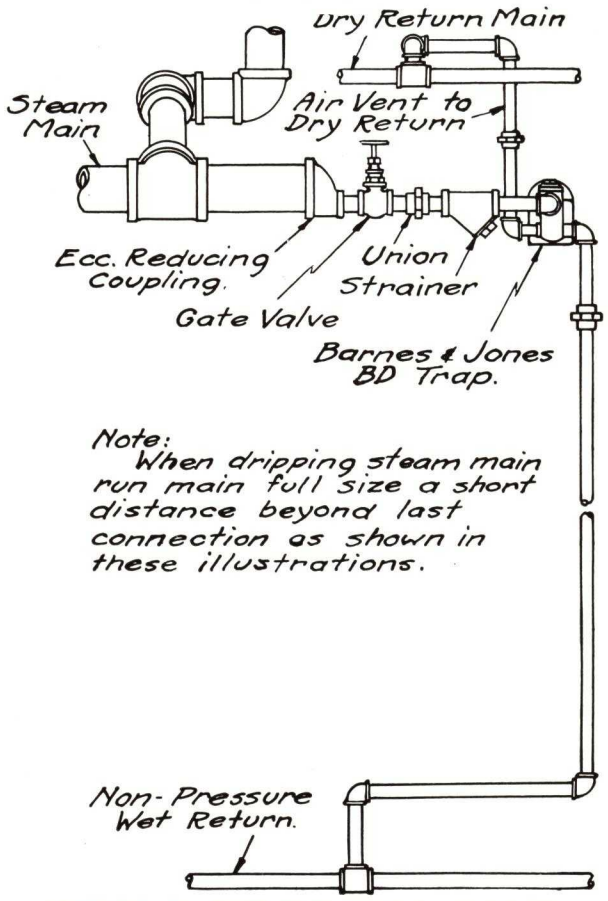
METHOD OF DRIPPING STEAM MAIN TO OVERHEAD VACUUM OR VENTED RETURN MAIN

SKETCH B

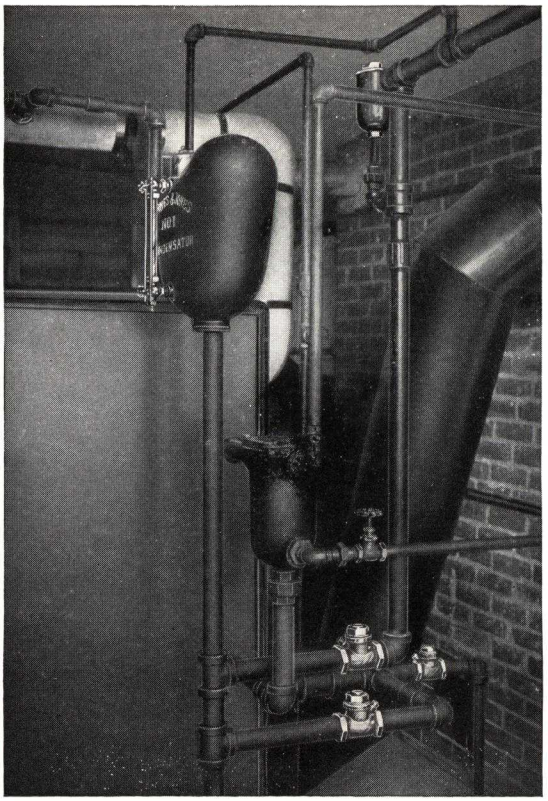


METHOD OF DRIPPING RISE IN STEAM MAIN

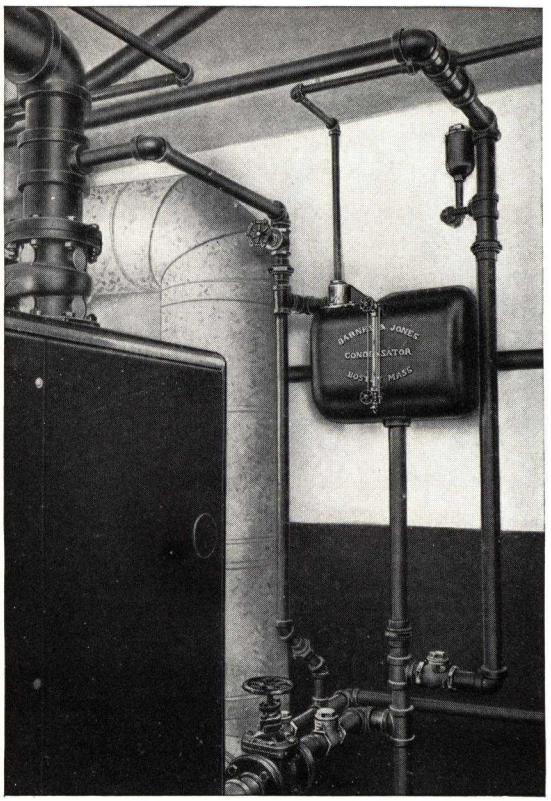
SKETCH C



METHOD OF DRIPPING STEAM MAIN TO NON-PRESSURE WET RETURN



A Typical Installation of a Barnes & Jones Condensator
Showing the vent trap in its proper position



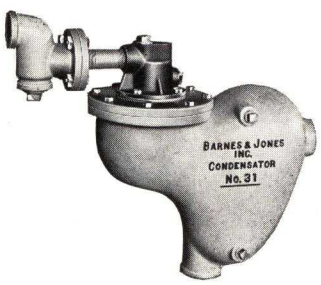
An Installation of a Larger Condensator
Note again how the condensator is vented into the dry return main, thence to the atmosphere through the vent trap

BARNES & JONES CONDENSATORS

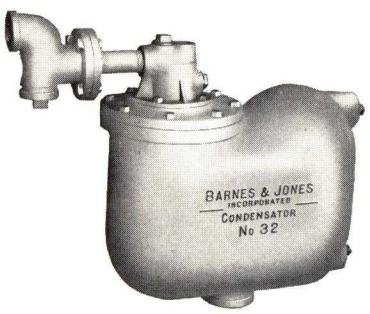
For Vapor Systems Assure Positive Return of Condensation to Boiler

The Barnes & Jones Condensator, or boiler return trap, is a safety device necessary on vapor systems to prevent damage to the boiler occurring if the steam pressure is raised above a few ounces. Its fundamental purpose is to return the water of condensation to the boiler independently of the boiler pressure. It should be clearly understood that this is accomplished without any change in the operating conditions of the system and without air-binding or admitting steam to the return side of the system. The Condensator is installed near the boiler as high above the water line as possible. The water of condensation flows into the condensator and rising, causes the steam valve to open, thus equalizing the pressure in the boiler and the condensator, and allowing the water that has collected in the condensator to return to the boiler by gravity.

The Condensator is simple in construction and its operation is positive at all times. Its few movable parts are wholly enclosed to prevent any tampering. The connections are large to eliminate friction and insure an easy and sensitive apparatus under all conditions. All working parts are of the best bronze metal.



Condensator No. 31



Condensator No. 32

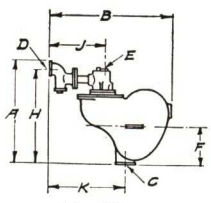
Condensator No. 33-37, Inclusive

Vent Trap

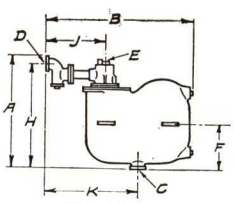
The two illustrations on the opposite page and the diagrams below show most clearly the proper methods of installing Barnes & Jones condensators. It will be noted in the illustrations that the condensator is so installed that the water of condensation comes back through a dry return main which, when near the boiler, drops and becomes wet. At the point where it drops, a Barnes & Jones vent trap is installed to allow the discharge of air from the radiators and the condensator.

After the return main becomes wet, the water of condensation passes through a check valve before it reaches the connection to the Condensator, and thence through another check valve installed in the return main between the connection to the Condensator and the boiler.

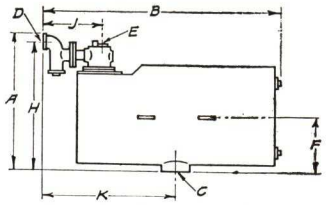
It will be noted in the illustrations that the drips from the supply mains and risers are brought back through a separate wet drip line. Where this is done, care must be taken to see that this wet drip line is connected to the boiler independently or is connected into the return main between the boiler and the inside check valve. A check valve must be installed in the wet drip line also. Steam main may be dripped through traps and separate wet drip main omitted if desired.



No. 31



No. 32



Nos. 33, 34, 35, 36, 37

C—Size of connection to Return Main.

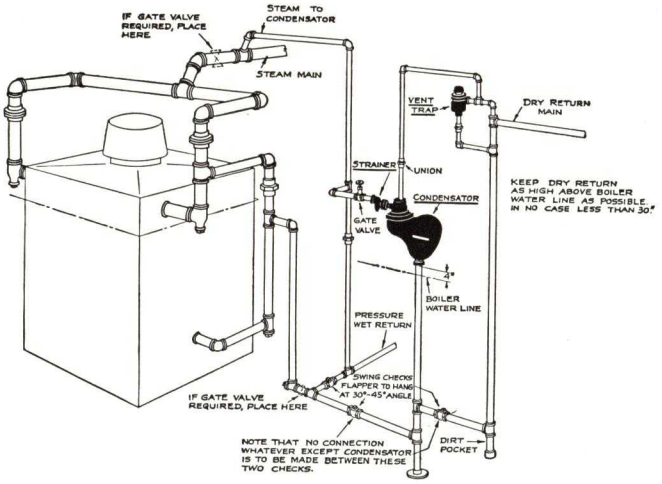
D—Size of steam connection.

E—Size of vent connection

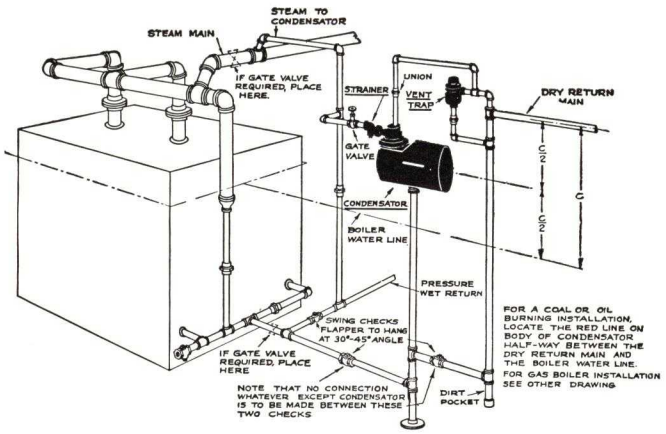
G—Maximum width

Note: Water gauge glass and cock extra.

No.	A	B	C	D	E	F	G	H	J	K	Cap. sq. ft. of C.I. Radiation	Net Wt.	Ship. Wt.
31	18⅜	22¼	1½	1¼	¾	7⅛	8½	17¼	10⅜	14¼	700	60	80
32	18⅜	23	1½	1¼	¾	7⅛	8½	17¼	10⅜	14¼	1600	75	110
33	19	24	2	1¼	¾	8	14	17⅞	10⅜	13¾	3500	100	140
34	21	26	2	1¼	¾	8⅞	15½	19⅞	10⅞	15⅜	6000	110	150
35	25	30	4	1½	¾	10½	18	23¾	11½	17	10000	170	220
36	25	40	4	1½	¾	10½	18	23¾	11½	23	16000	200	275
37	30	51	4	2	¾	13½	24	28	19	32	32000	275	375



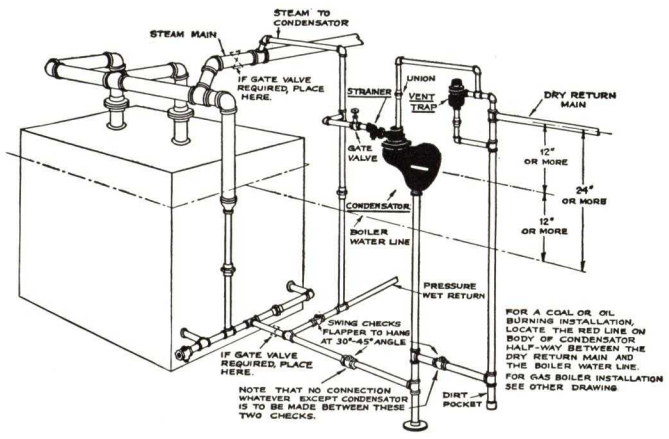
Method of Connecting No. 31 Condensator to Gas Fired Boiler



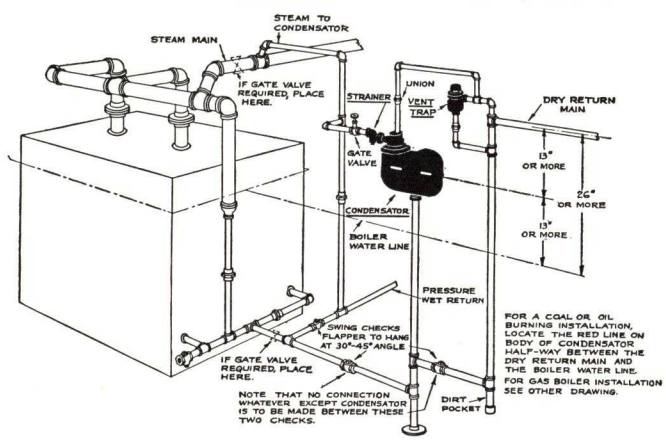
MINIMUM DIMENSION "C" FOR VARIOUS SIZE CONDENSATORS

SIZE	33	34	35	36	37
DIMENSION "C"	30"	32"	36"	42"	48"

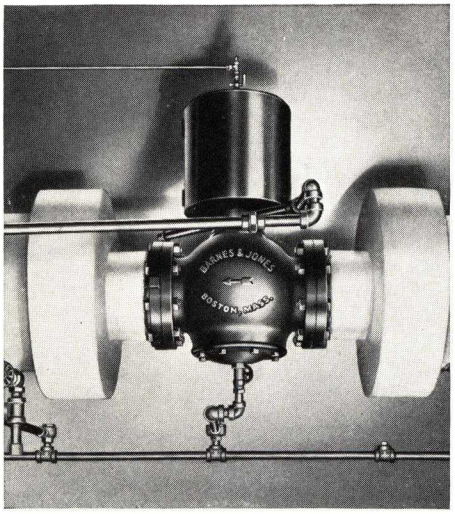
Method of Connecting Condensators Nos. 33-37, Inclusive



Method of Connecting No. 31 Condensator



Method of Connecting No. 32 Condensator



Proportionator Valve Controlling the Steam Admitted to a Zone in an Office Building

BARNES & JONES PROPORTIONATOR SYSTEM

An Efficient Method of Controlling Heat Distribution in New or Old Heating Systems

The Barnes & Jones Proportionator System provides zone heating that is extremely simple in principle, requires no complicated electrical devices and can be installed without extensive changes of piping in buildings already equipped with vapor or vacuum heating. It is particularly adapted for large buildings that buy or generate their own steam and makes possible real savings in fuel costs.

Despite the rapid increase in use of equipment and appliances for more efficient generation of heat, very little attention has been paid to control of heat where its waste is most flagrant, and almost no attention has been given to control of the rate of flow of heat to points where it is used. A large portion of the average building is usually much more overheated than underheated. In heating a portion that does not benefit by the sun's rays or is in the face of a cold wind, other parts of building become overheated. This causes much waste. To remedy this situation, a new system of control was needed which would supply heat **when** it is needed, **where** it is needed, and **in proportion** to that need.

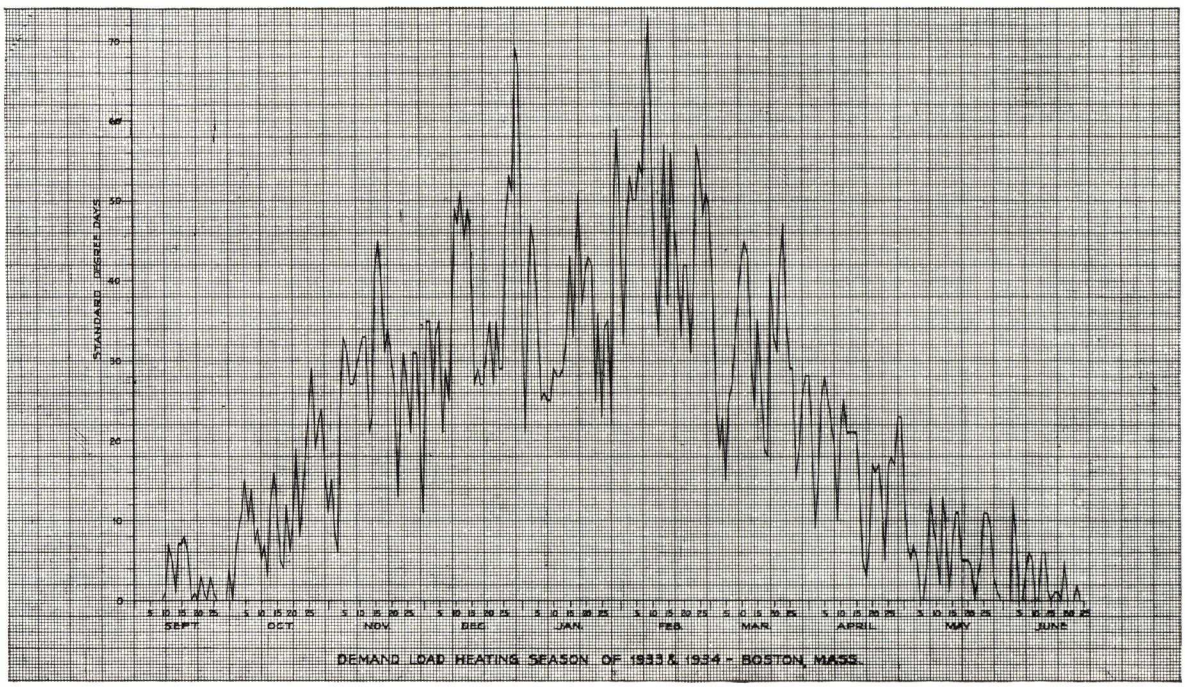
HEAT DELIVERED ONLY WHEN AND WHERE AND IN PROPORTIONS NEEDED

The Barnes & Jones Proportionator System provides this control. It allows flexible operation so that only enough steam is supplied the radiators to furnish heat to building to balance heat loss for any outside temperature condition. Thus, if only a small amount of heat is necessary, a slight turn of a pointer on the control panel will uniformly distribute a very small quantity of steam throughout the system.

The Barnes & Jones Proportionator System controls the rate of flow of steam so that each section of building gets heat in proportion to its need, regardless of amount of heat required elsewhere. This keeps all parts of the building at a comfortable temperature, eliminates complaints, conserves fuel, and saves money. These results are accomplished without complicated control apparatus or piping.

CHART SHOWING VARIATION IN DEMAND LOAD DURING A TYPICAL HEATING SEASON

The chart shows how demand load varies during the heating season. Note the wide variations. Exposures of various sides of building to prevailing winds, the sun, occupancy, etc., are important factors affecting heat losses. A new system can be designed to give maximum flexibility in control. An old system, while the piping may not be ideally arranged, can be vastly improved and material economies effected.



CONTROLS FOR THE SYSTEM

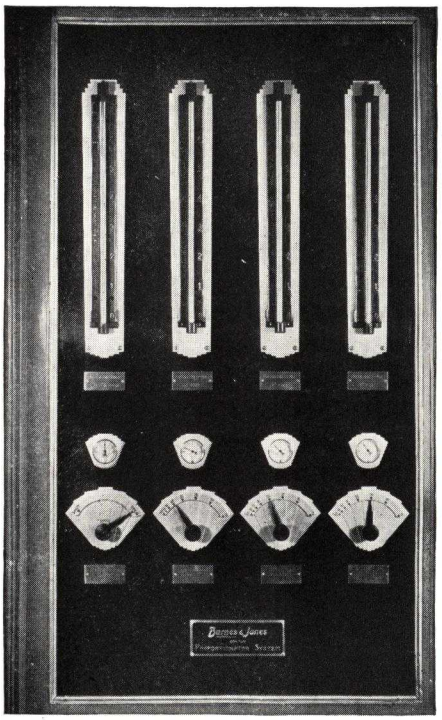
ZONING THE BUILDING

In applying the Proportionator System, the first step is to study the layout of the building and divide it into sections or zones, according to the heat requirements. The number, size, and location of the zones will be governed by the height of the building, exposure, prevailing winds, types of occupant, use during occupancy. Many buildings and most homes need only to be divided into two zones, but where conditions require it, six, eight, and sometimes ten zones are not unusual.

The sole purpose of the apparatus is to provide the necessary amount of steam to any part of the building to balance the heat loss from that part of the building. It thus prevents overheating and provides more comfortable conditions for the occupants. The elimination of overheating naturally results in a material saving of steam which rapidly absorbs the cost of the equipment.

CONTROL BOARD

In a typical installation a control board is located at some convenient point, preferably in the superintendent's or chief engineer's office. If desired, a remote reading thermometer installed on the control panel makes it possible to ascertain the temperature in any zone at any time.

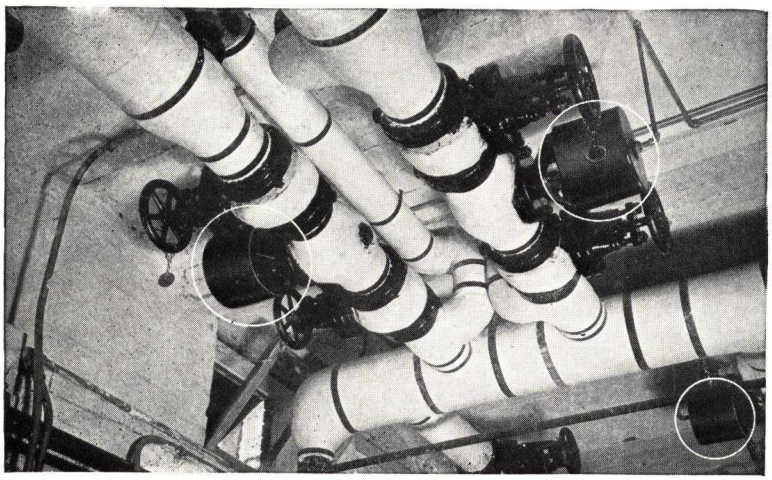


A Typical Control Board for Barnes & Jones Proportionator System

THE PROPORTIONATOR VALVES

A proportionator valve is installed in each supply line which feeds the zone, and when used in conjunction with the control, supplies steam to the zone when it is needed and in proportion to that need.

The photograph at the right shows a view of the boiler room piping of a building equipped with a Barnes & Jones Proportionator System. Note the proportionator valves in the steam mains supplying the different zones of the building.



MODULATION OR PACKLESS QUICK OPENING VALVES AND RADIATOR TRAPS

Each radiator should have a Barnes & Jones Type "K" or Type "F" valve on the supply and a Barnes & Jones thermostatic trap on the return. A Barnes & Jones orifice carefully proportioned for proper results is installed in the union connection of each supply valve. The function of the orifice is to equalize distribution of the steam, and to make possible a variation in the amount of each radiator heated, by a change in steam pressure. This feature in itself is of great value in the operation of any heating system.

A PROPORTIONATOR SYSTEM FOR NEW OR OLD BUILDINGS

The problem of arranging the piping for a new installation is simple and the proper layout can usually be accomplished with little or no additional cost over an ordinary system. We wish to emphasize the fact, however, that the Barnes & Jones Proportionator System is just as applicable to a building already built as for a new building. Due to obsolescence of equipment, and lack of any means of control it is of great importance to modernize existing systems. Modernizing present plants can usually be accomplished at small expense, and results in not only a fuel saving, but also in greater comfort for the tenants. One of our recent modernizing installations in an office building of over a thousand radiators resulted in a fuel saving which paid over half the cost of the entire modernization work the first year.

BARNES & JONES, INC.

FACTORY AND MAIN OFFICE
128 BROOKSIDE AVENUE (Jamaica Plain)
BOSTON, MASSACHUSETTS

Branch Offices or Representatives in All Principal Cities

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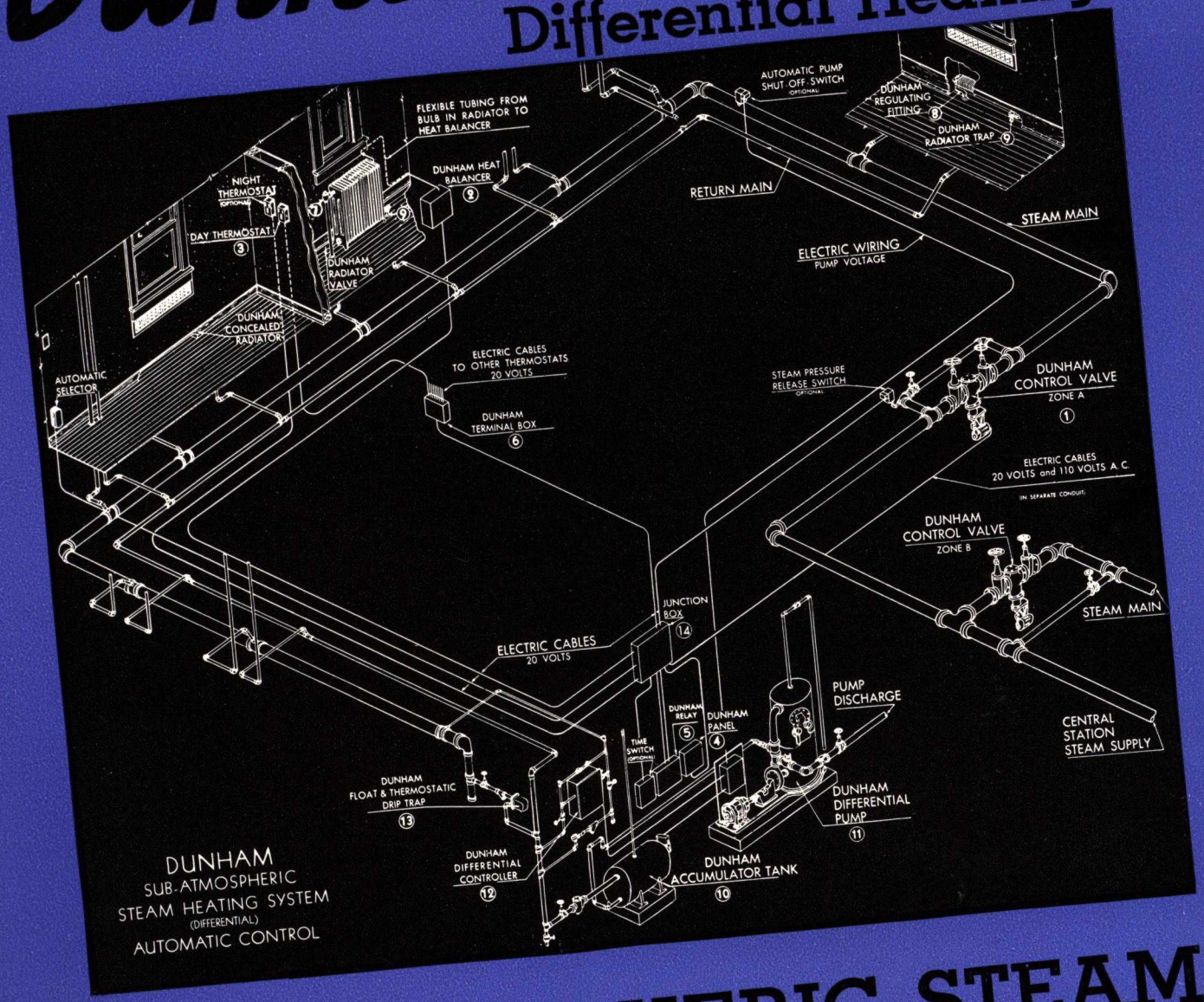
Dunham Differential Heating



SUB-ATMOSPHERIC STEAM HEATING SYSTEM

C. A. DUNHAM COMPANY
450 EAST OHIO STREET, CHICAGO, ILLINOIS

THE DUNHAM
SUB-ATMOSPHERIC STEAM HEATING SYSTEM

What It Is

The Dunham Sub-atmospheric Method of Heating is a two-pipe steam system which continuously distributes steam at a variable rate equal to the loss from the building. It unifies the function of **heat distribution** and **heat control** in the normal operation of a simple heating system by circulating steam at **variable sub-atmospheric pressures** and corresponding **low temperatures** and by controlled partial filling of the radiators with steam at the low-temperature limit of system operation.

The Differential principle, recognized now (with a satisfactory 11 year record), for its superior performance, was in 1927 a revolutionary departure from the standard vacuum return line system then regarded as the most satisfactory and economical type of steam heating system for larger and moderate-size buildings, or groups of buildings, heated from a central plant.

What It Provides

ADAPTABILITY—Sub-atmospheric Steam Heating offers to **Architects** and **Consulting Engineers** a method of controlled heating-system design adaptable to their individual plans. Piping design and sizing and radiator connections are as simple as for an uncontrolled system. They are as flexible as construction requirements are varied. No restrictions are placed upon the types or **combination of types** of radiation employed. Provision for zoning increases the precision with which steam distribution can be adapted to a wide diversity of building types, sizes and services.

TEMPERATURE CONTROL—The Dunham Sub-atmospheric Steam Heating System gives controlled heating comfort without adding control devices as "Extras." The control may be either manual or fully automatic, as hereinafter described. In either case a continuous (not "off" and "on") heat supply is provided which may be reduced to a rate which is in relation to weather conditions without interruption of circulation. In one stage of its control it utilizes steam temperature variation which covers a wide range of conditions. In the second stage it **limits steam volume** (at sub-atmospheric conditions) controlling **partial filling** of radiators thus continuing the reduction of heat output.

AUTOMATIC CONTROL— In this method the control is fully automatic and is incorporated as a normal function of the system operation itself.

1. It provides the radiators with steam at a temperature and in the amount required to meet heating demands of the existing weather conditions. Beginning with a maximum heat output obtained by steam circulation at a pressure of 2 pounds and a temperature of 218°F, **or more, as required,** the output is progressively reduced according to the demands of the weather by a reduction in the rate of steam admission to the system, which automatically causes a reduction in steam pressure and temperature until steam is being circulated at a temperature of about 133°F.
2. Further reduction in heat-output is obtained by partial filling of radiators with sub-atmospheric steam until the point is reached at which the need for heat ceases and the supply of heat is completely shut off.
3. A positive circulation is maintained as a fundamental function of the system. This tends to maintain unusually constant temperature levels throughout the building.

MANUAL CONTROL—This method is adaptable to many types of buildings and is particularly attractive for projects in which first cost for the heating installation must be held to a minimum and in which precise temperature regulation governed by thermostat may not be warranted by nature of occupancy, service or layout.

The designing and installation of the system is as simple as for a return line vacuum heating system. The installation requirements are substantially the same.

The Low Duty System and the High Duty System are the same except that in the latter, the traps will function up to 25″ of vacuum (as against 15″ for the standard traps used in Low Duty service). In Low Duty service, standard packless radiator valves can be used, but for High Duty Systems, the Dunham "Oriflex" self-adjusting type is required.

TEMPERATURE CONTROL OF THE SUPPLY PIPING—Sub-atmospheric Heating governs the heat output of all supply piping as well as that of the radiation itself. This means control of the usually uncontrolled heat output of supply piping which frequently would be sufficient, if equitably distributed, to heat the whole building, and which becomes an increasingly greater proportion of the total output of the system as the weather moderates. This steam supply piping output is never equitably distributed in ordinary practice, and as the steam supply cannot be shut off, building areas near the supply are overheated. By a progressive reduction in steam temperature the Sub-atmospheric System reduces supply piping heat output approximately 60% as the weather moderates.

FUEL OR STEAM ECONOMIES—The vitality, efficiency and health values of controlled heating, while readily demonstrable in tests, are normally regarded as intangibles difficult to evaluate.

The Fuel Saving which results from temperature control is, in contrast, a tangible advantage which can be measured in terms of dollars required to buy steam, oil, gas or coal.

The most conclusive and unassailable evidence, however, is the "before" and "after" data and ten-

ant reaction from buildings heated by ordinary systems and "changed over" to Sub-atmospheric Heating. In percentages these annual savings run from 25% to 50% and in dollars they represent a rather large fraction of the cost of converting the installation.

Economies may be summarized:

1. Control of building temperature extending over the entire heating season with accuracy under mild weather conditions.
2. Control of heat loss from supply piping.
3. System control is not upset by abnormal demands such as opening windows.
4. Normally no injurious corrosion is encountered in low pressure steam heating systems. Where there is such corrosion, Sub-atmospheric Steam Heating has a distinct value. In Sub-atmospheric steam the rate of penetration by corrosion in the piping system is reduced approximately 50% from that obtaining in systems operated at atmospheric pressure. Data on tests conducted at the Michigan College of Mining and Technology will be found in the Proceedings of the A. S. H. V. E.

SATISFACTORY WINTER AIR CONDITIONS — Air Conditioning is defined as the maintenance of definite relations of temperature, humidity, air motion and freedom from dust and odors.

The Sub-atmospheric System provides a relatively large measure of the functions contemplated in air conditioning for the eight months of the year in which heat may be necessary.

1. It continually maintains a comfortable temperature level.
2. Continuous steam supply at variable temperatures prevents chilly drafts.
3. It avoids the objectionable "burnt odor" which characterizes space served by high temperature radiation.
4. The lower velocities of convection reduce the dust content of the air.
5. It does not overheat or overexpand the air, consequently natural humidity is conserved.

Where It Applies

The fact that Dunham Sub-atmospheric Steam Heating is giving satisfying heat comfort today in buildings whose requirements range from the whole group of skyscrapers of Rockefeller Center in New York and of commercial buildings in practically every state of the Union to those of fine large private residences, affords sufficient proof of its complete adaptability to heating requirements.

DUNHAM COOPERATION

For more than thirty years the Company, through a national organization of research and specialized engineering, has been engaged solely in the problem of making steam an easily managed and economical heating servant in every size and type of building. The accumulated experience of the Dunham organization is put at the disposal of the Heating and Ventilating Engineer. This cooperation is available for Modernization Work, as well as for new construction in industrial, commercial and other projects.

Over eighty sales engineers who sell and service Dunham Products in the United States, Canada and the United Kingdom bring Dunham Heating Service as close to you as your telephone. Consult your classified telephone directory for address in your city. These sales engineers are capable of selecting the correct Dunham System and Appliances for any type of building.

C. A. DUNHAM COMPANY
Administrative and General Offices
450 E. Ohio Street, Chicago, Ill.
Factories: Marshalltown, Iowa; Michigan City, Ind.

SALES ENGINEERS

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	Huntington, W. Va.	Missoula, Mont.	Rochester, N. Y.	Wichita, Kansas

Look for "Dunham Heating Service" in the Classified Telephone Directory

C. A. DUNHAM COMPANY, LTD.
General Offices and Factory
1523 Davenport Road,
Toronto, Ontario, Canada

C. A. DUNHAM COMPANY, LTD.
(of the United Kingdom)
General Offices and Factory
Morden Road, London, S.W. 19, England

THE SYSTEM

DIFFERENTIAL PRINCIPLES

STEAM TEMPERATURE VARIATION—That the temperature of steam varies with its pressure is an old established fact.

Then why not **Control the Pressure or Vacuum** of the steam in the supply piping and radiators and in so doing **Control the Temperature** of the steam in the radiators and thereby the building?

An illustration—If steam at 2 pounds pressure (218° F.) provides sufficient heat to maintain a building temperature of 70° F. with an outside temperature of 0° F., a reduction in steam pressure to 25 inches vacuum giving a steam temperature of 133° F. would be sufficient for much warmer weather, since the radiation surface is fixed.

Reduction in steam temperature as employed in the Differential System thus in itself affords complete control of building temperature over a large range of the outside temperatures usually encountered.

Further control is obtained through control of steam volume.

STEAM VOLUME VARIATION—The heat output of the radiation is further reduced by the partial filling of radiators with sub-atmospheric steam, the amount of partial filling being reducible to the point at which the need for heat ceases entirely.

These two fundamentals form the basis upon which the system was developed. See illustration, Fig. 1813, below.

PRINCIPLES APPLIED—If steam was to be circulated at pressure, varying from 2 pounds gauge to 25 inches of vacuum and at variable volumes under high vacuum condition, appliances had to be developed and correlated to perform the necessary functions of distribution and control.

Control valves were developed to govern the rate of steam admission to the heating system. Valves which can be automatically governed by the heat demand of the building, and manually regulated valves are available.

Equal filling of radiators under continuous steam circulation was obtained by the development of regulating devices designed to interpose measured resistance and to proportion steam flow to each radiator.

Radiator and Drip traps, preventing steam passage while permitting condensate and air to flow to the return piping, were designed.

To provide the range of vacua under which this system functions, a vacuum pump was designed which is amply capable of producing and maintaining the necessary wide range of vacua.

The "Pull" on the return end of the system must at all times be slightly greater than the "Push" established by the rate of steam admission through the control valve. This requirement is met with a Differential Controller. Both supply and return pressures act upon the Differential Controller which starts and stops the vacuum pump to maintain the return pressure continuously lower within fixed limits than the supply pressure under all rates of steam admission to, and condensation within, the system.

In the Sub-Automatic System under automatic control, a basic rate of heat supply is established closely in accord with the requirements of the building. This basic rate is further modified. The room thermostats maintain the room temperatures at the desired point. The basic rate of heat supply is established by the Automatic Selector through the Heat Balancer. Under manual control the rate of supply is determined by the operator.

THE TOTAL FUNCTION—The total function of the Differential System is to deliver steam uninterruptedly to the radiation at pressures and temperatures and in volumes which vary in response to weather demands.

It is attained simply and effectively by the cooperative action of all parts of the equipment.

To appreciate the full value of Differential Heating it is necessary to understand not only the operation of each part but to realize the results of their cooperative action.

This can readily be done by tracing the complete cycle of automatic system operation which is indicated in Figure 1639C on Page 5.

THE CYCLE OF OPERATION—Fig. 1639C illustrates schematically the cycle of steam distribution and control. Steam from the boiler (9) flows through the Dunham Control Valve (5) and on to the radiators (6) into which it is admitted through a Dunham Radiator Valve equipped with a Regulator Plate* (10). The Dunham Radiator Trap (11) prevents passage of steam but allows air and condensation to flow into the return piping and back to the Differential Pump (8) from which the air is vented and the condensation returned to the boiler. The Differential Controller (7) actuates the pump to maintain the pressure (vacuum), in the return piping always slightly lower than the pressure in the steam supply piping insuring continuous circulation. The Automatic Selector (12) determines the maximum rate of heat supply and adjusts the Heat Balancer (2) accordingly. The Thermostat(s) (1) modify the rate established by the Selector insuring continuous circulation. *The resultant demand is transmitted through the Junction Box (13). The Panel (4) affords complete operator-control of the entire system.*

*Valves with regulating device built into them and which may be adjusted without breaking pipe connections are now available, (see page 11).

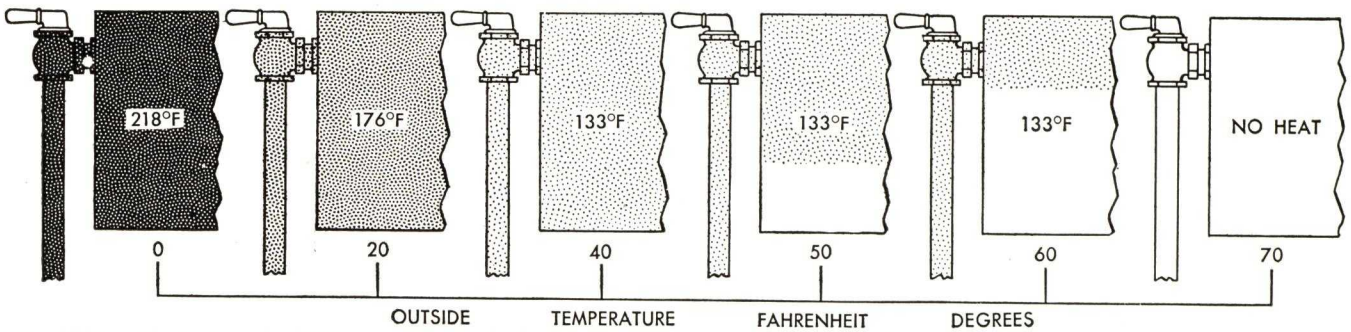


Fig. 1813—Illustrating the Differential Method of reducing heat output by reducing first the steam pressure and temperature and finally the volume.

EXPLAINED

DESIGN FUNDAMENTALS

SOURCE OF STEAM—The System requires a continuous supply of steam from any dependable source to the control valve at a pressure of 2 pounds gauge and not exceeding 10 pounds. The typical illustration on front cover indicates use of central station steam with automatic control, that on the back cover, an individual boiler plant with manual control.

PIPING—The piping must be designed and installed to free itself entirely of water by gravity flow to the Accumulator Tank of the Differential Pump. It must be properly graded, anchored and supported.

PIPE SIZING—Pipe sizes are the same as those used in standard practice for vacuum return line heating systems.

GRADING—The steam and return mains must be carefully and uniformly graded in the direction of flow with a fall of not less than ½ inch in 10 feet.

LIFT CONNECTIONS—These must not be used in the steam and return piping because of the small pressure differential which maintains steam flow in the System.

CONTROL VALVE—The Control Valve regulates the continuous admission of steam into the heating mains. It is not an "on and off" but a "graduated operation" valve controlled at various percentages of its full opening by an electric motor in response to the demands of the thermostatic appliances.

RADIATION—Concealed radiators, cast iron direct radiators, unit heaters and unit ventilators are commonly used on Sub-atmospheric installations. Continuous steam circulation eliminates difficulties due to the unequal heat storage capacity of these various types of radiation.

RADIATOR VALVES—Dunham Bellows Type Packless Radiator Valves are particularly recommended for Sub-atmospheric installations because their bellows construction makes them leak-proof. Freedom from air leakage is a factor affecting the high vacuum limit of operation of a sub-atmospheric steam installation.

FLOW REGULATING DEVICES—These devices provide control of distribution of steam within the system. They establish a reservoir condition in the steam supply piping which causes the radiators to be filled proportionate to their capacities. They are available as a complete valve including regulating feature, plates for use with ordinary types of valves, or fittings. Special fittings for use on Concealed Radiators are also available.

TRAPS—The Dunham thermostatic trap maintains radiators at maximum efficiency by draining water and venting air from them while preventing the passage of steam into the return piping. The trap does not alternately open and close but adjusts itself to a position determined by the prevailing temperature and pressure conditions.

VACUUM PUMP—The function of the pump is to remove air and condensable gases from the heating system and to return water of condensation automatically to the boiler while maintaining steam circulation. It is designed upon the "kinetic exhauster principle" which has proved its ability to perform consistently and quietly over long periods with a minimum of attention and maintenance.

DIFFERENTIAL CONTROLLER—The Differential Controller automatically controls the pump to maintain steam circulation under conditions corresponding to the rate of steam supply through the control valve. It is connected to both the supply and return piping and is actuated by the difference in pressure between them.

HEAT BALANCER AND AUTOMATIC SELECTOR—Control of a heat supply solely from room thermostats has certain weaknesses recognized as "hunting," "seeking" and "overshooting and undershooting." The Automatic Selector and the Heat Balancer overcomes these difficulties by limiting the rate of heat supply to a basic value in accordance with the building heat losses.

THERMOSTATS—The thermostat (s) evaluates room temperature and modifies the basic rate established by the Heat Balancer.

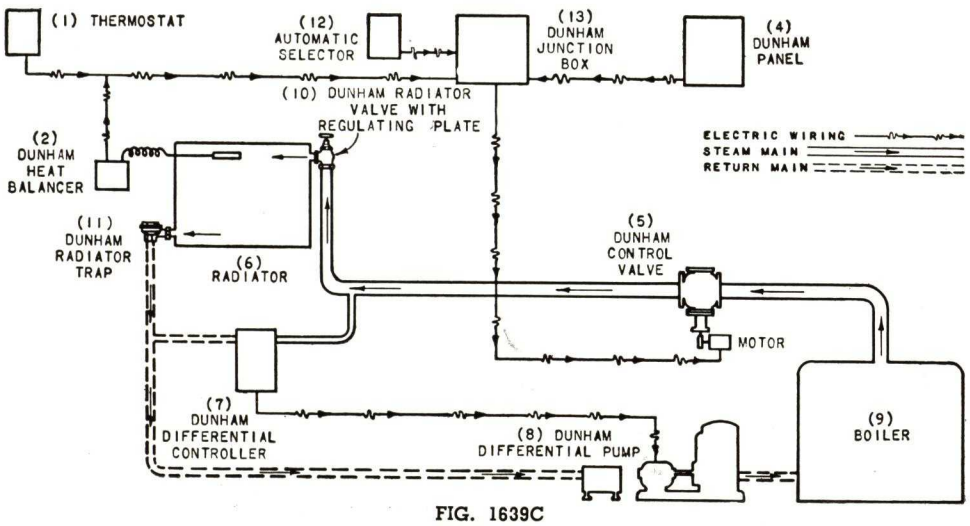


FIG. 1639C

TYPES OF

For good heating the heat supply must be both variable as to rate and responsive as to control to compensate continuously for the vagaries of the weather.

In addition to meeting this fundamental requirement the system must have adaptability of design to a wide diversity of building types, sizes and services.

The System is as flexible as construction requirements are varied. The equipment which governs steam distribution is as simple and as easy to install as that required for uncontrolled systems. The adaptability of the design is also particularly true of the control appliances.

AVERAGE TEMPERATURE CONTROL—Dunham Sub-atmospheric Steam Heating employs the elastic qualities of steam to provide a smoothly variable supply of heat. Average-Temperature Control has been perfected as an integral part of the system to link the variable supply to the fluctuating requirements for heat. **It gives accurate, automatic and continuous regulation of building temperature.**

Average Temperature Control is a descriptive name for the following functions:

(1) A continuous evaluation of the average of heat requirements at a number of thermostat locations in a building or zone of a building.

(2) The continuous averaging of this demand for heat with that established by the Heat Balancer and Automatic Selector, and the continuous transmission of the resultant demand to the Control Valve in the steam main.

(3) The automatic operation of the Control Valve to deliver steam at a rate continuously in correspondence to the average heat demand.

The Thermostats perform the function of evaluating and averaging the heat requirements. They produce a "graduated" rather than an "on-and-off" demand for heat. They are located throughout the building, or zone, in relation to its height, exposures and orientation to give an average thermostat demand in step with the actual building demand for heat. The demand from these Thermostats is transmitted electrically to the motor of the Control Valve to increase or decrease the basic rate of steam supply established by the Automatic Selector and Heat Balancer.

The System automatically adjusts itself to maintain steam circulation under pressure, temperature and volume conditions which correspond to the rate of heat supply called for by the average demand.

Sub-Atmospheric Steam Heating with Average-Temperature Control is adaptable to all types of buildings in which occupancy requires a relatively high degree of human comfort and efficiency.

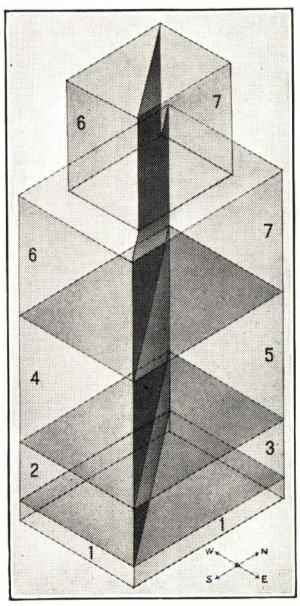


Fig. 1659

REMOTE CONTROL—The Dunham Panel is equipped with switches to change the system from automatic operation, which is normal practice, to remote control as may be desired for night service or emergencies. Under remote control, the rate of steam admission to the system is adjusted at the will of the operator from the Panel.

MANUAL CONTROL—Manual Control provides a major portion of the advantages of sub-atmospheric steam for buildings in which, by reason of financing, occupancy, service or layout, the ultimate precision of Automatic Control is not warranted. This type of installation is also economically adaptable to many existing buildings in which operating costs should be reduced and heating service improved.

Manual Control is suitable for all types of buildings. The service and occupancy of some types of structures may warrant a substantial measure of control upon the basis of comfort and operating economy, but may not make the finest precision in temperature regulation imperative. Here, also, and in buildings in which consideration of first costs outweigh the benefits of complete temperature regulation, Manual Control may be applied advantageously.

Manual Control may be used either with individual boiler plant or with central station steam. The heat output reduction effected by steam temperature variation is from 25% to 50% of the total system capacity and is obtained by utilizing a range of pressure from 2 lbs., or more, above that of the atmosphere down to as low as 25″ of mercury vacuum, with corresponding steam temperature variation. Further reduction in output is secured without interruption of steam supply, through progressively **reducing the volume** of steam in circulation and thereby producing a condition of partial filling in the radiation.

ZONE CONTROL—To insure the finest degree of precision in temperature regulation and the lowest possible heating costs, it may be advisable to divide large buildings into a number of heating zones, each having an individual system of supply piping and each being controllable in accordance with the particular heat requirements of the section it serves.

This practice is called zoning. It is used in buildings serving more than one purpose, such as an office building containing stores or a theatre; in institutional buildings housing various departments and services with varying temperatures and time requirements for heat; and in tall buildings with sectional variations of wind and sun exposure and subject to the phenomena of "stack (chimney) effect." Obviously each zoning project must be dealt with individually. This should be done in the light of the factors of service requirements, occupancy, exposures (wind and sun) and the construction, size and shape of the building.

Typical zoning practice is illustrated schematically in Fig. 1659. Zone 1 comprises the main floors including foyers, mezzanines and frequently shops, banks and other types of establishments. Above this zone, the building may be divided, as in this case, both with respect to exposures and to height.

CONTROL

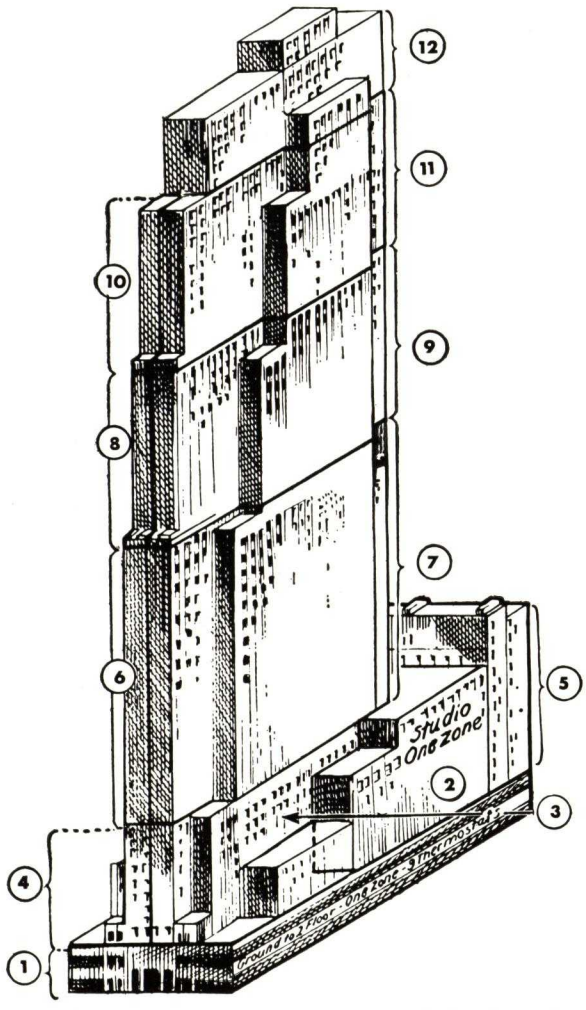
Zones 2, 4 and 6 serve the south and west sides of the building at various heights and Zones 3, 5 and 7 serve the north and east sides with the same subdivision as to height.

When a Sub-atmospheric installation is zoned, each zone is regarded as an individual system. Each zone requires a separate system of steam supply piping. Each also requires separate regulating equipment, including a Control Valve, a Heat Balancer, Automatic Selector, Thermostats and a Differential Controller. Where the radiation load of two or more zones does not exceed the capacity of a single Differential Pump, one pump may serve a plurality of zones.

Under certain conditions, one Differential Controller only may be necessary for several zones. Where one zone comprises blast radiation, a separate pump is usually required for this load.

THE ZONING OF ROCKEFELLER CENTER FOR SUB-ATMOSPHERIC STEAM HEATING

Architects: Reinhard & Hofmeister; Corbett, Harrison & MacMurray; Hood & Fouilhoux. Consulting Engineer: Clyde R. Place



1—Ground to 2 Floor, One Zone.
2—Studio, One Zone.
3—3 to 11 Floor, North Zone, 9 Thermostats.
4—3 to 11 Floor, South Zone, 9 Thermostats.
5—Building No. 9, One Zone, 9 Thermostats.
6—12 to 32 Floor, South Zone, 9 Thermostats.
7—12 to 32 Floor, North Zone, 9 Thermostats.
8—32 to 45 Floor, South Zone, 9 Thermostats.
9—32 to 45 Floor, North Zone, 9 Thermostats.
10—45 to 64 Floor, South Zone, 9 Thermostats.
11—45 to 64 Floor, North Zone, 9 Thermostats.
12—64 to 70 Floor, One Zone, 4 Thermostats.

Because of its size, height and the diversity of services housed, the 70-story Central Tower of Rockefeller Center (Radio City), New York, provides an instructive example of zoning. It also illustrates the range of adaptability of the Differential Vacuum Heating System and the flexibility of control obtainable. The heating installation was designed by Clyde R. Place, Consulting Engineer. In zoning, the major portion of the building was divided vertically to take care of exposures and horizontally to take care of stack effect. Additional zones were established to take care of special requirements.

The vertical division of zones makes it possible to supply heat at a higher rate to the zones on the north side than to those on the south. The horizontal division makes it possible to supply heat to the upper zones at a rate lower than to the lower zones.

Zone 1, comprising the ground and second floors, is mainly banking quarters and shops. Here zoning for exposure is not important because of the protection provided by neighboring buildings. Building 9, comprising Zone 5, which adjoins the Central Tower, will be given over to occupancy of special type; here also the protection of neighboring buildings makes zoning for exposure unnecessary. Zone 2 is the studio of the National Broadcasting Company.

Steam is carried to the supply point of each zone at 50 pounds pressure and there reduced by means of a reducing valve to 2 pounds for supplying the Control Valve which is a part of the Dunham Differential Vacuum Heating System.

One return main leads from the South Zones 4, 6, 8, 10 to a Dunham Differential Pump in the basement of the Tower Building.

Another return main leads from the North Zones 3, 7, 9, 11 and the top zone 12 to a second Differential Pump, which with an additional pump for stand-by service is also located in the basement of the Tower Building.

Returns from Zones 1 and 5 lead to a Differential Pump in the basement of Building 9.

Returns from Zone 2 lead to another Differential Pump, also located in the basement of Building 9.

FUEL OR STEAM ECONOMIES

FIRST COSTS—A Sub-atmospheric System is a complete heating system which incorporates temperature regulation. Its first cost is greater than that of an uncontrolled heating system such as the ordinary vacuum return line system. For this greater first cost, the owner receives over the life of the building, greater heating satisfaction in terms of comfort and health, plus an annual reduction in fuel consumption of from 20 to 30 per cent below an ordinary heating installation.

In this system the owner buys low cost heating plus temperature regulation. The purchase of an ordinary system requires the additional purchase of temperature control equipment. A cost comparison on these purchases substantially favors the Sub-atmospheric System and reveals its true value as a heating investment.

HEATING COSTS—Convincing proof of fuel savings by Sub-atmospheric Steam Heating is to be found in the operating records of the heating plants of buildings from coast to coast which have been converted from ordinary heating to a Sub-atmospheric System.

Fuel consumption rates in new buildings are as low (and usually lower by reason of better control of design and installation) as in buildings changed over to Sub-atmospheric operation. Comparison is, however, more difficult in view of the variable factors encountered between different buildings, localities and seasons.

This system controlling, as it does, the supply and distribution of heat makes its fuel saving in temperature control.

Outside weather conditions determine inside heat requirements. The one is the cause, the other the effect, and while there is a time-lag between cause and effect, the need for a heat supply which can be varied to follow weather fluctuations is none the less imperative for satisfactory heating. This need is met in the Dunham Sub-atmospheric Steam Heating System.

The calculated maximum heat loss from a building at "design basis" conditions determines the amount of radiation which must be installed. This radiation is usually sufficient to keep the building warm during coldest winter weather when filled with steam at 2 pounds pressure. Heat losses may be reduced 50, 75, or 90 per cent below this maximum during mild weather, yet no reduction can be made in the radiation, therefore, **unless the system provides control of the heat output from the radiators,** the results are overheating, discomfort and extensive window opening during most of the heating season. Overheating increases fuel consumption for the entire season from 25 to 50 per cent (or more) in excess of that which should actually be supplied to maintain a desirable inside temperature.

APPLIED TO EXISTING BUILDINGS

The System is applicable to existing buildings as well as to new projects. Excessive heating costs, unsatisfactory heating service or wear and tear on present equipment may make the consideration of a "change-over" worthwhile in such buildings.

The survey of a consulting engineer or contractor may indicate that a "change-over" is a better investment than a straight replacement. In many instances a "change-over" proves to be the economical and permanent solution of such problems as uneven heating, faulty circulation, necessity for excessive steam pressures, noise or other operating difficulties.

The cost of "change-over" installations varies with the type of heating system already in service. The fact that fuel or steam costs are considerably higher than they would be under Sub-atmospheric operation is not in itself sufficient reason for a "change-over" recommendation. The important consideration—to the owner—is the ratio of savings to the cost of making the "change-over."

We will gladly co-operate with architects, consulting engineers and contractors in supplying data as the basis for the surveys upon which modernizing recommendations can be made to clients.

APPLYING THE SUB-ATMOSPHERIC PRINCIPLE—In "change-over" work the effort is made to use as much of the existing equipment as will permit satisfactory operation and thus to reduce the extent and costs of alterations.

Existing piping and radiation throughout the building can normally be utilized without change after being checked for tightness and grading and proper distribution of radiation. In such cases a practical and economical approximation of "Differential" standards of comfort and savings is secured by adopting the Sub-atmospheric principle and method of steam heating.

Dunham Sub-atmospheric Steam Heating standards are sufficiently flexible for practical application to obsolete two-pipe vacuum return line systems, gravity steam systems and to one-pipe steam systems.

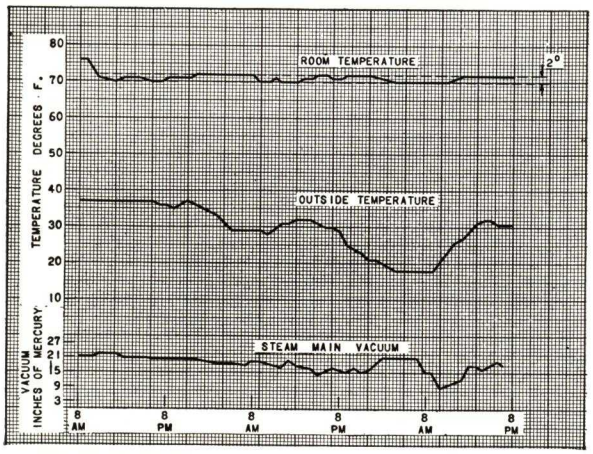
APPLIED TO

AIR CONDITIONING AND VENTILATION

The Differential principle of a variable rate of heat transfer by variation in the steam temperature and volume is well adapted for application to the air (blast) heating equipment systems for institutional and other types of buildings.

Satisfactory control of the rate of heat transfer to the air distributed by such a system is the prime requisite for satisfactory operation.

The application of Sub-atmospheric Heating to this type of service gives a basic control of the heat output from 100 per cent capacity to zero by its inherent ability to reduce heat emission.

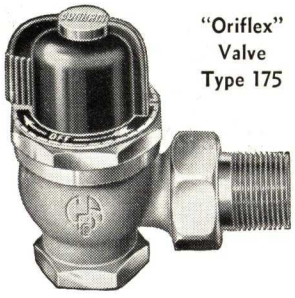


CONTROL RECORD OF AIR CONDITIONED BUILDING USING THE DIFFERENTIAL SYSTEM

TYPE "ME" UNIT HEATER AND CIRCULATING UNIT

Styled for tomorrow—available today—incorporating many innovations—developed from the eminently successful Type "M" heater introduced seven years ago. Cabinet completely conceals all piping, wiring and operating parts, yet all are easily accessible. Essentially a refined recirculating type unit heater, it may also be used to perform the functions of air conditioning—heating, cooling, circulating, cleaning, de-humidifying, and humidifying the air which it handles noiselessly. Recent research in air-movement equipment provides this Type "ME" unit heater, rounding out a complete line of heating and cooling units in this field.

THE ORIFLEX VALVE



"Oriflex" Valve Type 175

Prior to the development of the Dunham self contained adjustable orifice valve, balancing the heating system required a series of time-consuming operations—(1) the valve had to be disconnected from the radiator. (2) A regulating plate (orifice) inserted. (3) The valve reconnected to radiator—before testing for "balance" could be made. With "Oriflex" the valve does not have to be disconnected: merely remove medallion, insert key on adjustment stem thus made accessible and adjust the orifice (calibrated guide surrounds the stem), replace the medallion—that's all.

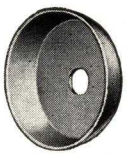
Where costs demand a lower priced valve, a standard Type 200 valve with regulating plate may be used on low duty systems.

Remove Medallion

Insert Key and Turn to Desired Setting

Adjustment Completed, Replace Medallion

Type 200



Regulating Plate

Dunham Sub-atmospheric Steam Heating may be utilized for either High Duty or Low Duty service and be either automatically or manually controlled as described on page two.

A TYPICAL SPECIFICATION

1. **THE GENERAL CONDITIONS** governing this work shall be those established as standard by the American Institute of Architects.

2. **CONSTRUCTION AND MATERIALS.** The heating installation proposed includes the furnishing, delivery and erection of all necessary material, which shall be first class in all particulars and in accordance with the specifications, heating plans and manufacturer's details.

3. **INSPECTION.** The contractor shall allow the C. A. Dunham Company's representative to inspect the installation and shall lend any assistance necessary to expedite and perfect the work.

4. **SCOPE OF WORK.** The contractor shall furnish and install a Dunham Sub-atmospheric Steam Heating System in accordance with these specifications, the accompanying plans and instructions issued by the manufacturer.

5. **PATENTS.** The contractor shall obtain and furnish owner with a license to install and operate the system specified above under U. S. Lettters Patent Nos. 1,644,114; 1,771,077; 1,983,218; 1,802,383 and 1,802,384.

NOTE: Use either (the following) 6A, 6K, 6M as required.

6A. AUTOMATIC CONTROL EQUIPMENT (Average Temperature Control). The contractor shall furnish and install in the supply main in the boiler room at the point shown on the plans, an electrically operated Dunham Sub-atmospheric Steam Control Valve governed by the average of Thermostats, a Heat Balancer, an Automatic Selector, all to be furnished installed and electrically connected with a Terminal Box, Junction Box, Differential Controller and Panel according to manufacturer's instructions. He shall also furnish and install an Automatic Pump Shut-off Switch.

6K. AUTOMATIC CONTROL EQUIPMENT (Key Room Control). The contractor shall furnish and install in the supply main in the boiler room at the point shown on the plans, an electrically operated Dunham Sub-atmospheric Steam Control Valve governed by *Thermostats, a Heat Balancer, an Automatic Selector, all to be furnished, installed and electrically connected with a Terminal Box**, Junction Box, Differential Controller and Panel according to manufacturer's instructions.

*Specify 1, 2, or 4 Thermostats as required.
**Omit Terminal Box when only 1 or 2 Thermostats are used.

6M. MANUAL CONTROL EQUIPMENT. The contractor shall furnish and install in the supply main in the boiler room at the point shown on the plans a Dunham Sub-atmospheric Pressure Reducing Valve and shall insert additional rods in the weight arms so that the weights will hang to a point six feet above the boiler room floor (to facilitate valve adjustment).

7. **DIFFERENTIAL VACUUM PUMP.** Furnish and install on a suitable foundation a size Dunham Differential Vacuum Pump with size accumulator tank equipped with float switch. The pump shall have the capacity to handle sq. ft. equivalent direct radiation under operating conditions of 2 lbs. gauge steam pressure to * of vacuum within the radiators. The suction of pump to be connected to accumulator tank outlet and discharge of pump connected to boiler (or other apparatus) as directed by the architect. Pump to have automatic starting equipment mounted on pump base. Pump is direct connected to a Motor wound for volts, phase, cycle. Pump impeller to be of bronze and capable of discharge head of lbs. at pump.

*25" for high duty system; 15" for low duty.

8. **DIFFERENTIAL CONTROLLER.** Furnish and install where directed and in accordance with manufacturer's installation and wiring instructions, a Dunham Differential Controller to govern differential vacuum pump operation to maintain a pressure differential between the steam and return piping.

9. **AUTOMATIC PUMP SHUT-OFF SWITCH** (for Automatic Control System). Furnish and install in heating system steam main approximately 50 feet from control valve a Dunham Automatic Pump Shut-Off Switch according to manufacturer's installation and wiring instructions.

NOTE: Automatic Pump Shut-Off Switch is optional on Key-Room Control installations. It is not used on Manual Control.

10. **WIRING INSTALLATION.** The Heating Contractor shall obtain from the C. A. Dunham Company detailed wiring diagrams of the control equipment and Differential Pump to be used on this installation. Service wiring will be brought to within 10 feet of both the Control Valve and the Differential Vacuum Pump from which point this contractor must arrange for the complete installation of all wiring circuits of control equipment and pump in accordance with C. A. Dunham Company's instructions. All wiring must be installed in accordance with local regulations governing this work.

NOTE: This (complete) paragraph applies only when 6A or 6K is used. On Manual Control (6M) installation omit the words "both the Control Valve and" in the 4th line (of paragraph 10).

11. **BOILER.** The steam boiler shall be a with guaranteed rating for at least sq. ft. of equivalent direct radiation. It shall be installed upon a suitable foundation and in accordance with boiler manufacturer's instructions. It shall be equipped with all necessary connections and trimmings, including a safety valve set to blow at 10 pounds pressure, a Dunham Compound Gauge 15 pounds by 30 inches vacuum, and a sensitive Damper Regulator. (Omit Regulator on gas-fired and automatic oil-fired installations.)

12. **SMOKE PIPE.** Connect boiler to chimney with suitable black iron smoke pipe gauge. Size to be as recommended by Boiler Manufacturer. Smoke pipe must be provided with hand stop damper. (Omit hand stop damper on gas or oil-fired installations.)

13. **PIPE AND FITTINGS.** Furnish and erect a system of steam supply and return piping. All piping to have tight connections, be properly supported and graded to insure free and noiseless circulation. Use wrought steelpipe (or wrought iron) and cast iron fittings of standard weight and quality. The ends of all pipes shall be reamed or filed. Use graphite and oil applied to male thread only for making up all pipe joints. Provide for expansion of mains and rises by using loop type expansion joints and swing connections wherever possible. In other cases provide approved all-metal packless expansion joints. Piping to be properly anchored.

14. All steam tappings in boiler shall be connected full size of tapping into a steam header which shall be dripped to the return header through a bleeder. Springpieces to steam and return mains shall be taken off the top of mains at 45 degrees. On down-feed systems take the springpieces from the bottom of overhead steam main at 90 degrees.

15. The end of each steam main, down-feed riser and drip point shall be drained into return main using a gate valve, Dunham Strainer and Dunham Trap as indicated on plans. Each drip shall flow by gravity into the return main. No lift connection shall be used.

16. Grade steam mains, return mains and drip piping ½" in 10 ft. down with flow. All steam supply springpieces, offsets in steam risers and runouts to radiators which grade in a direction opposite to steam flow shall in each case be installed not less than one size larger than the vertical pipe to which they connect and graded ½" per foot. Grade return springpieces ½" per foot.

17. Return mains shall be connected to the Accumulator Tank of Dunham Differential Vacuum Pump as shown in detail furnished by manufacturer. Lift connections must not be used except between pump and accumulator tank. There must be gravity flow of water and air from all drip and radiator traps and drip points to the accumulator tank.

18. Risers are to be run concealed or in the open as directed by the architect. All concealed piping must be tested and made tight at 15 lbs. water pressure before being concealed and covered.

19. All union connections, flanges, packing nuts on gate and globe valves and on gauge glass of boiler must be drawn up tight so as to prevent air leakage into system when under a vacuum. This work must be performed after system is completed and while it is working with a vacuum in both steam and return lines.

20. **FLOOR PLATES, SLEEVES.** Furnish approved floor and ceiling plates and sleeves on all pipes passing through floors or partitions.

21. **VALVES AND CHECK VALVES.** All shut-off valves in steam and return piping (excepting radiator inlet valves) shall be gate valves of approved make. Valves 2" and under shall be brass; 2½" and larger to be iron bodies, brass trimmed; 5" and larger shall be flanged. Check valves shall be horizontal or angle swing type of approved make with light weight brass disc, tested for tightness. Check valves shall be installed where shown on plans or details, and wherever necessary.

22. **RADIATION.** Furnish and install Dunham Concealed Radiators (or cast iron direct radiation) of type and size shown on plans.

23. **RADIATOR TRAPS AND VALVES.** Each radiator shall be provided at its return outlet with a Dunham D Series Radiator Trap of suitable size for satisfactory operation. The outlet of these traps to be connected to the return piping. A Dunham "Oriflex" Packless Radiator Valve of proper size, shall be installed at inlet connection of each exposed radiator. Each concealed radiator shall be equipped with a Dunham Adjustable Regulating Fitting, or with a Packless Valve and a Dunham Regulating Plate in accordance with instructions furnished by manufacturer.

24. **PAINTING.** All Exposed Piping, and parts of Boiler and radiators shall be painted as directed by the architect. The paint must be applied when the entire system is under vacuum.

25. **COVERING.** Cover all steam mains and their springpieces with four-ply, 1" thick asbestos sectional covering secured in place with metal bands. Fittings to be covered with asbestos cement. Cover all steam and return risers and other piping run concealed in outside walls or concealed in partition within 18" of outside wall, with two-ply, ½" thick asbestos sectional covering. Cover boiler as specified by boiler manufacturer.

26. **FINISHING UP.** Thoroughly blow down and clean out the System under 5 lb. steam pressure, wasting condensate to sewer. After this, close valve in steam main and surface blow off the boiler through sfety valve tapping at 5 lb. pressure, supplying make up water constantly, for at least two hours. Then, extinguish the fire, entirely drain the boiler and allow it to cool before filling with fresh water.

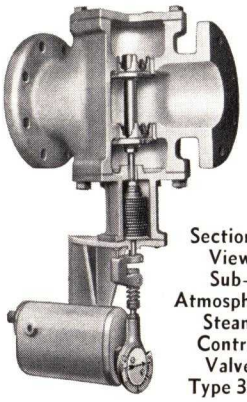
27. **TEST.** When System is finished and cleaned, but prior to covering of pipes, it shall be tested for tightness by the Contractor who shall furnish labor and materials for performing the following test: obtain a vacuum of 15 inches on a cold system by operating the Differential Vacuum pump. Stop the pump. After two hours, there shall remain ten inches vacuum on the system. System shall be considered cold five hours after steam was last on the system.

28. **GUARANTEE.** The Heating Contractor shall guarantee the apparatus installed to circulate steam thoroughly through every radiator without noise, with a vacuum of * in steam main. If the installation shall fail to accomplish this guarantee by reason of any defect developing within the first heating season due to faulty material or workmanship, The Contractor shall remedy such defect at his expense within reasonable time after notice.

*25" for high duty system; 15" for low duty.

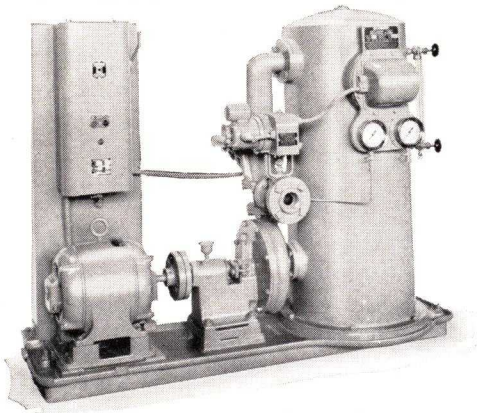
29. **FINALLY.** Nothing herein contained shall be construed to relieve the Contractor from making good and perfect work in all details of construction.

MAJOR PARTS OF A SUB-ATMOSPHERIC SYSTEM

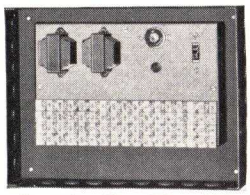


Sectional View Sub-Atmospheric Steam Control Valve Type 379

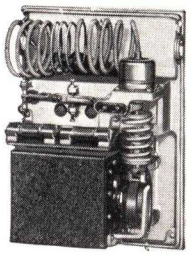
Manual Control Sub-atmospheric Steam Valve Type 375



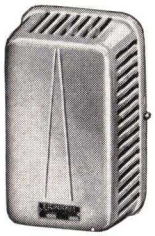
Differential Pump, Type DV Which Is Supplied with Accumulator Tank (not shown)



Junction Box, Type 373



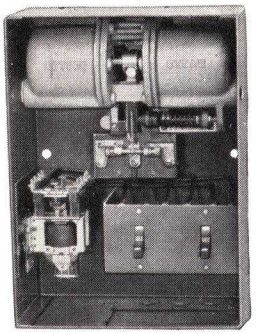
Heat Balancer, Type 386



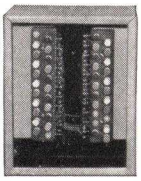
Automatic Selector, Type 261

Thermostat, Type 396

Panel



Controller, Type 389

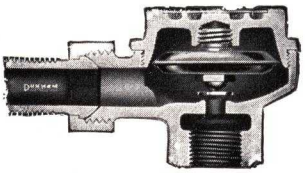


Terminal Box, Type 395

"Oriflex" (Adjustable Orifice) Radiator Valve Type 175 (See Page 9)

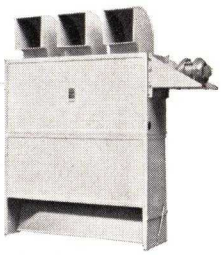
Wheel Handle Packless Radiator Valve, Type 200

Regulating Plate, Type 192, Used with Valve 200



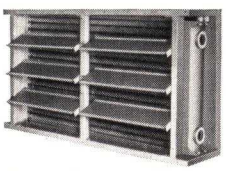
Sectional Differential Radiator Trap

Some of the Other Products Built by Dunham



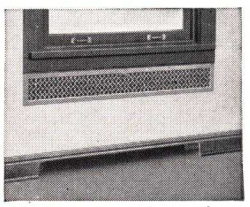
Type "R" Unit Heater

Type "V" Unit Heater



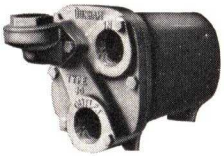
Type "D" Unit Heater

Type "M" Unit Heater



Concealed Radiator, Plaster Front

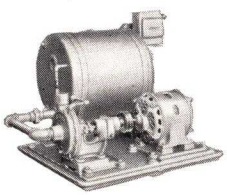
Double Seated Pressure Reducing Valve



Float and Thermostatic Trap

High Pressure Trap

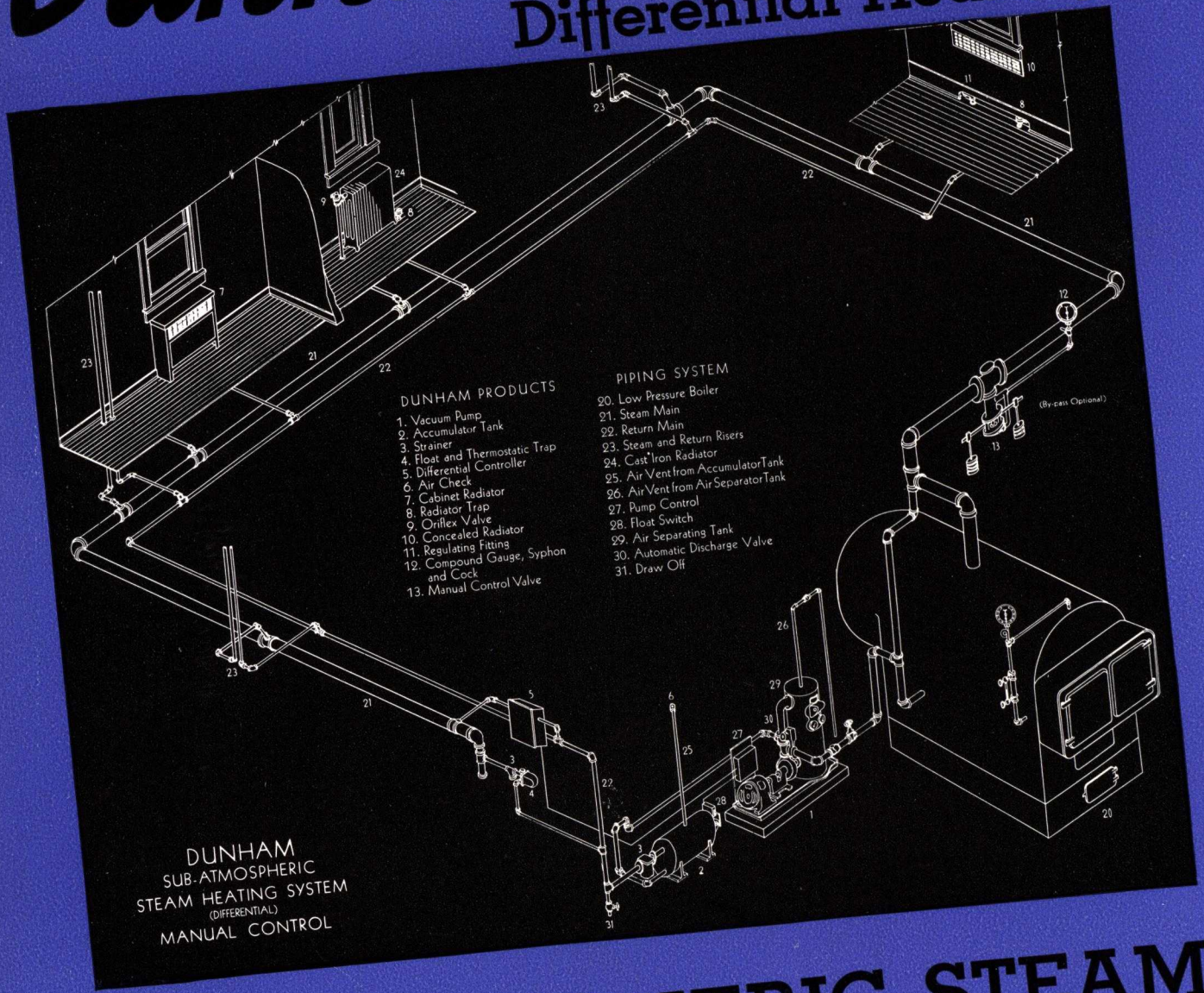
Medium Pressure Trap



Condensation Pump and Receiver

Single Seated Pressure Reducing Valve

Dunham Differential Heating



SUB-ATMOSPHERIC STEAM HEATING SYSTEM

C. A. DUNHAM COMPANY
450 EAST OHIO STREET, CHICAGO, ILLINOIS

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SECTION 26

CONTINUED ⟶

THE FULTON SYLPHON COMPANY

Manufacturers of Sylphon Automatic Temperature Controlling Instruments and Packless Expansion Joints

KNOXVILLE, TENN.

SALES REPRESENTATIVES IN PRINCIPAL CITIES

Products

HOT WATER SUPPLY: Temperature Regulators for storage water heaters, Thermostatic Water Mixers, Steam-Water Mixers. REFRIGERATION: Regulators for Control of Refrigerating Rooms and Boxes, Drinking Water Cooling Systems, etc. AIR CONDITIONING: Automatic Radiator Valves (both self-contained and electric types), Temperature Regulators for Duct Type Heating Systems, Unit Ventilator Controls, Unit Heater Controls, Thermostats, Damper Motors. EXPANSION JOINTS: Packless Expansion Joints for Heating and Plumbing Risers. PRESSURE REGULATION: Pressure Reducing and Regulating Valves.

General Information

Fulton Sylphon Products depend upon the famous Sylphon Metal Bellows for their superior, trouble-free service and long life.

Over thirty-five years ago, THE FULTON SYLPHON COMPANY originated this bellows—a precision-built, seamless, jointless "miracle in metal."

By continuous engineering study and intimate contact with heating and refrigeration problems, this Company has used this efficient, practically indestructible bellows in the development of a line of temperature control and heating specialties known today as a standard of quality.

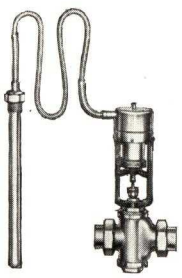
In attaining and maintaining this leadership, THE FULTON SYLPHON COMPANY'S plant has been extended until today it is one of the largest in the world, specializing in the manufacture of this type of equipment.

Every phase of the quality production of Sylphon products from raw materials to the finished product is scientifically controlled in this plant. A unique testing laboratory is maintained as a proving ground where every Sylphon product is subjected to conditions duplicating the most strenuous actual service in the field before approval for shipment.

It is with the knowledge of these resources behind the Fulton Sylphon line that many architects and engineers prefer, whenever possible, to specify Fulton Sylphon equipment. For they know by experience that permanent satisfaction will always be assured.

HOT WATER SUPPLY

No. 923 Temperature Regulator — For controlling temperature of water in heaters, open or closed tanks and various types of equipment. Operation is unaffected by temperature fluctuations at the valve, either above or below bulb temperature. Neat. Compact. All parts, except steel adjustment spring, made of non-ferrous metals. May be installed in any position. Ranges from 40°-80° F. to 290°-330° F. One of a complete line of Regulators for water temperature control purposes. Write for Bulletin SAC-20.

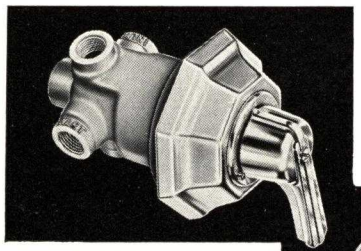


No. 923 Temperature Regulator

Sylphon Thermostatic Water Mixers—Utilize hot water from any storage tank or instantaneous heater, and effectively regulate the amount of cold water required to temper it to the desired degree, actually mixing the hot and cold water together before delivery. They not only save hot water, but effect increased capacity of storage tanks by permitting water to be heated to a higher temperature.

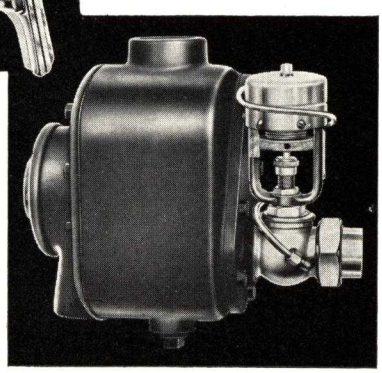
Readily adjustable for any desired water temperature, this temperature remains constant in spite of fluctuations in supply water temperatures or pressures.

Capacities ranging from 5 to 131 g.p.m. Bulletin SAC-40.



No. 905 Thermostatic Water Mixer

An individual shower mixer with temperature selector handle permitting setting for any desired, thermostatically maintained, temperature from cold to a safe maximum temperature of hot water. Unaffected by variations in pressure of supply water



No. 902 Sylphon Thermostatic Water Mixer

14 to 131 g.p.m. depending on water pressure

REFRIGERATION CONTROL

A complete line of Sylphon Refrigeration Controls, adaptable to the regulation of temperatures down to 40° below zero and wherever brine is used as the refrigerant, provides a broad selection for refrigeration or drinking water cooling service.

Latest development of Fulton Sylphon Engineers is a positively "freeze-proof" valve (illustrated at right on the popular Sylphon No. 945-Z Regulator). It has been proven that this design will assure stem working freely without frosting even when subjected to temperatures as low as 70° below zero. Bulletin SAC-20.

No. 945-Z Regulator

Showing detail of "freeze-proof" valve stem

PACKLESS EXPANSION JOINTS

The Sylphon Packless Expansion Joint eliminates useless building height, expensive construction and non-revenue producing space. It prevents costly leaks and repairs, requires no repacking, and because it is always tight, it allows the heating system to operate at full efficiency. Two types for steam (No. 110), and for water (No. 111). Thousands are in use in many prominent buildings. Write for Bulletin SAC-140.

No. 110 Sylphon Expansion Joint

PRESSURE REGULATION

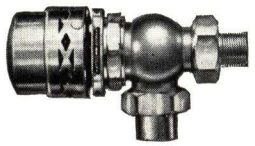
No. 955—Sylphon Interlocking Valve is a safety appliance designed to protect oil-fired furnaces by shutting off oil flow should atomizing pressure fail or fall below the required minimum. Approved by the Associated Factory Mutual Fire Insurance Companies and preferred by the leading engineers for its positive unfailing protection. Bulletin SAC-100.

No. 952—This regulator of all-metal construction may be used as a pressure reducing valve as well as a uniform pressure regulator. It may be installed in any position and is easily adjusted for different pressures. Bulletin SAC-100.

No. 955 Interlocking Valve

SPACE HEATING AND AIR CONDITIONING CONTROL

No. 885 Automatic Radiator Valve—For exposed radiation. Small, neat, finely finished, adjustable to room temperature desired. Simply replace ordinary radiator valves with these Sylphon Automatic Regulators—no wiring, piping or auxiliary equipment are required. These valves answer the demand for an inexpensive means of providing accurate, dependable space temperature control in rooms, sections or throughout large buildings, new or old. Similar type valves for concealed radiation also —get Bulletin SAC-80.

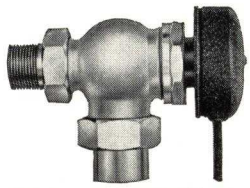


Sylphon No. 885 Automatic Radiator Valve

No. 892 Automatic Radiator Valve—For enclosed radiators. With manual shut-off. Hand wheel is provided so valve may be opened or closed manually regardless of operation of automatic control; but automatic feature prevents room temperature rising above point for which adjustment is set. Automatic control can be set at any desired point between 40° F. and 90° F. For steam pressures up to 15 lbs.; any two-pipe steam, vapor or vacuum system properly trapped and where there is no back pressure in the system. Bulletin SAC-80.

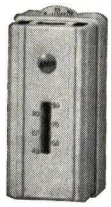
Sylphon No. 892 Automatic Radiator Valve

No. 890 Electric Radiator Control Valve—For either exposed or concealed radiation. Similar in appearance and action to Sylphon Automatic Valves, but operated by an electric wall thermostat. The closing of the thermostat circuit energizes a low voltage electric heater coil surrounding a bulb containing a volatile liquid. This liquid expansion causes pressure on a bellows in the valve head operating the valve. This provides radiator valve control from a remote location, permits regulation of several radiators from a single thermostat, enables a time switch to be installed, if desired, offers effective zone control of large areas at a fraction of the cost of conventional motor-operated valve systems. Bulletin SAC-70.



Sylphon No. 890 Electric Control Valve

Sylphon Thermostats—Heat accelerated and on-off types, with or without night setback feature and with or without anticipating feature. Simplest types close contacts on increase in room temperature, open on decrease in temperature. Anticipating types by making and breaking contacts before the valve can fully open or close, have a modulating or throttling effect. This causes valve normally to "float" in an intermediate position, giving very close control; opening or closing tight only when extreme temperatures are encountered. For 20-25 volts a-c. or 110 volts a-c. or d-c. circuits. Complete information in Bulletin SAC-70.

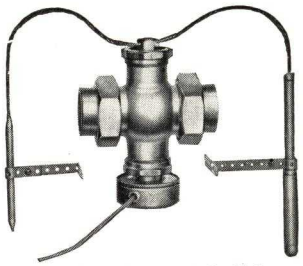


Sylphon Thermostats
Several types for various services

No. 889-E Unit Ventilator Control—An electrically and mechanically operated dual valve developed for use in unit ventilators. The electric side of the valve utilizes the same "heat motor" as used in Sylphon Electric Radiator Valves and is operated by a wall thermostat in the room. This valve operates to bring room temperature up to desired level during heating up period, and maintains desired temperature during period of "thermal balance".

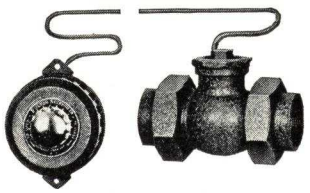
The mechanical side of the valve is operated by a thermostat bulb placed in the discharge air stream and is known as the "minimum air stream thermostat."

This modulates the valve, when the electric thermostat is "off", to prevent discharged air from falling below a predetermined minimum temperature, eliminating objectionable cold drafts. Suitable for steam pressures up to 15 lbs. and for any two-pipe steam, vapor or vacuum heating system.



Sylphon No. 889-E Unit Ventilator Control

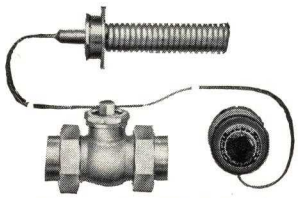
No. 7 Temperature Control—A self-contained, self-powered regulator for controlling unit heaters, wall or ceiling type radiators, heating coils in duct-type heating systems, etc. A sturdy, practically indestructible control, easily and quickly installed, holds temperatures within close limits. Valve is placed in steam line to one or a gang of heaters, thermostat is mounted on wall or column. Operation is entirely mechanical. The No. 7 Regulator is designed for use on regular heating pressures up to 15 lbs. Similar regulators, Nos. 7-2 and 7-3 for 50 and 75 lbs. pressure are also available. Suitable for temperatures up to 170° F. Bulletin SA-50.



Sylphon No. 7 Temperature Control

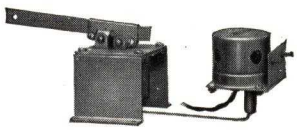
No. 928-C Temperature Regulator—For temperature control of air or gases. A sensitive, compact regulator, especially suited to control of duct temperatures. Bulb is a series of copper coils, sensitive to slightest change in air temperature, mounted through duct wall. Small over-all dimensions. Convenient adjustment.

No exposed operating mechanism. Perfect regulation. An ideal regulator for use in inaccessible places. Three types for 15, 50 and 75 lbs. steam pressures and temperatures not exceeding 170° F.



Sylphon No. 928-C Duct Temperature Regulator

No. 371 Damper Motor—A positive type motor for on-and-off control of dampers. Operation may be controlled by room thermostat, by hand operated switch, by a motor starting switch, or other means. Motor, safety type, returning to closed position in event of current failure. Heat-motor bulb and damper motor itself in separate units—easy to install. Can be located where extremely low temperatures exist, provided "heater" is placed where not subject to temperature below 55° F. or above 100° F. Damper motor has adjustable operating lever. Write for descriptive literature.



Sylphon Damper Motor
(Self-operating and Electric types)

THE MERCOID CORPORATION

Complete Line of Automatic Controls

SOLE MANUFACTURERS OF THE MERCOID SWITCH

4201 Belmont Avenue, CHICAGO, ILL.
90 West Street, NEW YORK, N. Y.
25 Ivy Street, BOSTON, MASS.
3137 N. Broad Street, PHILADELPHIA, PA.

DISTRIBUTORS IN ALL PRINCIPAL CITIES

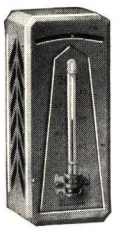
Mercoid Controls have a wide application in both the domestic and industrial fields. They are generally employed for the control of motor-driven automatic heating or refrigeration and air conditioning equipment, electric space or tank heaters, and for numerous industrial applications.

Equipped throughout with Mercoid sealed mercury contact switches—they cannot be affected by dirt or corrosion. The following are brief descriptions of several Mercoid Controls which are standard.

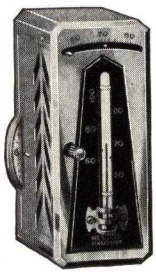
Sensatherm

A sensitive air type thermostat for low or high voltage requirements. Used for controlling automatic heating, refrigeration, or air conditioning equipment.

Furnished standard for low voltage to operate with the Mercoid Transformer-Relay. It can directly handle 20 watts or less on 110 or 220 volts without a relay. The standard range is 55° to 85° F. Other ranges are available. Total differential, 1° F. (plus or minus ½°).



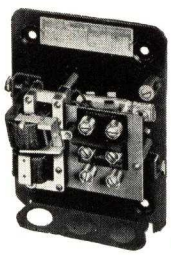
Size, 3 13/16 in. high, 1 11/16 in. wide, and 2¼ in. deep. Gold or chromium finish with thermometer. Dual Sensatherms available for day and night temperature regulation, also for heating and cooling operations.



Day-Night Sensatherm—This control meets the demand for a low priced, yet dependable day and night temperature control. It has all of the outstanding features of the regular Mercoid Sensatherm, combined with a hand wound timer mechanism that is easy to set and reliable in operation. Standard range 55° to 80° F. Total differential 1° F. (plus or minus ½°).

Standard finish: polished chromium with black enamel thermometer.

Type V Transformer-Relay



A reliable low voltage mercury contact relay, which also acts as a transformer inducing low voltage (24 volts) on the pilot circuit. Its construction does away with all hum and chatter. Equipped with carefully tapped and impregnated heavy duty coils.

Has a steel cabinet.

Available for 110 or 220 volts, 60, 50 or 25 cycle. Can also be furnished as a repulsion-relay for 110 or 230 volts d-c.

Pressure Control Type DA-31

A positive safety limiting device which is widely used on steam boilers. Also has numerous applications in the industrial field.

It is actuated by a specially designed Bourdon tube of great strength and elasticity. Has external independent adjustments, with high and low setting, each directly indicated on a visible calibrated dial.

A glance shows the pressure at which the instrument will open or close the circuit. Sealing or locking means provided as standard to prevent tampering.

Various ranges available.

Pressure Control Type DA-36

For control of hot water boilers, hot water storage tanks, indirect water heaters on steam boilers or close pressure regulation of vapor-vacuum systems. Has new double adjustment feature. With the wide range of adjustment and the ease of differential adjustment provided, it is necessary to carry only this one type instrument in stock to meet practically all requirements.

Various ranges available.

Mercoid Combined Pressure and Low Water Control Type DA-121

Protect Your Boiler at the Water Level

The Type DA-121 Mercoid Low Water and Pressure Control with the new double adjustment feature, is designed primarily for the protection of automatically fired steam boilers, to prevent the hazard of firing into dry boilers and also guard against building up excessive steam pressure.

Low water protection has become a necessity with modern automatic heating equipment.

Mercoid Stok-A-Timer

The Stok-A-Timer is a unique combination of the Mercoid Transformer-Relay and a self-starting synchronous timer mechanism, designed to maintain the stoker fire during the periods when thermostat does not call for heat. Dials are accurately graduated and all adjustments are made by hand without the use of tools. Interval adjustment can be set for ½ or 1-hour interval. Fire maintaining period is adjustable from 30 seconds to 12 minutes. This control is compact and neat in appearance.

Combination Fan and Limit Control Type M-80

Used with all automatically fired warm air furnaces using a fan or blower. This control protects the furnace from overheating and at the same time starts the fan when the furnace temperature is hot enough to deliver heat. Has dial with a separate calibration for each of the combined controls to facilitate setting the high and low operating temperatures. The indicating pointers also show the temperature in the furnace hood. Equipped with an adjustable flange which permits mounting the control on furnace hoods of various angles.

Complete Catalog Sent Upon Request

JOHNSON
Automatic Temperature and Humidity
CONTROL

for Heating - Cooling
Ventilating
Air Conditioning
Industrial Processes

JOHNSON SERVICE COMPANY

HERE IS INFORMATION:

Stripped of "sales-talk" and unnecessary descriptive matter, these pages attempt to present a brief "index" of Johnson apparatus for automatic temperature and humidity control applied to heating, cooling, ventilating, air conditioning, and industrial processes. A Johnson sales engineer will be glad to give you further information. There is no obligation. (See list of branch offices on back cover, page 12.)

SEE TABULAR DESCRIPTIONS:

For your convenience, essential points regarding each device are presented in tables on the following pages, with brief descriptions, in outline form. These descriptions, together with the "Bulletin" numbers and other data indicated in the tables, may be used with confidence in the preparation of specifications.

AIR CONDITIONING.....Pages 3 & 4
ROOM THERMOSTATS.....Page 5
DUCT THERMOSTATS.....Page 6
HUMIDITY CONTROL.....Page 7
VALVES.....Page 8
DAMPERS.....Page 9
CLOCKS & COMPRESSORS.....Page 10
ZONE CONTROL.....Page 11

ASK FOR BULLETINS:

For more detailed information, APPARATUS BULLETINS will be furnished on request. Some of them are referred to, by number, in this condensed catalog. There are many others, in this interesting and informative series. Simply tell our nearest branch what will be of interest to you.

SEE LIST OF OFFICES ON PAGE 12 (BACK COVER)

THE JOHNSON ORGANIZATION

The JOHNSON SERVICE COMPANY sells apparatus only for installation by its own trained mechanics. There may be other engineers and mechanics who are entirely familiar with automatic temperature regulation. Nevertheless, it is felt that no one will assume such complete responsibility for satisfactory installation as do the manufacturers. When apparatus is sold to others for installation, there is always the likelihood that responsibility will cease when the transaction is closed and the possibility that such concerns may go out of business. The JOHNSON SERVICE COMPANY has been in existence for more than fifty years, will continue to operate, and will take the same interest in a plant that is twenty-five years old as in its most recent installation.

There are twenty-eight direct branch offices in the United States. Each office has an adequate staff, consisting of branch manager, sales engineers, superintendent of installations, clerks, and mechanics. A stock of material for new installations and of parts for repair work is available so that service may be rendered on short notice.

The branch managers and sales engineers are technically trained men, familiar with the work of this company and conversant also with all phases of heating, ventilating, and air conditioning. None of them are agents, jobbers, or part-time representatives. Each is paid a salary and devotes his entire effort to the interests of the JOHNSON SERVICE COMPANY and its customers.

JOHNSON SERVICE COMPANY
MILWAUKEE, WISCONSIN and PRINCIPAL CITIES
MANUFACTURERS - ENGINEERS - CONTRACTORS
AUTOMATIC TEMPERATURE & HUMIDITY CONTROL

JOHNSON CONTROL FOR AIR CONDITIONING

JOHNSON CONTROLS FOUR ESSENTIALS Johnson automatic regulation is the proper solution of the operating problems presented by four of the essential features of a complete air conditioning system: Heating, humidification, cooling and dehumidification. Devices which have been manufactured and installed by the JOHNSON SERVICE COMPANY for fifty years, in one form or another, for the control of temperature and humidity in heating and ventilating installations, find exactly the same uses in modern air conditioning. See pages 5 to 10. Beyond that, the ever-present Johnson policy of "progress" is evident again in the development of many new devices. The result is a complete line of Johnson equipment for every requirement of air conditioning engineers, manufacturers, and contractors.

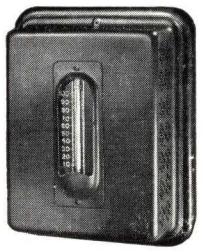
"SUMMER-WINTER" THERMOSTATS One of the requirements for automatic temperature control for air conditioning systems, is that certain instruments, sensing a rising temperature, must *close* the device which they control, during the heating season, and that those same instruments, on a rising temperature, must *open* those devices during the cooling season. The Johnson "Summer-Winter" room thermostat accomplishes this action. No complicated switching mechanism is required nor are two instruments necessary. Each "Summer-Winter" thermostat is equipped with two sensitive elements: "direct acting" for winter and "reverse acting" for summer. By changing the air pressure in the small compressed air "main" which supplies power to the thermostats, just as is done with the "Dual" thermostat described on page 5, Johnson "Summer-Winter" instruments are indexed from one season to another. The switching is done from a central point by a manually-operated switch or by a pilot thermostat which senses outdoor temperature.

A further interesting feature of the Johnson "Summer-Winter" thermostat is that the temperature setting for heating may be quite different from that for cooling. A separate dial is provided for each of the two sensitive elements. With the usual type of thermostat, this re-adjustment of operating temperature from season to season must be made *at each individual instrument*. The Johnson "Summer-Winter" thermostat is set permanently at *both* temperatures, and every instrument in the building is shifted from one to the other from a central point and in one operation. *See Bulletin T-311.*

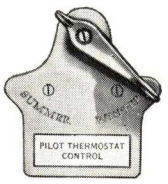
THE "SUMMER-WINTER" INSERTION THERMOSTAT A special form of the Johnson two-point insertion thermostat is provided for use where a duct-type instrument is required to perform the function of a "Summer-Winter" thermostat. Moreover, this form of Johnson insertion thermostat may be arranged for automatic shifting from one cycle to another. For example, acting as a pilot instrument and sensing outdoor temperature, it will arrange the entire temperature regulation system for "control of heating" until the temperature outdoors reaches 68°, change all apparatus to simple "ventilating control" until the temperature rises to 75°, and then shift to "cooling control" for higher outdoor temperatures. Many other applications for this unique device are readily apparent.

DIFFERENTIAL THERMOSTAT A great contribution to the science of air conditioning is the Johnson "Differential" thermostat. It is accepted by most authorities that it is preferable to maintain indoor conditions, by means of cooling systems, at temperatures which bear a "sliding relationship" to the outdoor temperature. The general concensus of opinion is that a temperature of 72° indoors is desirable when the outdoor temperature is 70°, rising, as the outdoor temperature increases, until cooling to about 80° is sought when it is 95° outdoors.

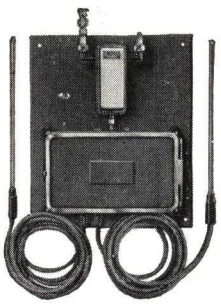
The Johnson "Differential" thermostat maintains that relationship. Further than that, it is adjustable, so that any desired relationship between the temperatures at two different points may be secured. In air conditioning work, one bulb of the "Differential" thermostat is mounted in a suitable location to sense the outdoor temperature, while the other bulb is located where it will sense the temperature in the conditioned space, usually measured most conveniently in a "recirculating duct." The "Differential" thermostat is described in *Bulletin T-304.*



SUMMER-WINTER THERMOSTAT

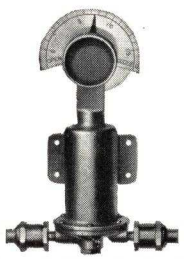


SUMMER-WINTER SWITCH



DIFFERENTIAL THERMOSTAT

REMOTE-READJUSTABLE SUMMER-WINTER THERMOSTAT



RE-ADJUSTING SWITCH

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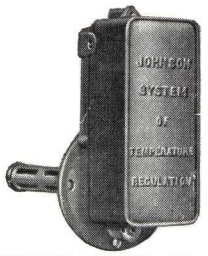
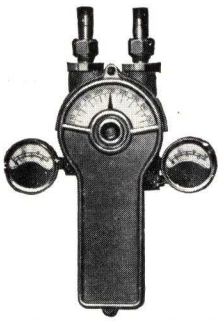
INSERTION AND IMMERSION THERMOSTATS

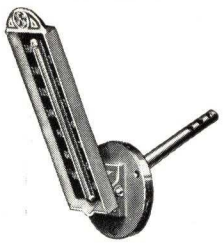


INSERTION THERMOSTAT

FOUR-POINT MULTIPLE INSERTION THERMOSTAT



CALIBRATED IMMERSION THERMOSTAT



"SUNRISE" DUCT THERMOMETER

TYPES: Standard Johnson insertion and immersion thermostats are shown in tabulation below. Special types available for air conditioning and process control, some of which are described on pages 3 and 4. Sensitive elements arranged for insertion through walls or into ducts and for immersion in tanks. Operating mechanism located outside, for ready adjustment and observation.

THERMOSTATIC ELEMENT: Invar rod enclosed in brass tube, perforated for control of air and other gases, solid for immersion in liquids. Maximum temperature 250° F.

KIND OF ACTION: Intermediate (gradual) for operation of dampers, throttling valves, etc. Positive (snap-action) for rapid movement, fully open to tightly closed.

TEMPERATURE ADJUSTMENT: (1) "Closed adjustment," with knob beneath cover, to prevent tampering, (2) "Open adjustment" with knob extending through cover and dial visible through window. Although all Johnson insertion and immersion thermostats have adjusting dials marked in degrees, some types (designated below as "Calibrated") have larger, easily-read dials for use where frequent and very accurate re-setting is required, as in process work.

SENSITIVITY: See tabulation below, expressed in terms of pressure change in branch line leading to controlled device for a change of one degree, F., in temperature sensed. For discussion of selection of proper sensitivity, see page 4. All "supersensitive intermediate" instruments equipped with adjustable sensitivity.

COVERS: "Model Calibrated"—$5\frac{3}{16}$" high, $2\frac{7}{16}$" wide, $1\frac{3}{16}$" thick. ½" pipe thread. All other immersion types—$6\frac{1}{16}$" high, $2\frac{7}{16}$" wide, $2\frac{5}{8}$" thick. 1" pipe thread. Insertion types—Same, with mounting flange 4" diam.

THERMOMETERS

"SUNRISE" INSERTION THERMOMETERS: Illustrated on this page. A high grade mercury thermometer for insertion into sheet metal ducts or through walls. A flange is provided so that the thermometer may be fastened to the wall or duct with screws. Made only in the angle pattern. A patented arrangement allows tilting through an angle of 45 degrees so that the scale of the instrument is readable even though mounted above the line of vision. Scales of various ranges of temperatures from —20° to 400° F. Shanks for duct mounting or for insertion through walls up to 24" thick.

"SUPERSENSITIVE" INSERTION THERMOMETERS: A high grade mercury thermometer for insertion into sheet metal ducts or through walls. Large V-shaped scale, tilted slightly, with magnifying tube, and screwed flange for mounting. Has a larger scale than the "Sunrise" thermometer, is generally more appropriate for high class engine rooms. Scales 30° to 240° or —20° to 120° F. Shanks for duct mounting or for walls up to 30" in thickness.

IMMERSION THERMOMETERS: Mercury column. Scale 6" long, ½" male pipe thread. Straight stem type, 40° to 240° F. with $1\frac{3}{16}$" shank. Angle type in various ranges from —20° to 260° F. and with shanks up to 12" in length.

DIAL THERMOMETERS: Various types of dial thermometers are supplied where that type is preferred.

PRINCIPAL TYPES OF INSERTION AND IMMERSION THERMOSTATS

Bulletin	Types	Kind of Action	Sensitivity	Length of Stem
T-316	Unit Insertion	Supersensitive Intermediate	Adjustable ½ to 8 lbs.	$6\frac{1}{4}$" to $49\frac{7}{16}$"
T-318	Unit Insertion	Positive (Snap-Action)	½ Deg. Differential	$6\frac{1}{4}$" to $49\frac{7}{16}$"
T-350	Multiple Insertion (2, 3, 4 pt.)	Positive, Int. or Combined	Same as T-316 and 318	$7\frac{1}{2}$" to $25\frac{1}{2}$"
T-320	Unit Airstream	Intermediate	Adjustable ¼ to 4 lbs.	$19\frac{13}{16}$"
T-317	Unit Immersion	Supersensitive Intermediate	Adjustable ½ to 8 lbs.	$7\frac{21}{32}$" to $43\frac{17}{32}$"
T-319	Unit Immersion	Positive (Snap-Action)	½ Deg. Differential	$7\frac{21}{32}$" to $43\frac{17}{32}$"
T-351	Multiple Immersion (2, 3, 4 pt.)	Positive, Int. or Combined	Same as T-317 and 319	$6\frac{11}{32}$" to $24\frac{7}{32}$"
T-326	"Model" Calibrated	Standard Intermediate	10 lbs. per deg.	14"
T-349	Calibrated	Standard Intermediate	5 lbs. per deg.	$13\frac{5}{16}$"
T-348	Calibrated	Positive (Snap-Action)	½ Deg. Differential	$13\frac{5}{16}$"

JOHNSON SERVICE COMPANY
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AUTOMATIC TEMPERATURE & HUMIDITY CONTROL

HUMIDITY CONTROL

HUMIDOSTATS

TYPES: Standard Johnson humidostats, both room and insertion types, are tabulated below. Remotely adjusted patterns for air conditioning control are described on pages 3 and 4. Humidostats sense relative humidity in the same manner that thermostats re-act to temperature and are equally dependable. Insertion humidostats are used to sense conditions in ducts and other chambers; room patterns for wall mounting in humidified spaces.
Johnson "Comfostats" are thermostats in which the temperature setting is re-adjusted by a humidity element. Room type *(Bulletin T-408)*. Insertion type *(T-409)*.

HUMIDOSTATIC ELEMENTS: Several types: bi-wood strips, animal membrane, multiple strands of human hair. Temperature and humidity limitations for each are tabulated below.

KIND OF ACTION: Intermediate (gradual) for modern heating, ventilating and air conditioning systems. Operate valves or dampers gradually, or hold them in intermediate positions to maintain humidities within one percent, if desired. Positive (snap-action) for "single-pipe" systems or high steam pressure, where rapid movement, fully open to tightly closed, is required.

HUMIDITY ADJUSTMENT: Room types—Same as described for "TEMPERATURE ADJUSTMENT" of room thermostats, page 5. Insertion types—Same as insertion thermostats, page 6. Adjusting dials have various ranges for different instruments. See tabulation below.

SENSITIVITY: See tabulation below, expressed in terms of pressure change in branch line leading to controlled device for a change of one percent in relative humidity.

COVERS: Same as for room and insertion thermostats, pages 5 and 6.

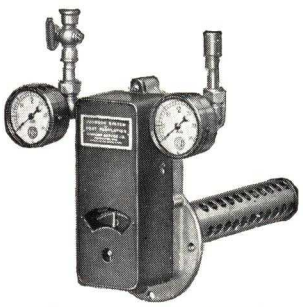
HUMIDIFIERS

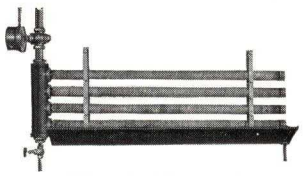
Johnson humidifiers have been in successful operation for many years in connection with ventilating and blast heating. The "grid" type has several branches of perforated pipe, wrapped with wicking. Low pressure steam moistens the wicking whenever the automatically controlled valve is open. The "pan" type humidifier is a brass steam coil immersed in a water-pan of copper with automatic float control. Humidity is controlled by humidostatic operation of a valve on the steam supply. Steam does not come in contact with the air. *Bulletins H-201 and 202.*

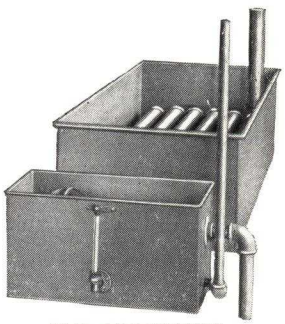
WET-BULB ATTACHMENTS

All types of Johnson insertion, immersion, and extended tube thermostats become "wet-bulb" thermostats when fitted with any of the various Johnson wet-bulb attachments. These attachments are of two types; wick or alundum tube, with or without circulating fans. All are described in *Bulletin H-310.* Johnson manufactures a relative humidity indicator *(Bulletin H-301)*, a whirling hygrometer (*H-303*), and a psychrometer with circulating fan (*H-302*), all designed for accurate reading of relative humidity.

ROOM HUMIDOSTAT


INSERTION HUMIDOSTAT


GRID HUMIDIFIER


PAN HUMIDIFIER

PRINCIPAL TYPES OF ROOM AND INSERTION HUMIDOSTATS

Bulletin	Type	Kind of Action	Sensitivity	Element	Humidity	Maximum Temperature	Dial Range
H-102	BW Room	Supersensitive Intermediate	1½ lbs. for each %	Bi-wood	10 to 60%	95°	30%
H-103	G Room	Supersensitive Intermediate	1 lb. for each %	Membrane	Up to 95%	110°	20%
H-105	BW Room	Proportioning Intermediate	Adjustable ¾ to 6 lbs.	Bi-wood	10 to 60%	95°	30%
H-155	W Insertion	Standard Intermediate	12 lbs. for each %	Wood cylinder	10 to 70%	150°	15%
H-153	H Insertion	Standard Intermediate	5 lbs. for each %	Multiple hair	Up to 95%	175°	20%
H-154	H Insertion	Supersensitive Intermediate	Adjustable 1 to 10 lbs.	Multiple hair	Up to 95%	175°	20%
H-151	G Insertion	Standard Intermediate	5 lbs. for each %	Membrane	Up to 95%	110°	20%
H-152	G Insertion	Supersensitive Intermediate	Adjustable 1 to 10 lbs.	Membrane	Up to 95%	110°	20%
H-156	W Insertion	Positive (Snap-action)	1% Differential	Wood cylinder	10 to 70%	150°	15%

JOHNSON SERVICE COMPANY
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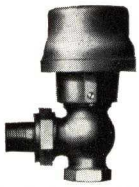
VALVES



RADIATOR VALVE

COIL VALVE
("SYLPHON" DIAPHRAGM)

MIXING VALVE
(RUBBER DIAPHRAGM)

BY-PASS VALVE
("SYLPHON" DIAPHRAGM)

TYPES: Johnson diaphragm valves are simple, rugged devices without complicated moving parts. Dependable diaphragms, built for long, uninterrupted service, operate the valve stem by means of air pressure transmitted through a branch line leading from a Johnson thermostat, humidostat, or switch. Strong, heavy springs of various pressure characteristics, as required, operate the valves in the opposite direction. There is no line of diaphragm valves as complete as that offered by Johnson: for steam, water, brine, ammonia, compressed air, and other liquids and gases.

SIZES AND PATTERNS: All standard sizes, as shown in tabulation below. Direct-acting "radiator valves" available in angle, globe, offset, corner, and straight corner: Direct-acting "coil valves" in angle and globe patterns: All others, globe pattern only.

KIND OF ACTION: Direct-acting "normally open," reverse-acting "normally closed," three-way mixing, three-way by-pass. Balanced types for high pressures.

SPRINGS: Strong springs of proper characteristics for pressure and type of service required.

DIAPHRAGMS: The seamless metal bellows in Johnson "Sylphon" valves was the first practical and reliable metal diaphragm adapted to automatic temperature control devices. The "Sylphon" diaphragm is especially desirable for valves in radiator enclosures and other locations where other materials might be affected by high temperatures . . . For those applications where a rubber diaphragm is desired, Johnson manufactures valves with diaphragms of special moulded rubber, super-aged and heat-resistant. The totally enclosed construction prevents corrosive action of fumes, keeps dirt away from internal parts.

DISCS: Various types of composition or metal discs are provided to suit the particular service which each valve is to perform. The special modulating disc in Johnson "streamline" valves produces throttling control and is valuable for all applications where modulating action is desirable.

BODIES AND SEATS: In the smaller sizes, valve bodies are high grade steam bronze metal with seat machined integral with the body. Large valves are cast iron with screwed-in seat ring of bronze. For high-pressure service and special applications, valves with monel metal or stainless steel trim are supplied.

FINISH: "Radiator valves" in nickel or chromium plate. Other valves, 2″ and smaller, plain brass bodies with tops dull black lacquer. Larger valves, iron bodies, black lacquer, overall.

CONNECTIONS: In general, all valves of sizes 2″ and smaller are for screwed connections and "radiator" types are provided with male union on outlet. Larger valves are available for either screwed or flanged connections.

DIAPHRAGM VALVES

Bulletins and Sizes				Type	Action	Service	Diaphragm
V-351	½″ to 1½″	V-352	2″ to 12″	Balanced	Direct	Steam or Liquids	Sylphon
V-353	½″ to 2″	V-354	2½″ to 12″	Balanced	Reverse	Steam or Liquids	Sylphon
V-175	½″ to 2″	.....	.....	Brine	Direct	Brine	Sylphon
V-93	½″ to 2″	.....	.....	Brine	Direct	Brine	Rubber
V-178	½″ to 2″	.....	.....	Brine	Reverse	Brine	Sylphon
V-91	½″ to 2″	.....	.....	Brine	Reverse	Brine	Rubber
V-135	½″ to 2″	V-136	2½″ to 6″	By-pass	3-way	Liquids	Sylphon
V-99	½″ to 6″	.....	.....	By-pass	3-way	Liquids	Rubber
V-125	½″ to 2″	V-126	2½″ to 6″	Mixing	3-way	Liquids	Sylphon
V-107	½″ to 2″	V-108	2½″ to 10″	Mixing	3-way	Liquids	Rubber
V-110	½″ to 2″	V-112	2½″ to 8″	Radiator and Coil	Direct	Steam	Sylphon
V-111	½″ to 2″	V-113	2½″ to 8″	Radiator and Coil	Direct "Streamline"	Steam	Sylphon
V-101	½″ to 2″	V-102	2½″ to 8″	Radiator and Coil	Direct	Steam	Rubber
V-103	½″ to 2″	V-104	2½″ to 8″	Radiator and Coil	Direct "Streamline"	Steam	Rubber
V-114	½″ to 2″	V-115	2½″ to 8″	Radiator and Coil	Reverse	Steam	Sylphon
V-105	½″ to 8″	.....	.....	Coil	Reverse	Steam	Rubber
V-150	½″ to 2″	V-151	2½″ to 8″	Radiator and Coil	Direct	Liquids	Sylphon
V-97	½″ to 8″	.....	.....	Coil	Direct	Liquids	Rubber
V-155	½″ to 2″	V-156	2½″ to 8″	Radiator and Coil	Reverse	Liquids	Sylphon
V-95	½″ to 8″	.....	.....	Coil	Reverse	Liquids	Rubber

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MILWAUKEE, WISCONSIN and PRINCIPAL CITIES
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AUTOMATIC TEMPERATURE & HUMIDITY CONTROL

DAMPERS

TYPES: Johnson dampers are "made to measure" in all sizes and in every known type, the most common of which are tabulated below.
Used widely for the regulation of air flow in ducts. The "proportioning louver" type of damper has been developed especially for air conditioning applications, adjacent blades rotating in opposite directions, reducing the quantity of air flowing without deflecting its course.

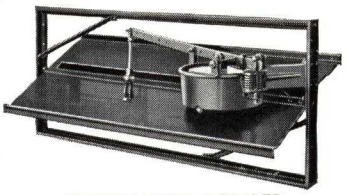
MATERIALS: Standard dampers have No. 16 gauge hot-rolled steel blades with flat steel frames and bracing sufficiently heavy to form a rigid assembly. Angle iron frames optional. Made also of galvanized iron, monel metal, aluminum, copper, rust resisting steel, etc. Blades and frames may be of different materials.

FINISHES: Standard is two coats of black lacquer. Special corrosion-resisting finishes on order.

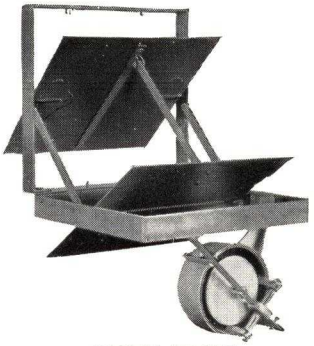
BEARINGS: Brass pins in steel bearings. Also ball bearings, all bronze, or cadmium plated steel ball races and stainless steel balls.

STOPS: Solid "lip", continuous on all sides of damper, or "pin stops," if preferred. Felted stops for quiet operation, on special order.

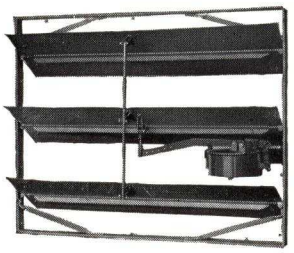
SIZES: Made to exact dimensions for each application. Louvered (multi-blade) construction recommended for all cases where single blade would exceed 12" in width. Intermediate bearing and frame-stiffener when axis exceeds 80" in length.



SINGLE-LEAF DAMPER



RIGHT ANGLE MIXING DAMPER



LOUVERED DAMPER

DAMPER MOTORS

Johnson damper motors, as simple and dependable as diaphragm valves, are capable of long service without attention of any sort.
"Sylphon" seamless metal or rubber diaphragm operates a lever attached to the damper by suitable linkage. Various types of brackets are provided, including a large variety of special patterns for all makes of unit ventilator cabinets.
The "double - diaphragm," pilot - type of damper motor can be depended upon to place a damper in a certain position and to hold it there, on each cycle of operation, for a given temperature sensed by the controlling instrument.

DAMPERS

Bulletin	Type
D-201	Double Mixing
D-203	Louvered
D-225	Proportioning Louver*
D-204	Round
D-202	Single-leaf

DAMPER MOTORS

Bulletin	Type
D-101	No. 1 & 2 "Sylphon"
D-103	No. 3 "Sylphon"
D-104	"Sylphon" Unit Ventilator
D-301	Rubber Diaphragm
D-401	Double Diaphragm Pilot Type

*Adjacent blades rotate in opposite direction for "proportioning" of air flow.

DAMPER MOTOR ("SYLPHON" DIAPHRAGM)

SWITCH CONTROL

Johnson pneumatic switches are made in many patterns for the operation of dampers from a remote point, for changing "Dual" thermostats from "day to night," and for placing thermostats and other devices in and out of service, as required.
Standard Johnson switchboards are made of oiled slate. Ebony asbestos, polished oak, and genuine or imitation marble are available on order. Various Johnson devices required at a central control point are mounted on such switchboards, including lever-type switches, gradual switches, clocks, air pressure gauges, recording gauges, etc.

SWITCHES

Bulletin	Type
S-101	Switchboards
S-201	Three-way Switch
S-203	Three-branch Throwover
S-205	Three-branch Three-way
S-215	Three-branch Four-way
S-217	Special Three-branch
S-209	Four-branch, Four-way
S-219	Multiple-step
S-220	Gradual
V-15	Single Solenoid for Air
V-14	Double Solenoid for Air
G-201	Air Pressure Gauges

DOUBLE DIAPHRAGM DAMPER MOTOR (PILOT TYPE)

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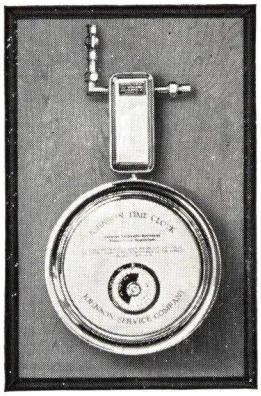
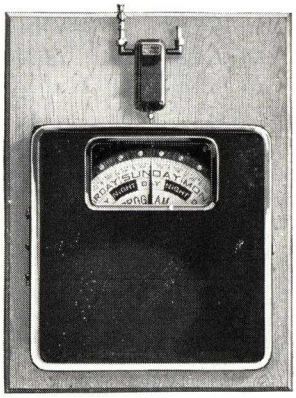
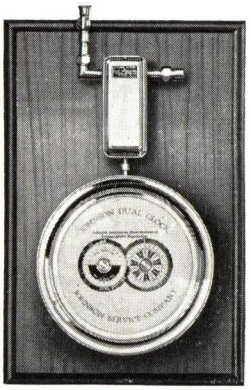
PNEUMATIC CLOCKS



DAY-NIGHT CLOCK



SEVEN-DAY PROGRAM CLOCK



COMBINED 24-HOUR AND 7-DAY CLOCK

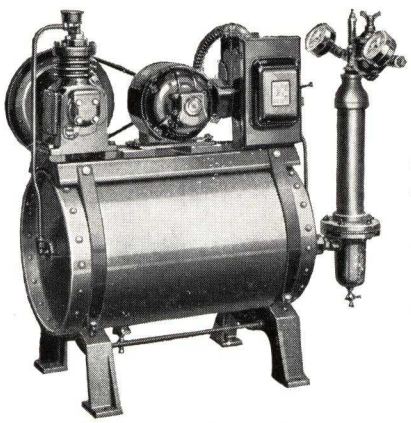
Johnson pneumatic clocks are driven by Telechron self-starting single-phase synchronous motors and are for operation by alternating current where the frequency is controlled accurately. For direct or for alternating current not properly controlled, electrically wound, spring-driven Johnson clocks are furnished. Each clock operates a pneumatic relay so that compressed air is placed in or exhausted from the "branch line" at certain intervals, for the operation of other Johnson devices. The principal use of these clocks is to change Johnson "Dual" thermostat control systems and Johnson zone control systems from day to night operation. There are many other applications where the operation of various devices is required at certain times. Johnson "Periodic Flush" systems *(Bulletin C-301)* offer remarkable economies. The "Day-Night" or 24-hour clock *(Bulletin C-302)* is used where the same operating program is repeated daily, "on" and "off." The "night" interval may be adjusted for any period between eight and sixteen hours.

The "24-hour and 7-day" clock *(Bulletin C-303)* also repeats the same program daily, but an additional dial provides interruption of the daily cycle for week-end service, for any period from 24 to 48 hours, every seven days.

The "Program Clock" *(Bulletin C-304)* permits a different operating program for each day of the week. The dial makes one revolution every seven days and is equipped with segments to allow successive operations each day at intervals of not less than fifteen minutes.

AIR COMPRESSORS

Johnson temperature control devices use compressed air at fifteen pounds pressure. Each device uses very little air, and a small compressor is amply large for an extensive control system. Johnson compressors represent the best in machine design and manufacture. They are automatic in operation and require no attention beyond ordinary care in oiling and cleaning.



2 in. "UNIT-TYPE" AIR COMPRESSOR

Each compressor is equipped with pressure governing switch, over-load time protective fuse plugs, enclosed safety knife switch, high grade electric motor, and V-belt drive. Unit-type assemblies include storage tank, pop safety valve, air filter, reducing valve, and gauges.

3 in. x 3 in. DOUBLE CYLINDER AIR COMPRESSOR

Size of Compressor	No. of Cyl.	Capacity Cu. Ft. Free Air per Min.	Storage Tank, Gallons	Horsepower of Motor	Bulletin
2″AA-5 ...	1	0.61	5*	⅛	A-303
2″A	1	0.61	10*	⅛	A-300
2″B	1	1.13	25*	⅙	A-301
3″ x 3″	2	2.55	30*	¼	A-302
4″ x 4″B ..	2	4.98	†	½ or ¾‡	A-307
4″ x 4″C ..	2	6.31	†	¾ or 1‡	A-307

* Made also without tank and stand. † Storage tank mounted separately. Not made in "unit-type." ‡ Larger motors when governors are set for 22 to 30 lbs.

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JOHNSON ZONE CONTROL SYSTEMS

ZONE HEATING The piping system which distributes steam—or hot water—to the radiators in a building may be laid out with such mains and branches that various sections may be served independently. It is not at all unusual to find a similar arrangement of piping in existing buildings, facilitating the application of "zone control." In many buildings, a single riser or a group of adjacent risers may be considered as the steam distributing system for a "zone." In other cases, it is easy to make slight changes in the piping arrangement so that satisfactory "zoning" is had.

Many attempts have been made to utilize a single thermostat to control a group of radiators. JOHNSON, as exclusive licensees under various F. I. Raymond patents, manufactures and installs the "Duo-Stat" as the logical answer to the question, "Where shall the thermostat be placed to control an entire heating zone?"

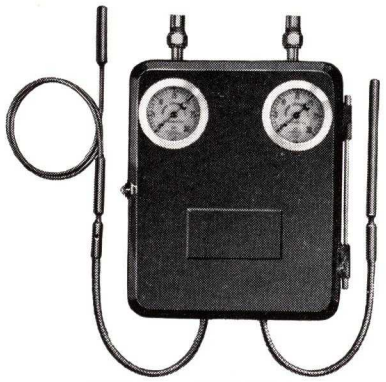
ECONOMY OF CONTROL FROM OUTDOOR TEMPERATURE

Radiators of sufficient heating capacity are provided to combat the coldest weather usually encountered in the locality. Consequently, only a part of that capacity is required during normally cold weather, and a very small fraction on mild days. Changing the amount of effective radiating surface in accordance with the outdoor temperature *has been* a difficult problem.

VARYING THE RADIATOR TEMPERATURE To illustrate the saving possible by reducing radiator temperatures as weather conditions moderate, it is safe to assume that an average outdoor temperature of about 45 degrees might be expected during the heating season in a locality where the amount of radiating surface is computed from a base temperature of 0 degrees. With a 45-degree temperature rise above zero, the required radiator temperature will be 90 degrees less than the full radiator at 210, or 120 degrees for comfortable conditions on an *average* heating day.

THE JOHNSON DUO-STAT

RADIATORS PARTIALLY FILLED The Johnson Duo-Stat operates according to the relationship between outdoor and radiator temperatures. Since the temperature of steam is approximately 210 degrees, it is not easy to produce a temperature lower than that throughout a radiator. However, the same result is accomplished if steam is kept in only a part of the radiator. It is found that the operation of any good one-pipe or two-pipe steam or vapor heating system can be controlled from a thermostatic bulb attached to one radiator in such a way that all radiators are kept partially filled with steam in mild weather. Moreover, a peculiar type of operation is obtained which tends to produce the same proportion of filling in all the radiators.



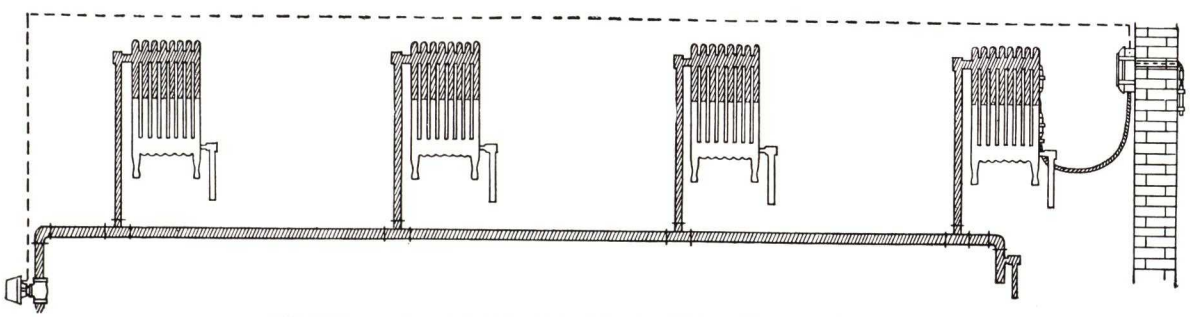
JOHNSON DUO-STAT

The Johnson Duo-Stat is equipped with two sensitive elements. One of the elements is placed outdoors. The other is clamped securely to a radiator, preferably to the last radiator at the end of the longest steam main in the particular heating zone. As a matter of fact, for steam, vapor or vacuum heating systems, the radiator bulb is divided into four sections, so that they may be placed advantageously to sense the average temperature of the heated and unheated portions of the radiator.

EVEN DISTRIBUTION OF STEAM

UNIFORM TEMPERATURE Room temperatures under Duo-Stat control are surprisingly uniform, with neither overheating nor waste of fuel. Even distribution of heat throughout each zone is possible because Duo-Stat control, from the relationship between outdoor and radiator temperatures, overcomes the disadvantage of cold steam mains by turning the steam on so often that the lines stay hot, and supplies steam to the system at sufficient pressure, whenever steam is required, to reach even the last radiators.

The booklet, "Johnson Zone Control," covers completely the applications of Johnson Duo-Stats for zone control.



TYPICAL DISTRIBUTION OF STEAM UNDER DUO-STAT CONTROL

BRANCH OFFICES

Albany, N. Y. . . . . 13 Northern Blvd.
Atlanta, Ga. . . . . 813 Bona Allen Bldg.
Baltimore, Md. . . . . 911 Cathedral St.
Boston, Mass. . . . . 20 Winchester St.
Buffalo, N. Y. . . . . 503 Franklin St.
Chicago, Ill. . . . . 1355 Washington Blvd.
Cincinnati, Ohio . . . . . 1113 Race St.
Cleveland, Ohio . . . . . 2142 E. 19th St.
Dallas, Texas . . . . . 2505 Commerce St.
Denver, Colo. . . . . 1230 California St.
Des Moines, Iowa . . . . . 1217 Grand Ave.
Detroit, Mich. . . . . 427 Brainard St.
Greensboro, N. C. . . . . 105 Piedmont Bldg.
Indianapolis, Ind. . . . . 333 N. Pennsylvania St.
Kansas City, Mo. . . . . 1031 Wyandotte St.
Los Angeles, Calif. . . . . 153 West Avenue, 34
Milwaukee, Wisc. . . . . 507 E. Michigan St.
Minneapolis, Minn. . . . . 922 Second Ave., South
New York, N. Y. . . . . 28 E. 29th St.
Oklahoma City, Okla. . . . . 1100 N. W. 38th St.
Philadelphia, Pa. . . . . 2853 N. 12th St.
Pittsburgh, Pa. . . . . 1238 Brighton Road
Portland, Ore. . . . . 1312 N. W. Raleigh St.
St. Louis, Mo. . . . . 2328 Locust St.
Salt Lake City, Utah . . . . . 602 Dooly Bldg.
San Francisco, Calif. . . . . 814 Rialto Bldg.
Seattle, Wash. . . . . 514 Colman Bldg.
Washington, D. C. . . . . 300 Bond Bldg.

Johnson Temperature Regulating Company of Canada, Ltd.

Calgary, Alb. . . . . 605 Second St., W.
Montreal, Que. . . . . 4343 Melrose Ave.
Toronto, Ont. . . . . 113 Simcoe St.
Vancouver, B. C. . . . . 550 Sixth Ave., W.
Winnipeg, Man. . . . . 259 Stanley St.

JOHNSON SERVICE COMPANY

Milwaukee, Wisconsin

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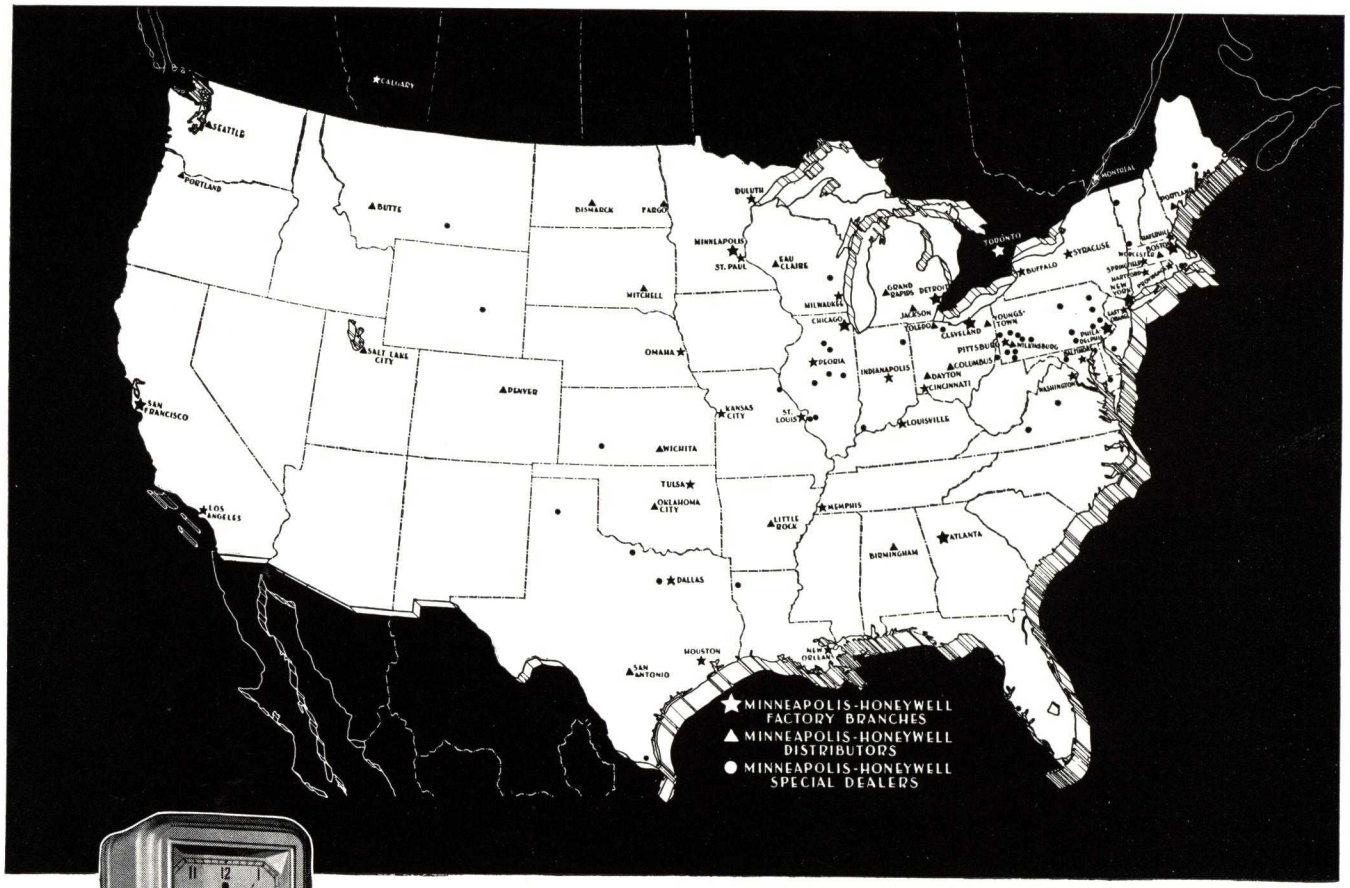
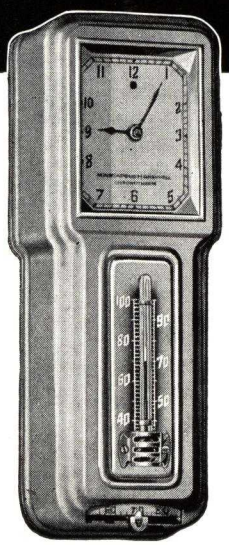
AUTOMATIC CONTROL SYSTEMS FOR HEATING, VENTILATING AND AIR CONDITIONING

MINNEAPOLIS-HONEYWELL





WHEREVER YOU ARE, from coast to coast, Minneapolis-Honeywell offers you its services and advice on automatic control systems for heating, ventilating and air conditioning. Minneapolis-Honeywell is in a position to furnish control systems for schools, homes, hospitals, commercial buildings, theatres, factories, office buildings—in fact for any application, large or small, new or old. Whether you desire control for an oil, coal or gas burner type of installation—a zone control installation, a ventilating system, or a complete air conditioning system, Minneapolis-Honeywell is equipped to serve you. The following pages have been prepared for the primary purpose of assisting you with your heating, ventilating and air conditioning problems. A competent M-H control engineer is always ready to work with you. He is as close as your phone.

AUTOMATIC CONTROL IS ESSENTIAL

Automatic control of heating, ventilating and air conditioning provides:

COMFORT—room temperature properly maintained.

HEALTH- no sudden changes of temperature.

SAFETY - all parts of heating plant properly safeguarded.

ECONOMY—saving of fuel and labor costs.

CONVENIENCE—no manual attention necessary.

In addition, complete automatic control will:

- Help to promote complete customer satisfaction.
- Help to lower operating and maintenance cost.
- Cost less if installed when building is erected, or remodeled.

STANDARDIZE ON M-H CONTROLS

1. Minneapolis-Honeywell offers you unified responsibility.

Minneapolis-Honeywell has the right control for every application—a complete service. From this single organization an architect can obtain every instrument known to the control field—electric, pneumatic or a combination of the two. Controls and control systems for bungalows or skyscrapers —from boiler room to radiator!

Minneapolis-Honeywell, through its Brown Instrument Division, also offers a complete line of recording, indicating and controlling instruments.

2. Minneapolis-Honeywell offers you a competent nation-wide engineering and service organization.

Minneapolis-Honeywell branch offices and distributors are conveniently located in over eighty cities throughout the country, and each is equipped to make complete installation of control systems on heating or air conditioning installations. Thoroughly trained men are available to recommend control sequence which will provide the desired results.

3. Minneapolis-Honeywell offers you the benefit of years of experience in every branch of the control industry.

Fifty years of experience in the field of electric controls for all types of buildings and residences, large or small!

Seventy-five years of experience in the field of indicating, recording and controlling instruments!

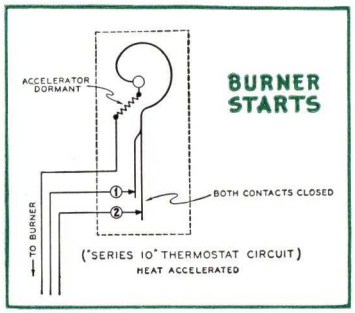
Thirty-five years of experience in the field of pneumatic control for commercial buildings, and large homes!

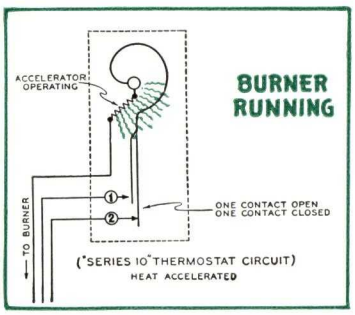
AUTOMATIC CONTROL SYSTEMS . . . . . .

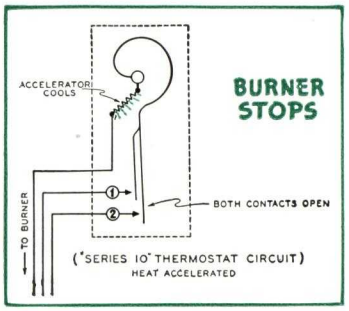
The popularity of Automatic Residential Heating Plants is based on a desire for the high degree of comfort, convenience and economy which has been made possible only through Automatic Control.

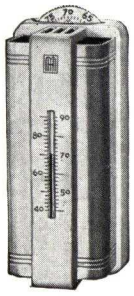
The Controls supplied as standard equipment for oil burners, gas burners and coal stokers—the thermostat, the limit control and the burner relay or valve—represent the simplest type of Automatic Control. They are the nucleus on which to build complete control systems that will achieve new levels of comfort, convenience and economy.

THE ACRATHERM *has "heat acceleration"*









THE ACRATHERM is a standard M-H "series 10" thermostat to which a medium for producing internal heat has been added. This heater element, or "accelerator," provides a means for maintaining stabilized temperatures, regardless of variations in outside weather.

By introducing artificial heat in the thermostat itself at the first indication of a room temperature rise, the "accelerator" serves to stimulate the action of the bi-metal element, thus preventing overheating, as well as "cold 70."

The room temperature must rise before artificial heat is applied to the thermostat, and the possibility of false shut down of the burner is completely eliminated.
In the "heat accelerated" Acratherm the elements of temperature and time are scientifically combined. Temperature drop starts the burner, temperature rise (both in fractional degrees) actuates the accelerator, and the adjustable differential in the Acratherm determines the time necessary for proper heat distribution throughout the space served.

LOWERED NIGHT TEMPERATURE *provides economy . . .*

Lowered night temperatures under automatic control mean fuel savings . . . warm rooms in which to dress . . . and actually 200 hours of additional sleep each year.

The M-H CHRONOTHERM automatically lowers the temperature control point at night and automatically restores it at some predetermined morning hour.

The resultant savings, as computed by the following formula, frequently provide sufficient savings to pay for the Chronotherm installation during the first heating season.

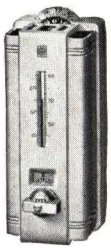
$$\text{Percentage of saving} = \frac{A-B}{A-C} \times \frac{D}{24}$$

A = Normal inside day temperature level.
B = lowered inside night temperature level.
C = average outside temperature level.
D = hours of night shutdown.

If complete automatic clock action is not desired, M-H recommends the Da-Nite Acratherm with which temperatures may be lowered at night by a slight manual adjustment and automatically raised at any selected morning hour.

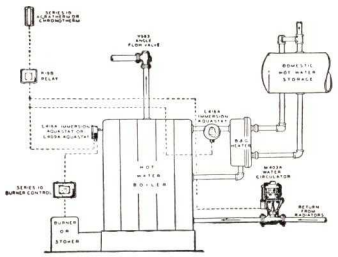
. . . . . FOR RESIDENTIAL HEATING

THE CHRONOTHERM also includes the feature of "Heat Acceleration" and provides lowered night temperatures automatically with no manual attention required. The Chronotherm not only automatically lowers the temperature, but also returns it to the normal level at a predetermined morning hour. These functions are repeated every day without manual attention. The Chronotherm is equipped with a telechron electric clock of the synchronous self-starting type.



THE DA-NITE ACRATHERM includes the "Heat Acceleration" feature of the Acratherm, and in addition provides lowered night temperatures by a simple "twist of the wrist." Return to normal temperature at any predetermined time is fully automatic. The Da-Nite Acratherm is equipped with a black setting wheel and winding knob—both on the same shaft—presenting the simplest of adjustment features and eliminating the necessity of arithmetical calculations.

YEAR 'ROUND HOT WATER *from the automatic burner*



Every automatically fired steam or hot water boiler, equipped with an indirect heater, can furnish a plentiful supply of domestic hot water at low cost, all the year around, in summer as well as in winter, with a Minneapolis-Honeywell summer-winter control system. Consider these advantages of a summer-winter hot-water control system:

1. Plentiful supply of low cost hot water.
2. Year around, 100% use of investment.
3. Constant use prevents boiler and burner deterioration.
4. Summer use prevents basement dampness.

The illustration at the right clearly shows how simple it is to install a summer-winter domestic hot water system. For particulars consult a Minneapolis-Honeywell engineer.

LO-WATER CUTOFF . . . *safety control for steam or vapor systems*

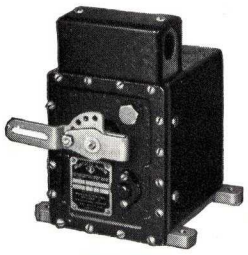
Steam and vapor systems are subject to numerous hazards which may result in serious damage due to firing a dry boiler. Defective and leaking castings, pipes, joints or fittings, clogged water heaters, or other defects are all too common causes of low water danger. In many localities ordinances exist which prevent the installation of a steam or vapor system without a low-water cutoff or its equivalent. Minneapolis-Honeywell Lo-Water Cutoffs remove these dangers by shutting off the heat supply in the event the water gets too low for safe operation.

The Lo-Water Cutoff or Duplexswitch meets all A.S.M.F. boiler code regulations, and is readily installed, as it utilizes a gauge glass opening.

RESIDENTIAL ZONE CONTROL *for larger homes*

In homes with servant quarters, guest rooms, garage or other sections, which do not all require the same temperature at the same time, control from one thermostat is not satisfactory from the standpoint of comfort and economy. The rooms of a home ordinarily occupied should be kept at 70 or 72°, the garage just above freezing, the servants' quarters should be kept cool during the hours when they are not in use, and so on. To accomplish these results, the heating system should be divided into sections and controlled under a system of space heating. Each building may be divided into suitable zones, based on exposure, occupancy and time requirements, so that the delivery of heat is adjusted to the demands of each zone. The saving in fuel which can be accomplished through zone control is obvious.

AUTOMATIC CONTROLS and CONTROL SYSTEMS for . . .



ELECTRIC
MODUTROL MOTOR

MINNEAPOLIS-HONEYWELL HAS THE RIGHT CONTROL FOR EVERY APPLICATION

"What type of control system should be used on an air conditioning installation?"

Obviously there can be no universal answer to this question since there is no specific type of control or control system which is sufficiently comprehensive to be suited to all installations.

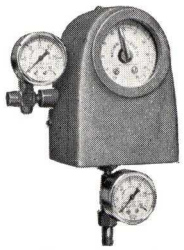
In line with its long established policy—the right control for each application—the Minneapolis-Honeywell Regulator Company offers to the heating, ventilating, and air conditioning industry a full range of automatic controls, control systems, and industrial instruments specifically designed to meet the most exacting requirements of the industry.

Over fifty years of careful planning and research have enabled Minneapolis-Honeywell to contribute many revolutionary developments to the field of temperature control including: Clock Thermostat Control with its advantages of lowered night temperature; the use of Limiting Devices for safeguarding a heating plant against excessive temperatures or pressures; Safety Devices for oil burners; "SERIES 10" with the exclusive feature of "Heat Acceleration"; True Modulation as offered by M-H proportioning instruments and the exclusive Series 90 circuit providing REAL flexibility in the control of air conditioning and commercial space heating.

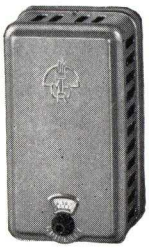
Through the Brown Instrument Division, Minneapolis-Honeywell offers a complete line of indicating, recording, and controlling instruments for all applications. The recent addition of the National System of Pneumatic Control rounds out the program of establishing a COMPLETE control service. Over thirty-five years of experience in the field of air operated controls has enabled the National Division to develop such outstanding features as HELMET SEAL protection with the totally enclosed tamper-proof and dust-proof thermostat design; and the exclusive METAPHRAM construction providing an air tight metal-to-metal seal for all air operated valves and damper motors.

These are but a few of the features which, coupled with the ability of Minneapolis-Honeywell to accept complete responsibility for all phases of automatic control, assure you of—*The Right Control for Every Application.*

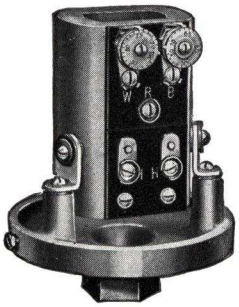
PNEUMATIC VALVE



PNEUMATIC SUBMASTER
INSERTION THERMOSTAT

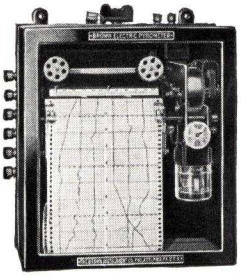


ELECTRIC
HUMIDITY CONTROLLER

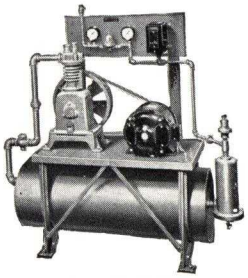


THE WEATHERSTAT
WITH COVER REMOVED

REFRIGERATION
PRESSURE
CONTROLLER

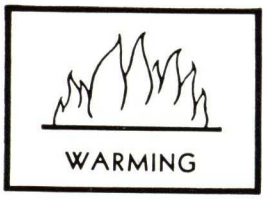


RECORDING PYROMETER



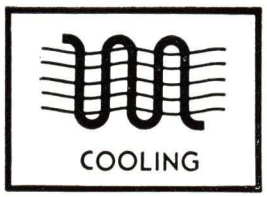
PNEUMATIC
COMPRESSOR

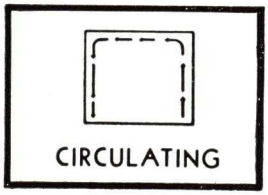
COMMERCIAL HEATING AND AIR CONDITIONING



TRUE AIR CONDITIONING PROVIDES SIX IMPORTANT FUNCTIONS, ALL OF WHICH MUST BE UNDER AUTOMATIC CONTROL

Only by controlling all six factors is it possible to obtain true air conditioning. Without simultaneous automatic control, these various functions may often be in conflict, and true air conditioning becomes impossible. Your client rightfully expects all of the advantages that you have made possible in the design of his system. With a complete Minneapolis-Honeywell air conditioning control system you can be assured of maximum performance and complete coordination of all the design features.





WINTER AIR CONDITIONING

The winter air conditioning cycle provides for the heating, humidifying, cleaning and distributing of air to all conditioned spaces. Automatic control is essential to the coordination of these functions. In order to assist you in analyzing the adequacy of any automatic control system, we are listing a few typical questions, the answers to which should be given careful consideration in writing air conditioning specifications.

1. Will the system take full advantage of outside air in mild weather?

The necessity of admitting outside air for ventilation purposes gives rise to problems which can be solved only by automatic control. The control system should permit the use of more than the minimum quantity of outside air when weather is mild, and should provide a means of proportioning the amount of outside air used in accordance with inside conditions.

2. Will the system expose the heating surface to the danger of freezing?

Any coil only partially filled with steam is in danger of freezing if it is subjected to outside air at a temperature of 32° or lower. Proper control will minimize this danger.

3. Will the system provide winter cooling?

The effect of solar radiation on exposed surfaces and such internal influences as light load, changing occupancy load, etc., frequently provides a definite need for cooling, even during the winter heating cycle. Under such conditions, outside air properly proportioned by automatic control will provide an economical cooling medium.

4. Will the system operate with maximum economy?

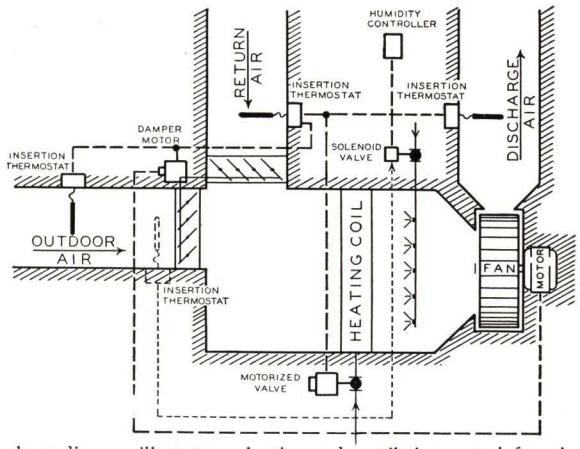
A carefully planned sequence of automatic control prevents wasteful and unnecessary operation of the air conditioning equipment and insures maximum economy.

5. Will condensation and frosting on windows and walls be prevented?

To prevent moisture condensation on windows and other exposed surfaces, it is necessary to lower the inside relative humidity control point as outside temperatures drop. A Minneapolis-Honeywell engineer can specify a system to accomplish this function automatically.

6. Will the system cause discomfort due to low discharge temperatures?

A low limit temperature controller installed in the fan discharge will prevent the circulation of air at temperatures below the comfort level.



The above diagram illustrates a heating and ventilating central fan air conditioning system. The control system is designed to use a minimum amount of outdoor air when heating, although when cooling is required, this amount is increased.

Minneapolis-Honeywell has prepared a group of standard control systems that cover the common arrangement of these controls. Ask for and specify these systems. Many different control systems can be designed for the same job but there is only one system that will be best from the standpoint of operation and economy.

SUMMER AIR CONDITIONING

During the summer air conditioning cycle the air must be cooled, dehumidified, cleaned and circulated. In establishing and maintaining a proper relationship between these factors, automatic control offers the assurance of continued efficiency and satisfaction.

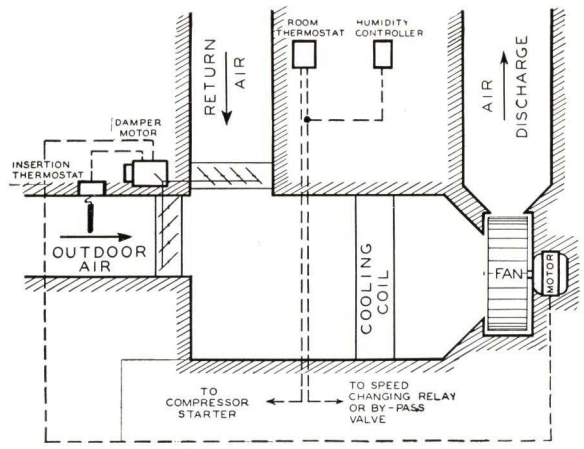
Here are a few typical questions that should be considered when specifying an air conditioning system for summer cooling.

1. **Is the system controlled to maintain optimum comfort conditions or an arbitrary temperature level?**
   Control from a single thermostat may give a constant dry bulb temperature without providing a constant comfort condition. The American Society of Heating & Ventilating Engineers, after exhaustive tests, has published data showing that the sensation of comfort does not follow constant temperature alone, but varies also with relative humidity and air motion. These tests show further that the feeling of comfort during the cooling cycle will vary with outside temperatures. It becomes necessary therefore to automatically re-adjust inside temperature control schedules in response to fluctuations of inside relative humidity and outside dry bulb temperatures. Minneapolis-Honeywell offers as standard equipment, control units to accomplish these functions. The relation between inside and outside temperature schedules may be set at any ratio desired, depending upon the type of building, duration of occupancy, and geographical location.

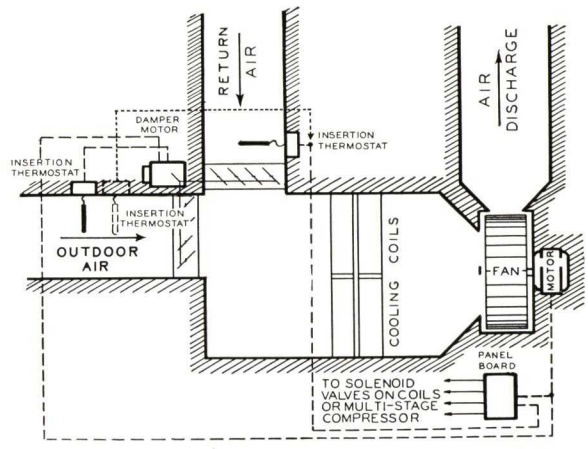
2. **Will the system take advantage of outside air when conditions are favorable?**
   At night and during the intermediate seasons, outdoor air will frequently be available at temperatures which will permit its use directly for cooling purposes. A well designed temperature control system will take advantage of this condition and will consequently effect a marked reduction in operating cost.

3. **Will your client get the most out of the system you design?**
   Without Automatic Control it is impossible to get the most out of any air conditioning system. The design of modern equipment provides inherent means for accurate regulation of factors which in the past have been neglected entirely, or left to chance. Precision control makes it possible to utilize engineering developments to their greatest advantage.

The Minneapolis-Honeywell control engineer in your locality is thoroughly qualified to analyze the equipment which you have specified and recommend the right system of control. The Minneapolis-Honeywell Regulator Company has prepared a number of standard systems of control. These standard systems are designed to provide dependable operation at a minimum installation and maintenance cost. Following are illustrations of two of these standard systems. If your arrangement is different, there is an M-H SYSTEM for you.



The above illustrates a direct expansion central fan system for cooling. The compressor is controlled by a thermostat and a relative humidity control which operates to effect a change in coil temperature, and a change in the ratio of sensible latent heat removal. Upon demand for cooling, the compressor operates at low speed or on a single stage, but if the humidity rises too high, or upon a call for additional sensible cooling from the thermostat, the controls operate to shift the compressor to the high speed in order to operate at greatest capacity and lowest coil temperature.



The above diagram illustrates a central fan conditioner, using a bank of four direct expansion coils for cooling. The coils are brought on in sequence as the cooling requirements of the space increase. The outdoor damper remains closed to a minimum except when outdoor air can be used for cooling. This system is also used for the control of multi-stage compressors, in which event a circuit is provided which protects the compressor motors in the event of power failure.

ALL-YEAR SYSTEMS

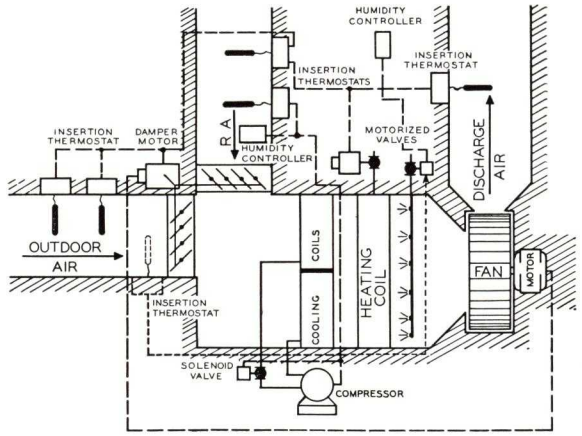
The all-year system combines the functions of both summer air conditioning and winter air conditioning, and in so doing gives rise to specific problems in the control of the system. These problems must be carefully considered when the system is designed.

1. Will the system provide automatic change-over from cooling to heating cycles?

Too frequently the change-over from cooling to heating, or from heating to cooling requires somewhat complicated manual changes and adjustments. In the modern air conditioning system, such methods are not tolerable. During the in-between seasons of the year, spring and fall, the system may be required to operate one day on the heating cycle and the next day on the cooling cycle. Very frequently such changes may be necessary several times during a single day's operation. Where many complicated changes in adjustment must be made manually, dissatisfaction will result.

The Minneapolis-Honeywell Regulator Company has made available standard systems of control which are applicable to the type of air conditioning system which you are designing. All of these standard systems provide changeover from the heating to the cooling cycle as an automatic function requiring no manual attention whatsoever. Thus the owner of the system is assured continuous comfort conditions throughout the year.

Shown below is one example of a Minneapolis-Honeywell standard control system for all-year operation. For an automatic control system designed to take care of your particular air conditioning layout, consult your Minneapolis-Honeywell engineer.



The above diagram illustrates a year-round central fan conditioning system using direct expansion refrigeration for cooling and operating as a warm air system in winter. The system provides for completely automatic changeover between heating and cooling cycles. On either the heating or cooling cycles, the system provides for taking full advantage of all the economies available in the operation of the system, and provides within the limits of the system, independent control of both temperature and humidity, summer and winter.

COMMERCIAL SPACE HEATING

The advantages of CENTRALIZED RESPONSIBILITY for the design, installation and maintenance of commercial space heating control and temperature indication systems cannot be over-emphasized.

It is certain that control as it enters into any part of the building or its mechanical equipment should be the responsibility of a single manufacturer, if confusion is to be avoided and your client's interests protected.

Minneapolis-Honeywell offers to accept the entire responsibility for the controls and instruments to be used in any building that you design.

UNIT VENTILATORS

The unit ventilator which is a self-contained unit provides the functions of heating, cleaning, and ventilating, and presents a very definite control problem. These functions must be coordinated to provide uniform temperatures and necessary ventilation.

Minneapolis-Honeywell can provide either PNEUMATIC or ELECTRIC systems of control for unit ventilators and has had wide experience in the use of both types. The size and type of installation determines which system of control will be preferable for for any particular job. Minneapolis-Honeywell is in a position to exercise unbiased judgment in recommending automatic controls or control systems for unit ventilator installations.

UNIT HEATERS

Unit heaters may be controlled individually or in multiple groups when several are arranged to serve a limited area.

In its simplest form, a unit heater control system will provide a line voltage room type thermostat which will start and stop the unit heater fan motors. Since steam is usually supplied to the units intermittently, special precautions must be taken to prevent the fan motors from operation when the coils are not sufficiently warm to insure against the discharge of cold air. A specially designed limit control should be mounted on the return pipe of the unit heater or strapped on the face of the heater itself to keep the fan motor inoperative until the coil has warmed up to a predetermined minimum temperature.

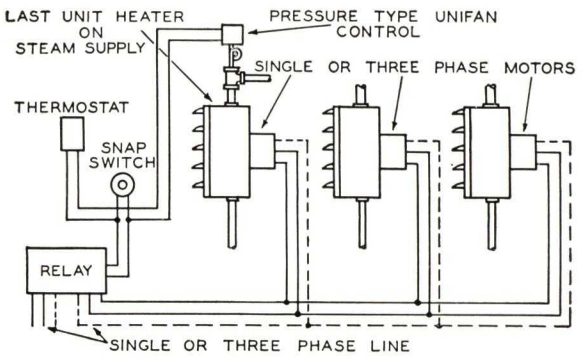
Line voltage controls will provide extremely satisfactory results when control operation, within narrow temperature differentials, is not essential.

A more accurate means of control utilizes the Minneapolis-Honeywell Acratherm operating in conjunction with a "series 10" relay. This system takes advantage of the "Heat Accelerating" feature of the Acratherm and should be used where precise control is desired.

As in the case of the line voltage thermostat application, a low limit controller should be used where the possibility of steam failure exists.

Unit heaters may be grouped to provide zone control. Each zone should be placed under the command of one or more thermostats with the necessary limit controls and relays as dictated by the needs of the individual zone.

The flexibility of Minneapolis-Honeywell controls makes them readily adaptable to all types of unit heater installations.



BATTERY UNIT HEATER CONTROL

ZONE CONTROL

It must be understood that there are definite limitations to the use of a single thermostat for complete building temperature control. Obviously, the thermostat is sensitive to fluctuations in temperature, only at the position of its location. A single thermostat can be effectively applied in the small residence since it is not difficult to select a representative mounting location. In larger residences and in commercial buildings, however, it is usually impossible to find a location for a single thermostat that will give an average measurement of temperatures throughout the building.

Overheating and underheating with their consequent discomfort and fuel waste are the natural results of an attempt to control a large space under these conditions.

Whether the heating system be warm air, hot water, or steam, it should be zoned and the zones placed under the control of separate thermostats.

The problem of zoning should be kept in mind when the heating system is designed. In larger buildings where steam is ordinarily used for heating, the piping layout must be such that the building can be effectively divided from the following standpoint: type of occupancy, hours of occupancy, exposure, and construction. Motorized steam valves may be installed in each zone

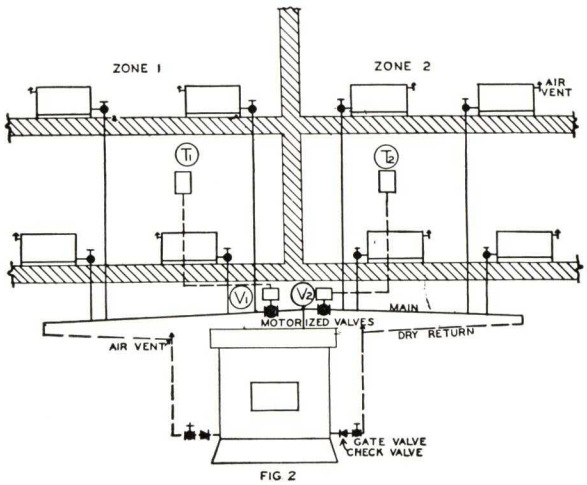


FIG 2

The above diagram illustrates a simple one-pipe up-feed steam system with two zones.

and controlled by individual room thermostats. However, a preferable system of control, where the zones are large, will make use of the Weatherstat to control these motorized steam valves.

Individual radiator control can be used to provide even more uniform temperature. The MODUSTAT, a self-contained radiator valve, has been specifically designed to directly control the admission of steam to each radiator in the system in accordance with room temperatures.

THE WEATHERSTAT

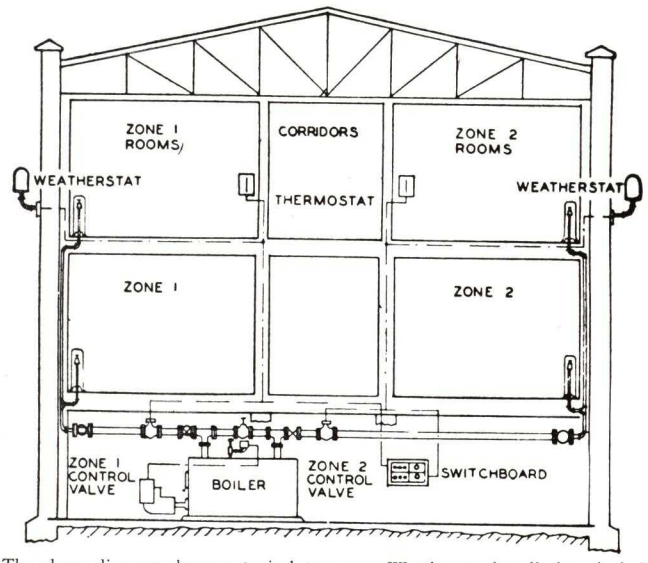
The Weatherstat is the controlling element for a complete system of automatic temperature regulation for large buildings.

The Weatherstat meters the input of heat to a building in accordance with the heat losses from that building. The instrument itself is actually a miniature enclosure or tiny room mounted on the outside of a building so that it may be affected by the same factors of heat loss that affect the building—**outdoor temperature, wind direction, wind velocity,** and **solar radiation.** Heat is supplied to the Weatherstat through an electric heater element and maintains the instrument at the same temperature level as is required within the building.

As outside weather conditions produce varying degrees of heat loss from the building, the Weatherstat, being subjected to the same conditions, calls for more or less electrical heat for itself and at the same time automatically controls the heat input to the building. In this manner the building heat is controlled in accordance with all outside weather fluctuations.

The Weatherstat is the logical control for large or small buildings where, due to construction, occupancy, or interior arrangement, thermostat control is neither practical nor applicable.

The Minneapolis-Honeywell System of Weatherstat Control will automatically maintain the temperature level desired throughout the entire building at all hours and definitely effect a major saving in fuel consumption.



The above diagram shows a typical two zone Weatherstat installation, including a Weatherstat, a night low limit thermostat and a zone valve for each zone, with the terminal switch board shown in the basement. On this particular installation the boiler would be held at a constant pressure or temperature by means of a Pressuretrol controlling a primary burner control.

COMBUSTION CONTROL

The burning of fuels, such as oil or gas, requires that automatic controls be used to: (1) guard against unforeseen hazards; (2) provide an automatic program of starting, and (3) protect against flame failure.

Maximum boiler efficiency with any type of fuel can be obtained only with automatic combustion regulation. Combustion regulation may be compared to the adjustment of the common automobile carburetor. In the latter, however, the improper mixing of fuel and air shows up at once in inefficient operation of the engine and warns the owner instantly; while a boiler does not indicate such lack of efficiency until added fuel costs become apparent.

Protect your clients' interests by specifying:

1. Minneapolis-Honeywell Combustion Controls to guard against hazard.
2. A complete system of Combustion Regulation to insure economy.

BROWN INSTRUMENTS for Indicating, Recording, Controlling

Brown Instruments are manufactured by the Brown Instrument Division of the MINNEAPOLIS-HONEYWELL REGULATOR COMPANY.

1. Indicating and Recording Room Temperature.

A Brown recording resistance thermometer provides a continuous chart record of temperatures throughout the building. The Brown indicating resistance thermometer provides for taking instantaneous readings of temperatures at any required number of points throughout a building. The installation of such equipment gives the engineer a means of keeping a constant check on temperature conditions throughout the building, preventing complaints of occupants and making possible definite economies in operation.

2. Boiler Room Instruments

Brown Instruments for recording and indicating steam flow pressures, stack temperatures, draft pressures and CO_2 content of flue gas, are indispensable to the modern operating engineer.

The gain in efficiency of boiler operation that results from the use of a carefully planned system of instrumentation is generally recognized.

The careful choice of instruments for the boiler room at the time the building is designed will assure the client efficient and economical operation for years to come, and a positive record of these economies will be instantly available.

3. Indicating and Recording Instruments for Air Conditioning.

Modern air conditioning requires modern methods of evaluating the efficiency of operation. Indicating or recording instruments should be used to give a continuous record of room temperatures and humidity, in order to assure comfort conditions and to forestall complaints. Recording and indicating instruments should be used to measure dry bulb and wet bulb temperatures in the outside air, return air and supply air, giving a continuous measure of the operation of the system. Flow meters and flow records can be used to measure water consumption and steam consumption to prevent the occurrence of waste.

BROWN INSTRUMENTS INCLUDE

Thermometers
Pressure Gauges
Vacuum Gauges
Potentiometers
Liquid Level Gauges
Pyrometers
Flow Meters
CO_2 Meters
Micrometers

ENGINEERING SERVICE ON MINNEAPOLIS-HONEYWELL AND NATIONAL CONTROL SYSTEMS AND BROWN INDICATING AND RECORDING INSTRUMENTS IS AVAILABLE AT ALL OFFICES

MINNEAPOLIS-HONEYWELL REGULATOR COMPANY

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RESEARCH DIVISION AND PLANT, WABASH, INDIANA

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SECTION 26

CONTINUED ⟶

THE POWERS REGULATOR CO.

Nearly 45 Years of Automatic Temperature and Humidity Control

2722 Greenview Avenue, CHICAGO, ILL.

CHICAGO, 2722 Greenview Ave.—Buckingham 7100
LOS ANGELES, 1808 W. Eighth St.—Federal 8272
NEW YORK, 231 E. 46th St.—Eldorado 5-2050
TORONTO—106 Lombard St.—Elgin 7673

Offices in 45 Cities—See Your Telephone Directory

For Powers Safety Water Mixing Valves, see File Index

Products

A very complete line of Compressed Air Operated and Self-operating Temperature, Humidity and Air Flow Controls for automatically regulating heating, cooling, ventilating and air conditioning systems and industrial processes.

A complete line of Self-operating and Compressed Air Operated Valves and Regulators made for controlling steam heated hot water heaters and submerged type heaters; and for automatically mixing hot and cold water or steam and cold water, delivering a mixture at a predetermined temperature.

Also Thermometer Regulators for controlling and indicating or recording temperature; Dial Indicating and Recording Thermometers; High Pressure Steam Traps and Pressure Reducing Valves.

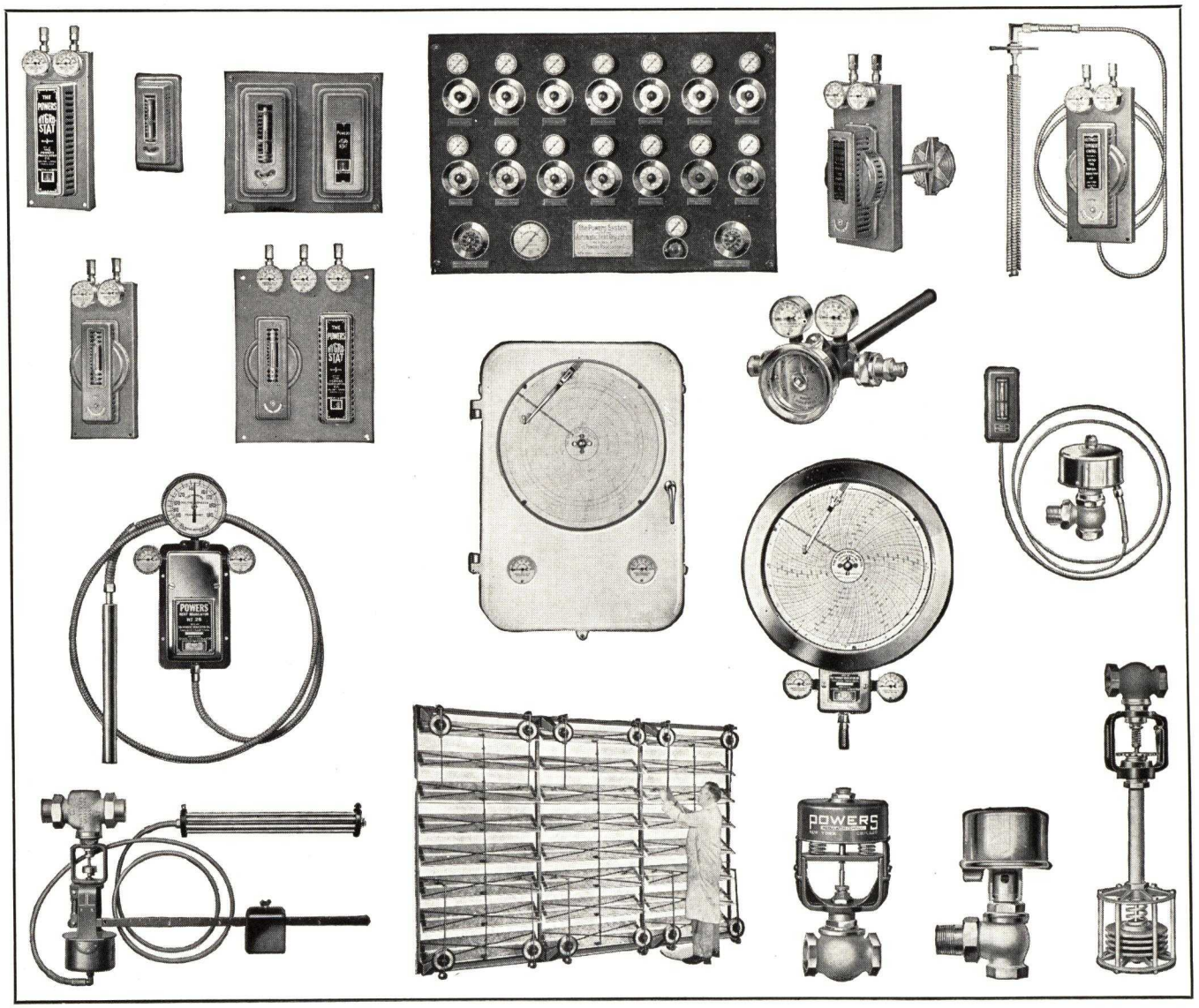
Engineering Service

As the accurate performance of a heating, cooling, ventilating or air conditioning system is dependent upon its automatic control equipment, and as the cost of such control is but a fraction of the entire system, the use of the proper type of regulation is always sound economy.

Nearly 50 years of experience in furnishing and installing temperature and humidity control for every conceivable purpose in all types of buildings has given us a wealth of knowledge from which you can draw in selecting the proper type of control for any purpose.

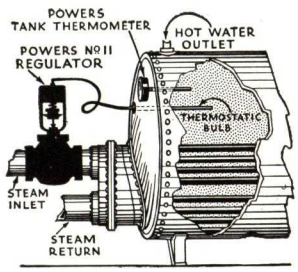
Catalogs and Bulletins

Describing any or all of our products furnished upon request. Telephone or write our nearest office. See your telephone directory.

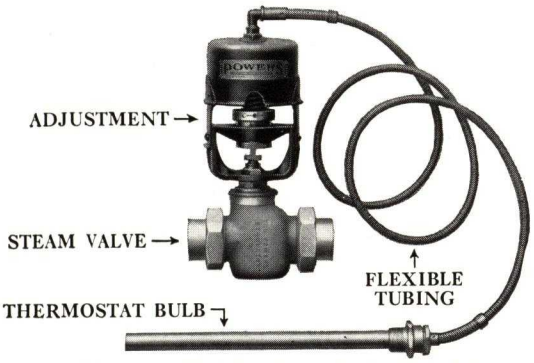


POWERS TEMPERATURE REGULATORS FOR STEAM HEATED HOT WATER HEATERS

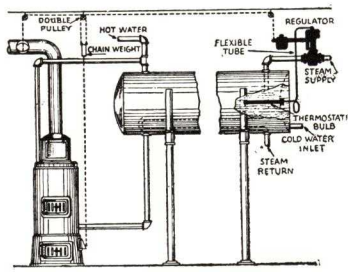
SELF-OPERATING REGULATORS



Powers Self-Operating No. 11 Regulator



No. 11 Self-Operating Tank Regulator—Spring Type Adjustment



Powers No. 12 Regulator

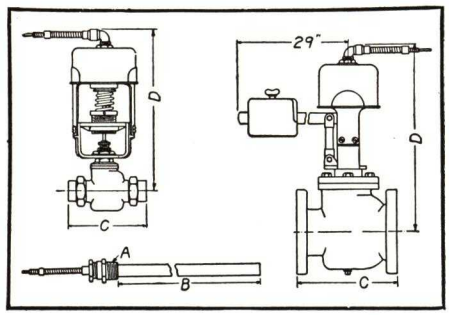
Used on steam heated hot water service in hotels, apartment buildings, offices, schools, shops, hospitals, factories, laundries, etc. Because this regulator prevents overheated water, it saves fuel and prolongs the life of faucets, valves and packing. Self-operating; easily installed.

In ordering, always give size of tank, steam pipe size, steam pressure, standard or stainless steel trimmed valves, operating temperature, range of adjustment, type of adjustment, length of flexible tubing, and whether bulb will be installed horizontally, vertically pointing upward or vertically pointing downward.

The spring type adjustment regulator is commonly used for this work, except in sizes larger than 4 in., when the lever type is used. Smaller sizes will be furnished in lever type if preferred.

The regulator will be furnished to operate at 160° F., with adjustability 20° above and below that point, unless otherwise specified.

The flexible connection tube is 6 ft. long for sizes 1½ in. and smaller; 8 ft. for 2 to 4 in., inclusive; and 10 ft. for larger sizes. Additional lengths of tubing will be furnished at 30 cents per foot net.



Valves ¼ and ⅜ in. are of the single seat type, all other sizes are of the double seated or balanced type. Companion flanges can be furnished at market prices. Flanged valves will be drilled standard unless otherwise ordered.

Specify standard valve for steam pressures up to 100 lb. and monel fitted valve for steam pressures above 100 lb.

Specification—In connection with the (steam heated) hot water storage tank, furnish and install Powers No. 11 Tank Regulator with .... inch [standard] [monel fitted] valve with .... feet of flexible tubing. Regulator shall maintain the temperature of the water at .... degrees with steam pressure at .... lb.

Powers Nos. 12 and 13 Regulators

Where installation is to control steam coil and auxiliary coal burning heater, specify Powers No. 12 Regulator with chains, pulleys, etc., for the control of dampers on auxiliary heaters.

For coal burning heaters without steam coils, use Powers No. 13 Regulator.

PRINCIPAL DIMENSIONS OF NO. 11 TANK REGULATOR

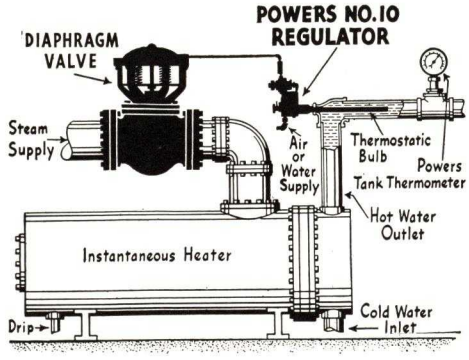
Valve size....in.	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8
Style of body	Union	Union	Union	Union	Union	Union	Union	Screwed	Screwed	Screwed	Flanged	Flanged	Flanged	Flanged	Flanged
Material of body	Bronze	Bronze	Bronze	Bronze	Bronze	Bronze	Bronze	Iron	Iron	Iron	Iron	Iron	Iron	Iron	Iron
Dimension A....in.	1	1	1	1	1	1	1	1	1	1	1	1	1¼	1¼	1¼
B....in.	8	8	10	10	12	14	14	16	16	18	20	20	24	24	30
C....in.	4⅛	4⅛	5⅝	6	6 11/16	6 7/8	7 7/8	8	9¼	9¼	10¾	10¾	12	13	16¾
D....in.	10 7/8	10 7/16	11 9/16	11 7/16	11 7/8	12 3/16	12½	15¼	15⅝	15⅝	15⅞	15⅞	21½	23	24

COMPRESSED AIR AND WATER OPERATED REGULATORS

Powers No. 10 Compressed Air or Water Operated Regulator

All-Metal Diaphragm Valve

Rubber Diaphragm Valve



A compressed air or water operated regulator for the control of hot water heaters where accurate control of a large valve is required. Regulator can be supplied with either all metal or rubber diaphragm valves up to 10 in. in size.

Specification—In connection with the (steam heated) hot water storage tank, furnish and install Powers No. 10 Tank Regulator with .... in. [standard] [monel fitted] [metal diaphragm] [rubber diaphragm] valve. Regulator shall maintain the temperature of the water at .... degrees with steam pressure at .... lb.

MEMORANDA

thrush

HOT WATER HEATING SYSTEM FLOW CONTROL

FLOW CONTROL SYSTEM

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THE complete Thrush Flow Control System consists of a Thrush Water Circulator, a Thrush Flow Control Valve, a No. 201 Thrush Radiant Heat Control (thermostat), a No. 203 Thrush Modulating Boiler Control, a No. 198 Thrush Relay Transformer, a No. 12 Thrush Pressure Reducing Valve, a No. 4 Thrush Differential Pressure Relief Valve and a special air-tight Thrush Pressure Tank.

The system is a closed pressure system with automatic filling of the boiler, automatic relief of excess pressures, adequate provision for expansion when the water is heating and complete mechanical control of circulation.

When this system is used the heating plant becomes completely automatic, flexible and quick to respond to the slightest need for heat.

Thrush Flow Control System makes warm water heating "quick heating"—quicker than steam. A reservoir of warm water is kept available for instant distribution throughout the heating system. When heat is needed, forced circulation drives the warm water into every radiator in every room quickly. When room temperature is restored this circulation stops. Therefore there is no overheating and no waste of fuel. This warmer water in the boiler makes the auxiliary water heater efficient and provides a really hot domestic water supply in winter or summer at trifling cost.

Thrush Flow Control System is entirely automatic for summer-winter use. Nothing at all need be done to the job for summer operation. The patented Thrush Flow Control Valve shuts off all circulation through the building when heat is not needed but if heat is needed on an occasional chilly morning, Thrush System will provide it without a thought on the part of the tenant.

No matter what type of automatic firing device is used with a warm water job, Thrush Flow Control System will increase its efficiency and economy and give it a chance to really demonstrate its advantages.

Thrush Flow Control maintains absolutely uniform temperatures by Thrush Radiant Heat Control anticipating outside weather changes which was never before possible with any kind of heat. It reduces the running time of the firing device, saves 15 to 30 per cent of the yearly fuel bill and supplies hot domestic water service at nominal cost.

Thrush Flow Control can be installed quickly and economically on old or new heating plants.

A THRUSH SYSTEM FOR EVERY NEED

CLASS AA SYSTEM consists of special Thrush Pressure Tank; No. 4—¾″ Thrush Differential Pressure Relief Valve; No. 12—¾″ Thrush Pressure Reducing Valve with Built-in Strainer; Combination Gauge and Thermometer; No. 5 Thrush Automatic Damper Regulator.

CLASS A SYSTEM consists of special Thrush Pressure Tank; No. 4—¾″ Thrush Differential Pressure Relief Valve; Combination Gauge and Thermometer; No. 5 Thrush Automatic Damper Regulator.

CLASS BB SYSTEM consists of special Thrush Pressure Tank; No. 4—¾″ Thrush Differential Pressure Relief Valve; No. 12—¾″ Thrush Pressure Reducing Valve with Built-in Strainer; Combination Gauge and Thermometer;

CLASS B SYSTEM consists of special Thrush Pressure Tank; No. 4—¾″ Thrush Differential Pressure Relief Valve; Combination Gauge and Thermometer.

CLASS DD SYSTEM consists of special Thrush Pressure Tank; No. 4—¾″ Thrush Differential Pressure Relief Valve; No. 12—¾″ Thrush Pressure Reducing Valve with Built-in Strainer.

CLASS D SYSTEM consists of special Thrush Pressure Tank; No. 4—¾″ Thrush Differential Pressure Relief Valve.

FEATURES OF THE THRUSH SYSTEM

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- ***Complete***—Thrush Flow Control System of Automatic Warm Water Heating is a complete, balanced, forced circulating pressure system with completely automatic flow control scientifically engineered—developed through years of practical experience and continuous use.

- ***Forced***—Forced circulation puts warm water into every radiator—in every room, quickly. Circulation is stopped when room temperatures are recovered so that there is no overheating.

- ***Automatic***—The operation of this system is fully automatic. It maintains uniform temperatures without thought of the home owner from the beginning of the year to the end.

- ***Summer-Winter***—Thrush Flow Control is ideal for summer-winter hook-up because nothing whatever need be done to the system at any time. It will automatically provide heat in the home when heat is needed but in summer when heat is not desired in the radiators, none reaches them. Yet the automatic firing device continues to supply domestic hot water without interruption.

- ***Economical***—Thrush Flow Control saves fuel by reducing the running time of the firing device and eliminating the fuel and the cost of equipment otherwise required for domestic hot water.

- ***Easy Installation***—Thrush Flow Control System is very easy and inexpensive to install. Refer to the diagrams—count the number, kind and cost of fittings—and you will be surprised at the extreme simplicity of Thrush.

- ***Reduced Pipe Sizes***—Thrush Flow Control System permits the use of greatly reduced pipe sizes and requires smaller valves and fittings.

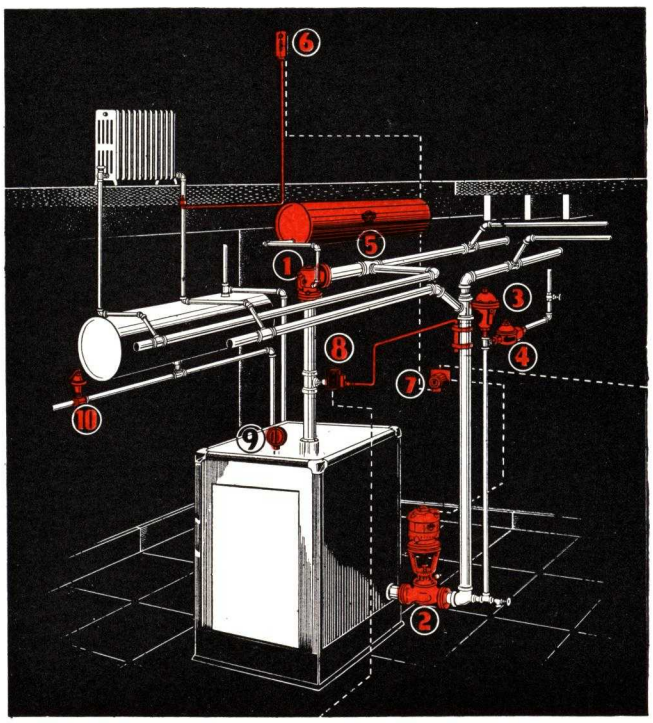
- ***Less Labor***—The labor cost of installing a Thrush System is surprisingly low. There are no large pipes to cut and thread.

- ***Zone Control***—Thrush Flow Control System is ideal where zone control is required. It is simply a matter of installing two or more Flow Control Valves, Circulators and Radiant Heat Controls.

- ***Responsibility***—The Thrush company takes full responsibility for the satisfactory operation of a Thrush Flow Control System installed according to instructions—and its reputation and integrity makes that acceptance of responsibility valid.

A COMPLETE COORDINATED WARM WATER HEATING SYSTEM

1. *Thrush Flow Control Valve* (patented). Provides complete control of circulation.
2. *Thrush Water Circulator.* Assures positive, uniform forced circulation.
3. *No. 4 Thrush Differential Pressure Relief Valve.* Prevents excessive pressure in system.
4. *No. 12 Pressure Reducing Valve.* Reduces supply line pressure and provides automatic filling of the system.
5. *Thrush Pressure Tank.* Vents system of air and gases. Adds to safety.
6. *No. 201 Radiant Heat Control.* Provides a constant supply of radiant heat and fractional degree control of room temperature.
7. *No. 198 Relay Transformer.* Used with No. 201 Radiant Heat Control to furnish line voltage to Circulator motor.
8. *No. 203 Modulating Boiler Water Temperature Control.* Operates firing device to vary boiler water temperature according to heating demand.
9. *Special Combination Gauge and Thermometer.* Gives accurate reading of pressure and temperature.
10. *No. 75 High Pressure Relief Valve.* Protects storage tank and plumbing fixtures from excessive pressure.



ENGINEERING AND

FIGURING RADIATION

The following BTU method for figuring radiation is simple enough to be of practical value. Through the use of this method you will be assured that ample radiation is being provided. The tables give basic factors which can be used to accurately determine the amount of radiation or heat required to maintain any desired room temperature under practically all conditions. These tables are followed by an example which gives explanation for their use.

Tables of BASIC HEAT LOSS CO-EFFICIENTS

Masonry Walls

Masonry Thickness (inches)	Type of Wall	Interior Finish: Plain — No Finish	Plastered — ½ in. Thick	Plastered — On Lath—furred	Plastered — On ½ in. rigid insul.—furred	Plastered — On 1 in. rigid insul.—furred
8	Solid Brick	.50	.46	.32	.22	.16
12		.36	.34	.25	.19	.14
16		.28	.27	.21	.16	.13
8	Hollow Tile Stucco	.40	.37	.27	.20	.15
10		.39	.37	.27	.19	.15
12		.30	.29	.22	.17	.13
8	Limestone or Sandstone	.71	.64	.39	.25	.18
12		.58	.53	.34	.23	.17
16		.49	.45	.31	.22	.16
10	Concrete	.62	.57	.37	.24	.18
16		.48	.44	.31	.21	.16
20		.41	.39	.28	.20	.15
8	Cinder Block	.42	.39	.28	.20	.16
12		.37	.35	.26	.19	.15
8	Concrete Block	.56	.52	.34	.23	.17
12		.49	.46	.32	.22	.16

Masonry Walls With Veneer

Type of Wall: Facing	Backing inches		Interior Finish: Plain — No Finish	Plaster — ½ in. Thick	Plaster — On Lath—furred	Plaster — On ½ in. rigid insul.—furred	Plaster — On 1 in. rigid insul.—furred
4 in. Brick or Cut-Stone Veneer	Hollow Tile	6	.37	.35	.26	.19	.16
		8	.36	.34	.25	.19	.14
		10	.35	.33	.25	.18	.14
		12	.28	.26	.21	.16	.13
	Concrete	6	.61	.56	.36	.24	.17
		10	.51	.47	.32	.22	.16
		16	.41	.38	.28	.20	.15
	Cinder Block	8	.35	.33	.25	.18	.14
		12	.31	.30	.23	.17	.14
	Concrete Block	8	.44	.42	.30	.21	.16
		12	.40	.38	.28	.20	.15

Plastered Frame Walls with Various Exteriors

Type of Wall: Exterior Finish	Sheathing Inches		Interior Finish: Studs and Lath	Studs and ½ in. rigid insul.	Studs and 1 in. rigid insul.	Studs and Lath with insul. fill
Wood Siding or Shingles	Wood	1	.30	.22	.17	.12
	Plaster Bd.	½	.35	.25	.19	.13
Stucco	Wood	1	.35	.25	.18	.13
	Plaster Bd.	½	.47	.29	.21	.14
Brick Veneer	Wood	1	.32	.23	.17	.12
	Plaster Bd.	½	.42	.27	.20	.13

Partitions

Construction	Plain	Finished one side	Finished both sides
Studs, lath and plaster	.....	.62	.34
4 in. Clay Tile	.45	.42	.40
4 in. Gypsum Tile	.30	.28	.27
4 in. Clay Brick	.50	.46	.43

Concrete Floors and Ceilings

Type of Ceiling	Inches Thick	Type of Finish Flooring: Bare	Wood on Sleepers — Single	Wood on Sleepers — Double	Tile or Terrazzo
No Ceiling	4	.65	.40	.31	.61
	6	.59	.37	.30	.56
	8	.53	.35	.28	.51
Plaster direct to Concrete	4	.59	.38	.30	.56
	6	.54	.35	.28	.52
	8	.50	.33	.27	.47
Suspended Lath (or Plaster Bd.) & Plaster	4	.37	.28	.23	.36
	6	.35	.26	.22	.34
	8	.33	.25	.21	.32
Suspended ½ in. Rigid Insulation & Plaster	4	.24	.20	.17	.24
	6	.23	.19	.17	.23
	8	.22	.18	.16	.22
1½ in. Corkboard & Plaster	4	.15	.13	.12	.14
	6	.14	.13	.12	.14
	8	.14	.12	.11	.14
No Ceiling Floor on Ground	4	1.07	.35	.28	.98
	6	.90	.33	.27	.84
	8	.79	.32	.26	.74

Frame Floors and Ceilings

Type of Ceiling	Type of Flooring: None	Pine	Pine on ½ in. Rigid Insul.	Maple or Oak on Pine
No Ceiling	.....	.55	.32	.40
Lath and Plaster or Plaster Bd.	.73	.33	.24	.28
Lath, Plaster and 4 in. Rock Wool	.11	.10	.....	.09
1½ in. Corkboard and Plaster	.19	.14	.....	.13

Flat Roofs

Type of Roof Deck — To be covered with built-up roofing	No Ceiling: No Insul.	Rigid Type Insulation: ½ in. Fibre	1 in. Fibre	1 in. Cork	1½ in. Cork	2 in. Cork	Lath (or Plaster Board) and Plaster Ceiling: No Insul.	Rigid Type Insulation: ½ in. Fibre	1 in. Fibre	1 in. Cork	1½ in. Cork	2 in. Cork
Concrete 2 in.	.82	.37	.24	.22	.16	.13	.42	.26	.19	.18	.14	.11
Concrete 4 in.	.72	.34	.23	.21	.16	.12	.40	.25	.18	.17	.13	.11
Concrete 6 in.	.64	.33	.22	.21	.15	.12	.37	.24	.18	.17	.13	.11
Wood 1 in.	.49	.28	.20	.19	.14	.12	.32	.21	.16	.15	.12	.10
Wood 1½ in.	.37	.24	.18	.17	.13	.11	.26	.19	.15	.14	.11	.10
Wood 2 in.	.32	.22	.16	.16	.12	.10	.24	.17	.14	.13	.11	.09
Flat Metal	.95	.39	.25	.23	.17	.13	.46	.27	.19	.18	.14	.11
Bare Cor. Iron	1.50	.....	.....	.....	.....	.....	1.10	.....	.....	.....	.....	.....

Plastered Ceilings with Unheated Attic and Shingles (or Composition Roofing) on Wood Sheathing Above

Insulation Between Ceiling Joists	No Attic Flooring: On Lath (or Plaster Board)	On ½ in. Rigid Insul.	On 1 in. Rigid Insul.	On 1½ in. Corkboard	On 2 in. Corkboard	1 in. Pine Attic Flooring: On Lath (or Plaster Board)	On ½ in. Rigid Insul.	On 1 in. Rigid Insul.	On 1½ in. Corkboard	On 2 in. Corkboard
None	.30	.22	.16	.12	.10	.21	.16	.12	.10	.09
½ in. Flexible	.16	.13	.11	.10	.08	.13	.11	.10	.08	.07
2 in. Fill	.15	.....	.....	.....	.....	.12	.....	.....	.....	.....
4 in. Fill	.11	.....	.....	.....	.....	.09	.....	.....	.....	.....

Windows, Skylights and Doors: Single Windows or Skylights	Double Windows or Skylights	Doors	Air Changes in Room: Changes per hour	½	1	1½	2	3	4
1.35	.60	.69		.009	.018	.027	.036	.054	.072

AIR CHANGES TO BE USED UNDER NORMAL CONDITIONS

Type of Room or Building	Air Changes per Hour
Rooms having walls protected from outdoor air (basement rooms, etc.)	½
Rooms having 1 side exposed	1
Rooms having 2 sides exposed	1½
Rooms having 3 or 4 sides exposed, bathrooms, public rooms (stores, churches, etc.) and residence entrance halls	2
Entrance halls or lobbies to public buildings	3 or 4

Add ½ air change to rooms on side or corner of prevailing wind and also those with fireplace.

INSTALLATION DATA

OUTDOOR DESIGN TEMPERATURE

In selecting an outdoor temperature to arrive at the required temperature difference it is not necessary to use the lowest outdoor temperature nor should the average winter temperature be used. A temperature of at least 40° below the average winter temperature in or near your locality, taken from the Weather Bureau Records, is recommended.

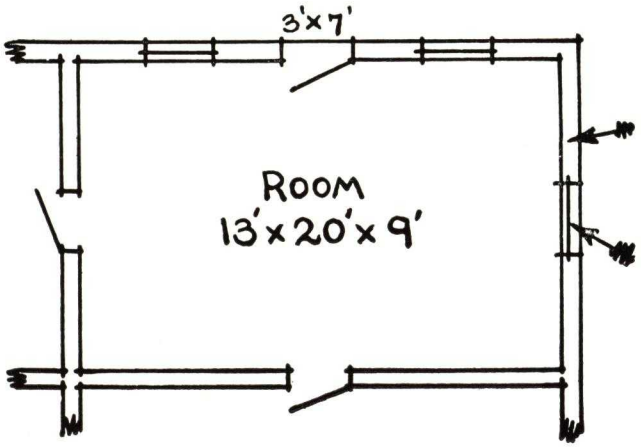
RADIATOR HEAT EMISSIONS

Average Water Temp. in Radiators	Approximate Emission per Hour per Sq. Ft. of Direct Radiation
180° F.	170 B.t.u. (recommended for regular Thrush gravity systems).
190° F.	180 B.t.u.
200° F.	200 B.t.u. (recommended maximum for Thrush Flow Control Systems).

EXAMPLE

Maple floor on pine sub-flooring with Basement under, no Basement ceiling.

Ceiling has attic space above with pitched roof and 1-inch pine floor.



Frame wall—wood siding, 1-inch wood sheathing, studs, lath and plaster.

Single glass windows, double hung. 3 ft. x 5 ft. frames.

FIRST

Determine B.t.u. or heat loss through all exposed or cold surfaces.

EXPOSED WALL: There is a net surface of 231 sq. ft. and the basic heat loss factor for this construction will be found in the table to be .30 B.t.u. The room temperature to be maintained in this example is 70° F. and the outdoor temperature zero, giving a temperature difference of 70°. Therefore 70° × .30 B.t.u. per sq. ft. = 21 B.t.u.: 21 B.t.u. × 231 sq. ft. = 4851 B.t.u. loss per hour through exposed wall.

In like manner the loss through WINDOWS, CEILING AND OUTSIDE DOOR can be found. These losses will be found to be 4252 B.t.u., 3822 B.t.u. and 1014 B.t.u., respectively.

FLOOR LOSS: The basement under this floor is closed to the outside air and is partially heated by the mains so therefore assume its temperature to be 50° in zero weather, making a temperature difference of 20° between the two sides of floor. The basic heat loss factor for each degree of difference is .40 B.t.u. Therefore 20° × .40 B.t.u. = 8 B.t.u.: 8 B.t.u. × 260 sq. ft. = 2080 B.t.u. required for floor.

SECOND

Determine B.t.u. required to heat air entering room by infiltration which results from chimney drafts, opening of doors, leakage through cracks, etc.

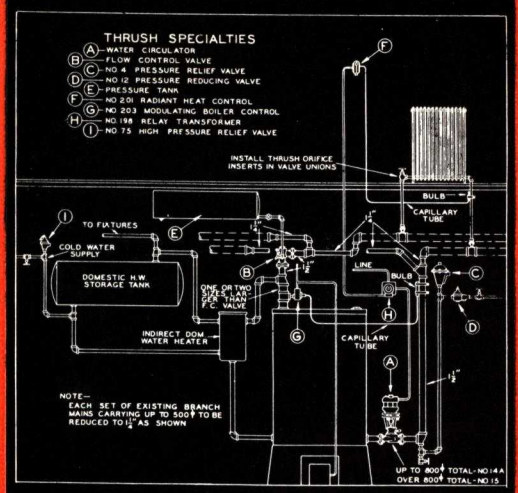
Cubical contents are 2340 cu. ft. and since the air in this room will change approximately 1½ times each hour select the basic factor from the table which is .027 B.t.u. 70° × .027 B.t.u. = 1.89 B.t.u: 1.89 B.t.u. × 2340 cu. ft. = 4423 B.t.u required for air entering room by infiltration.

THIRD

Determine the direct cast iron or equivalent radiation requirement for this room.

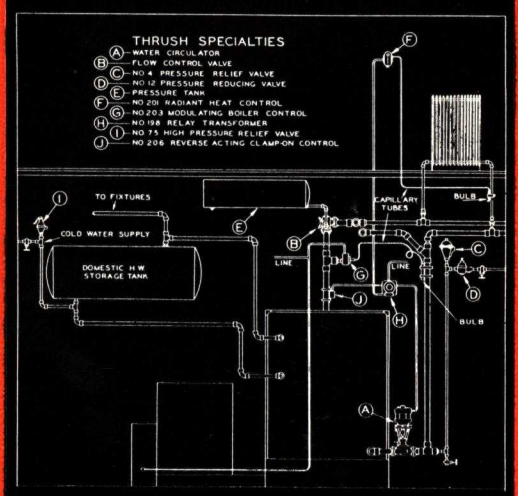
Take the total B.t.u. requirement found in the first and second steps of this example, which is 20,442 B.t.u. and divide same by any desired heat emission for each sq. ft. of radiating surface which will be found above this example. For regular Thrush Systems in which gravity or natural circulation is to be used, we would recommend a heat emission of 170 B.t.u. per sq. ft. 20,442 ÷ 170 = 120 sq. ft. of radiation, or its equivalent required to heat this room. We would recommend a maximum heat emission of 200 B.t.u. for Thrush Flow Control Systems which would make this room require 102 sq. ft.

TYPICAL INSTALLATIONS



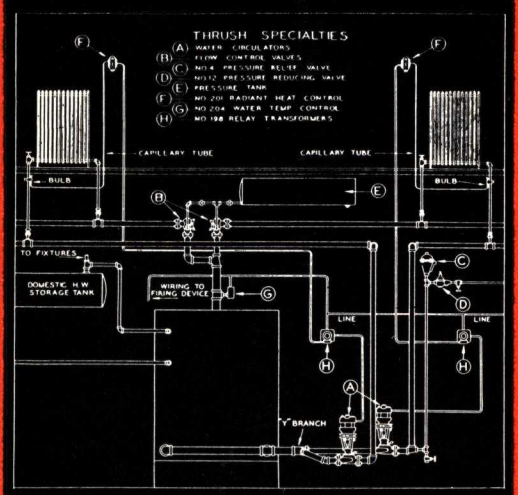
CONVERSION INSTALLATION HAVING TWO FLOW AND RETURN MAINS

Average installation showing conventional method of main reduction in accordance with pipe size tables given on page 10. This can usually be accomplished with nipples and fittings, and minimum of pipe work and labor. In addition to main reductions, Thrush Orifice Inserts should be installed in radiator valves over ½" in size, to balance flow through large branch connections.



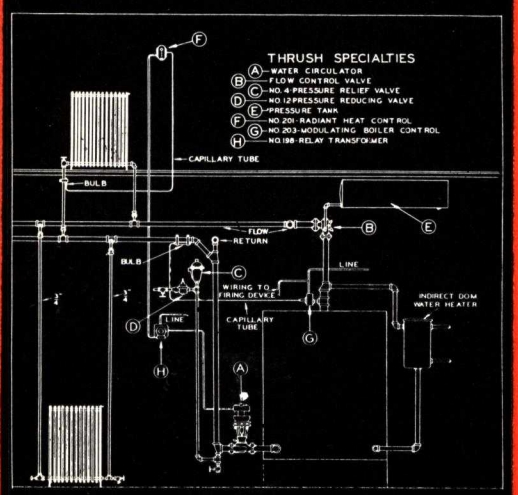
STOKER FIRED INSTALLATION

Shows proper installation of Thrush Flow Control System with soft coal stoker fired boiler. Stoker is controlled by No. 203 Thrush Modulating Boiler Control G. The No. 206 Control J is wired to Thrush Circulator and will start Circulator if boiler temperature should over-ride to 220 degrees. Will operate Circulator just long enough to reduce boiler temperature. If stoker does not have some form of draft control to reduce natural draft, then it is advisable to place a swing check damper in draft chamber ahead of blower. This will prevent high boiler temperatures between stoker operations. The No. 201 Thrush Radiant Heat Control F operates Thrush Circulator only to maintain constant room temperature.



ZONE CONTROL INSTALLATION

Shows proper application of Thrush Flow Control equipment for two zone installation. A Thrush Flow Control Valve and Circulator, with separate No. 201 Thrush Radiant Heat Control, makes each zone a separate heating plant. Insures perfect temperature control to meet individual demand of each unit. Any desired temperature can be maintained in each zone, making it unnecessary to overheat one portion of a building in order to properly heat another part. Any number of zones can be heated from one boiler, eliminating the additional boilers that would be required to furnish individual heating for two or more tenants. Particularly recommended for apartments, row houses, or store buildings having several tenants.



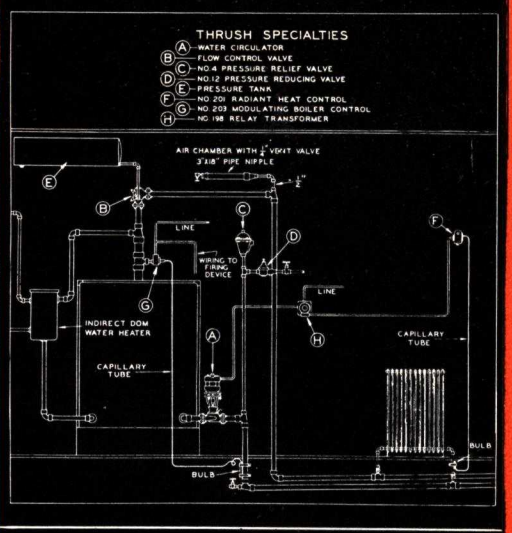
TYPICAL INSTALLATION WITH CONNECTIONS FOR BASEMENT RADIATOR

Shows method of circulating basement radiation with flow and return branches dropping down from mains on basement ceiling. Saves running separate return around wall at floor level. In buildings having no basement all of the radiators can be on the same level of the boiler and the flow and return mains carried above the radiators as shown. Domestic water connections are also shown.

TYPICAL INSTALLATIONS

TYPICAL INSTALLATION FOR BUILDINGS WITHOUT BASEMENT

In localities where conditions prohibit excavating for basements, this detail shows how Thrush Flow Control System can be adapted. The boiler can be on the first floor level, or slightly lower, and both the flow and return mains carried under the first floor. Sizing of mains and branches is the same as used for conventional up-feed system.

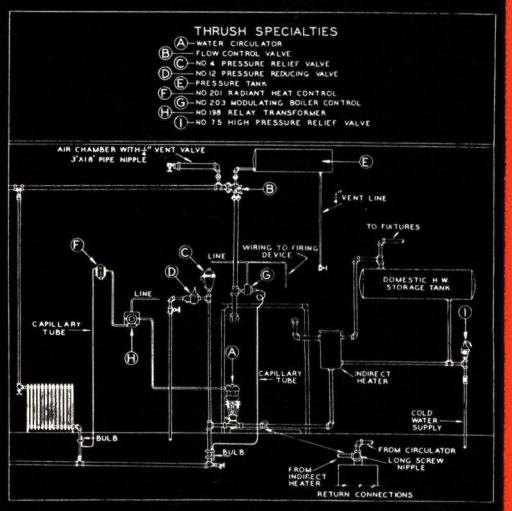


ARCOLA TYPE INSTALLATION—OVERHEAD FEED

Shows correct installation of complete Thrush Flow Control System for Arcola type systems where flow main is carried overhead and return under floor.

Provides summer-winter domestic water supply and all the advantages of larger Flow Control installations.

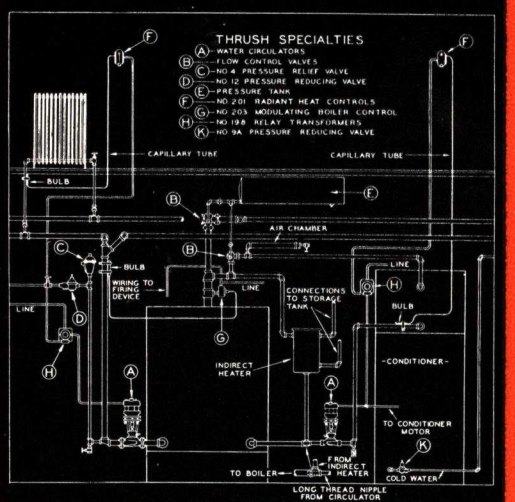
Thrush Pressure Tank provides for expansion of boiler water. Air chamber is required to vent the flow main.



THRUSH FLOW CONTROL SYSTEM WITH SUMMER-WINTER CONDITIONER

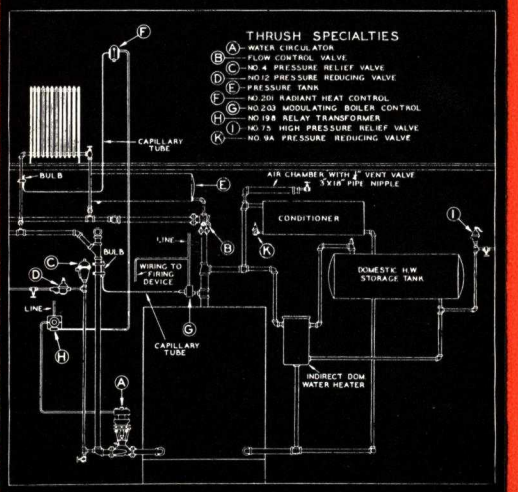
(SPLIT SYSTEM)

Where it is desired to heat as well as condition some rooms with the conditioner, this detail shows proper application of Thrush Flow Control System. It is not desirable to recirculate air from certain rooms (such as garages, servants' quarters, kitchens and baths). This installation provides zone control of the radiator system with the conditioner on a separate zone. Year around domestic water supply is an important feature of this system as shown. Thrush engineers recommend warm water heating for the entire building with air conditioning for part of the building, if desired.



THRUSH FLOW CONTROL SYSTEM WITH WINTER CONDITIONER

This detail shows the complete Thrush Flow Control System in conjunction with a winter conditioner for cleaning and humidifying the air in living and sleeping rooms. The entire heating system is by warm water radiators sensitively controlled by the No. 201 Thrush Radiant Heat Control. Year around domestic water supply is also an additional advantage for this type of heating and conditioning system.



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44

For THRUSH FLOW CONTROL SYSTEM

Radiator Valve and Riser Sizes to All Floors

	Steel Pipe
0—100 sq. ft. radiation	½″
over 100 sq. ft. radiation	¾″
	Copper Pipe
0— 60 sq. ft. radiation	*⅜″
60—125 sq. ft. radiation	½″
over 125 sq. ft. radiation	¾″

*Where ⅜″ lateral branches are over average length, increase to ½″ between mains and vertical risers.

Risers to Two or More Radiators to Upper Floors

	Steel Pipe	Copper Pipe
0— 75 sq. ft. total radiation	½″	½″
75—110 sq. ft. total radiation	¾″	½″
over 110 sq. ft. total radiation	¾″	¾″

Main Sizes

STEEL PIPE

Sq. Ft. of Radiation	Size and Number of Mains
0- 300	one 1″
301- 500	one 1¼″ or two 1″
501-1000	one 1½″ or two 1¼″
1001-1500	one 2″ or two 1½″
1501-2500	one 2½″ or two 2″
2501-5000	one 3″ or two 2½″

2½″ and 3″ mains may be reduced to 2″ at proper radiation intervals.

COPPER PIPE

Sq. Ft. of Radiation	Size and Number of Mains
0- 300	one ¾″, over 50′ long, 1″
301- 500	one 1″ or two ¾″
501- 800	one 1¼″ or two 1″
801-1250	one 1½″ or two 1¼″
1251-2000	one 2″ or two 1½″
2001-3500	one 2½″ or two 2″
3501-7000	one 3″ or two 2½″

2″, 2½″, and 3″ mains may be reduced at proper radiation intervals to 1½″.

Mains of unusual length or those meeting a special condition should receive special consideration.

B. T. U. Heat Emission Factors

Per Square Foot per Hour for Various Average Water Radiator Temperatures

170 B.T.U.	for 180° F. average
180 B.T.U.	for 190° F. average
200 B.T.U.	for 200° F. average

It is reconciled as satisfactory in consideration of practical operation a maximum B.T.U. emission factor of 200 for calculations in Thrush Flow Control Systems.

For Thrush Flow Control System Conversion Jobs

Reduce flow and return mains at the boiler to same sizes as shown in tables, using reducing elbows or couplings and connect reduced return mains with Y fittings. Old jobs having ¾″, 1″, 1¼″ or 1½″ radiator valves should be reduced to proper sizes with Thrush Orifice Inserts.

Carry all flow or return mains full size to terminating radiators or to end of main. Mains should terminate in first floor radiators where possible. Mains should pitch up from boiler to terminating radiator in the average up-feed installation.

Net boiler sizes should be determined from the total B.T.U. requirement, divided by 150, which is conventional method of boiler ratings. Boiler should be chosen on this basis of rating for standing radiation equivalent.

Flow Control Valve Sizes

	Steel Pipe Sq. Ft. Rad.	Copper Pipe Sq. Ft. Rad.
No. 114—1″	Up to 300	Up to 500
No. 114A—1¼″	Up to 500	Up to 750
No. 115—1½″	Up to 1,000	Up to 1,250
No. 120—2″	Up to 1,500	Up to 2,000
No. 125—2½″	Up to 2,500	Up to 3,500
No. 130—3″	Up to 5,000	Up to 7,000

Circulator Sizes for Flow Control System

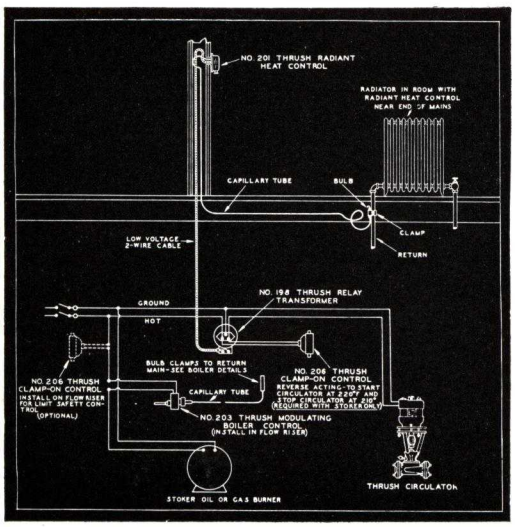
No. 14—1″	Up to 500 sq. ft. radiation
No. 14A—1¼″	Up to 800 sq. ft. radiation
No. 15—1½″	Up to 1,500 sq. ft. radiation
No. 22—2″	Up to 2,500 sq. ft. radiation
No. 23—3″	Up to 5,000 sq. ft. radiation

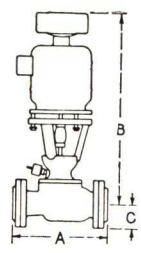
*Tank Sizes for Flow Control System

No. 0.	Up to 500 sq. ft. radiation.
No. 1.	Up to 1000 sq. ft. radiation.
No. 2.	Up to 2000 sq. ft. radiation.
No. 3.	Up to 3000 sq. ft. radiation.

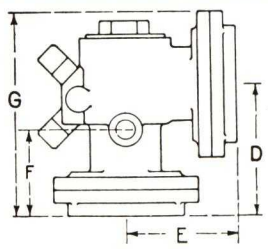
*Above sizes for 1 or 2 story buildings. Use one size larger tank for 3 or 4 story buildings.

WIRING DIAGRAM AND ROUGHING-IN DIMENSIONS





Circulator No.	Size, in.	A In.	B In.	C In.
14	1	8¾	16¾	1⅛
14A	1¼	10⅛	16¾	2 5/16
15	1½	10⅛	17	2 9/16
22	2	10⅛	20¾	2 9/16
23	3	11⅜	21	3⅜



Flow Control Valve No.	Size, in.	D In.	E In.	F In.	G Overall, in.
114	1	2 1/16	2	1	4 1/16
114A	1¼	4⅛	3¾	2¾	6⅜
115	1½	4⅝	4⅛	3⅛	6⅞
120	2	4¾	4 1/16	3	7⅜
125	2½	5¼	4⅜	3¼	8¼
130	3	6½	5⅞	3⅜	9¾

HOT WATER SPECIALTIES

THRUSH LOW PRESSURE

Relief Valves

Thrush Relief Valves for hot water heating plants are made in a range of types, sizes, and prices, to meet varying conditions. All have all-brass working parts and can be supplied from the factory set for any relief pressure up to 35 lbs. The standard pressure relief setting is 28 lbs.

No.	Size	Made of	Weight
4	¾"	Iron	12 lbs.
30	½"	Iron	4 lbs.
35	½"	Brass	3 lbs.
40	½"	Iron	3 lbs.

Reducing Valves

Pressure regulating valves to maintain predetermined pressure automatically. All working parts are brass. Bronze metal diaphragm operated. Standard factory pressure setting for delivery pressure of 12 lbs., with an initial pressure of 45 lbs. Specify when ordering if different pressure setting desired.

No.	Size	Made of	Weight
9	¼"	Brass	2 lbs.
9A	⅜"	Brass	2 lbs.
10	½"	Brass	4 lbs.
11	½"	Brass	5 lbs.
12	¾"	Iron	7 lbs.

THRUSH HIGH PRESSURE

Relief Valves

All are metal diaphragm operated Relief Valves with all-brass working parts, soundly designed to protect safely hot water supply boilers, range boilers, and gas storage heaters. Can be supplied from factory set at any pressure up to 150 lbs. Standard setting 85 lbs. Specify when ordering if other than 85 lbs. pressure setting required.

No.	Size	Made of	Weight
45	½"	Iron	3 lbs.
75	½"	Iron	3 lbs.
77	½"	Brass	3 lbs.
55	¾"	Iron	4 lbs.
85	¾"	Iron	4 lbs.
86	¾"	Iron	4 lbs.
88	¾"	Brass	4 lbs.

Illustrates appearance of Nos. 75, 77, 86 and 88 Relief Valves.

Reducing Valves

Plumbing fixtures are automatically guarded against excessive water supply line pressures by these time-tested, metal diaphragm operated Reducing Valves that have all-brass working parts. Standard factory pressure setting for delivery pressure of 45 lbs., with initial pressure of 150 lbs. If different setting desired, specify both initial and delivery pressures when ordering.

No.	Size	Made of	Weight
20	½"	Brass	4 lbs.
50	¾"	Iron	7 lbs.
60	¾"	Brass	6 lbs.
70	1"	Brass	11 lbs.

Thrush Relief Valves are tested, approved and listed as standard by the Underwriters' Laboratories and comply with A.S.M.E. boiler code requirements.

COMBINATION HIGH PRESSURE AND TEMPERATURE RELIEF VALVES

No.	Size	Made of	Weight
76	½"	Iron	3 lbs.
78	½"	Brass	3 lbs.
87	¾"	Iron	4 lbs.
89	¾"	Brass	4 lbs.

Similar in construction and for same purposes as high pressure relief valves, but with additional feature—temperature relief. A fusible plug melts from excessive temperature. Can be furnished from factory set at any pressure up to 150 lbs. Standard setting, 85 lbs. Specify when ordering if other than 85 lb. setting required.

THRUSH DUAL CONTROL UNITS

The Thrush Dual Control Units are made in three types. Standard and Master are constructed of brass, and No. 67 has brass working parts with cast iron housing.

These Units fill the system automatically with the proper amount of water, also automatically relieve excessive pressure. All are equipped with built-in strainer and are guaranteed against defects in workmanship and material.

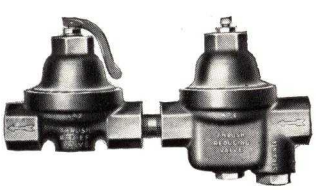
The Master Unit is bigger and has larger waterways for quicker filling.

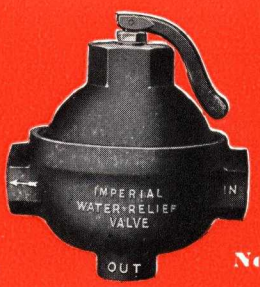
For more efficient operation install a Thrush Basement Pressure Tank in conjunction with a Thrush Dual Unit.

"Standard"

"Master"

No. 67



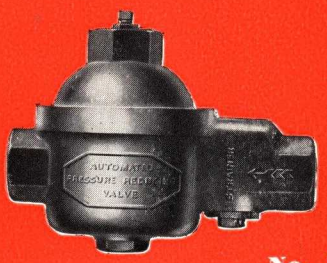


No. 30

No. 10

No. 11

No. 45



No. 50

No. 20

H. A. THRUSH & CO.

PERU, INDIANA

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ESTABLISHED 1888 • PIONEERS OF VACUUM STEAM HEATING

Webster Systems of Steam Heating

WARREN WEBSTER & COMPANY • CAMDEN, NEW JERSEY

Improved Systems 2

Central Controls 3

Radiator Valves 8

Metering Orifices 11

Radiator Traps 13

Drip Traps 13

Process Steam Traps 15

Vacuum Specialties 15

Steam Specialties 16

Boiler Return Traps 17

Boiler Protectors 17

Concealed Radiation 18

Unit Heaters 19

Sales Offices 20

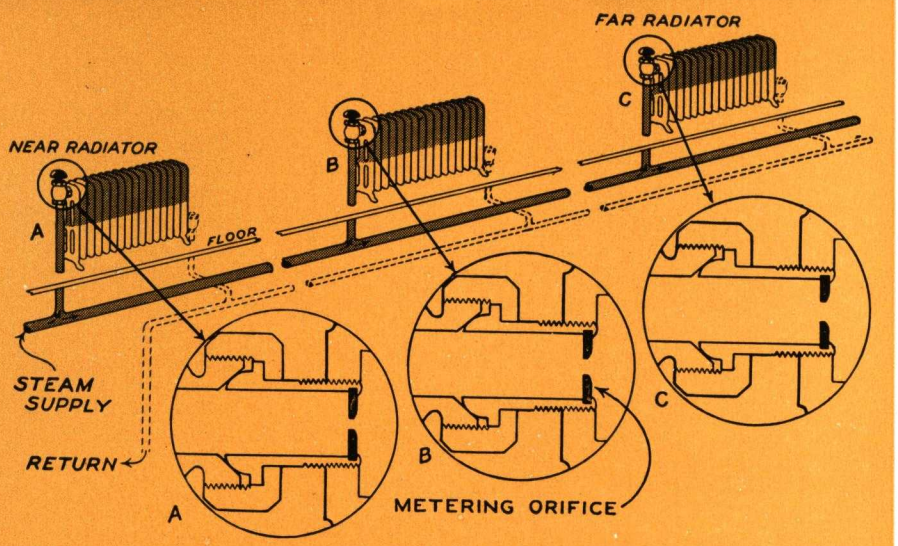

Fig. 1. Diagrammatic Sketch of the Improved Webster System

Showing how "pressure drop" is *equalized* or *balanced* by installation of standard metering orifices of proper size. While cast-iron radiation is illustrated the *same heating result* is attained with convection heating units

IMPROVED WEBSTER SYSTEMS OF STEAM HEATING

THE Improved Webster Systems are two-pipe vacuum or "vapor" systems of steam circulation *with the addition* of accurately sized metering orifices at the radiator supply connections, and, in such installations as require it, intermediate metering orifices at points in branch mains. Metering orifices, when properly selected and installed, effect even distribution of steam to all parts of the heating system and permit the successful application of a centralized control.

How Even Distribution Is Accomplished

In the older types of systems the nearest radiators become warm first while the farthest radiators do not begin to get warm until the others are filled. Now, in the Improved Webster Systems, *all radiators get steam at the same time and substantially in proportion to the need for steam.* In Fig. 1 it can be seen that the metering orifice in radiator A is quite small. When steam reaches this radiator the amount that can enter is therefore restricted. As a result the remaining steam quickly flows on through the piping to the next radiator B. Here the opening is slightly larger because the pressure of the steam by the time it reaches radiator B is lower. So it goes, radiator by radiator, to the farthest point. The "pressure drop" to each radiator has been equalized or balanced by installation of the correctly sized metering orifice. The result is that each radiator receives a proportionate amount of steam. When radiators are completely filled with steam Webster Thermostatic Traps close to prevent escape of steam into returns.

Flexible in Application

Improved Webster Systems are basic systems of steam circulation and use steam from boilers, engine or turbine exhaust, street lines, etc. They can be used with almost all types of direct radiation generally employed in steam heating practice.

Webster Radiator Valves and Thermostatic Return Traps are used on all radiators and heating units, and Webster Drip Traps where necessary on mains and risers. Webster Boiler Return Trap Equipment (see page 17) is used in open return and gravity installations, except where power driven condensation pumps are necessary. Steam or electric driven vacuum pumps are used on the returns of vacuum systems.

Improved Systems Are Controllable

An Improved Webster System without any control will be worthwhile because of its solution of distribution problems. But, to assure steam consumption economy, together with maximum comfort, *control of heating system operation* is the vitally important factor. The mere installation of a so-called "key-room" thermostat to open a burner or valve does not give adequate control of operation. To start with, the system must be controllable. The Improved Webster Systems are controllable by the application of a single, central control which assures economy of steam consumption and *moderates* excesses of over-heating and under-heating.

Where definite temperature control is desired at each individual radiator, the temperature control equipment may be used in conjunction with Improved Webster Systems.

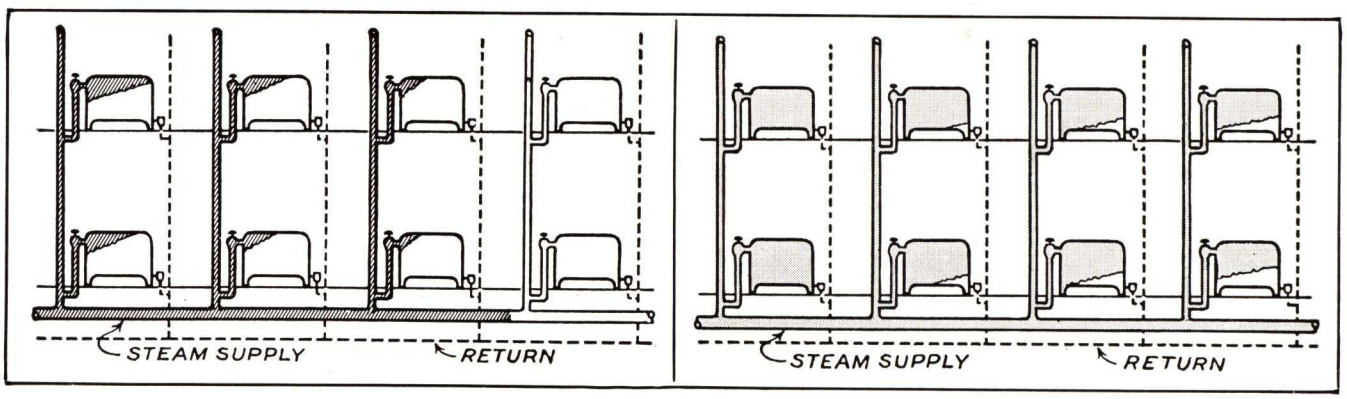

Fig. 2. *Unorificed* systems often result in uneven steam distribution as shown in the two sketches above. During mild weather (see sketch at left) radiators near the source of supply receive most of the steam while far radiators get little or none. Even in colder weather (see sketch at right) when pressure is increased, far radiators may not be completely filled although near radiators are filled and overheating. *The Improved Webster Systems using Webster Metering Orifices correct these faults and all radiators are evenly filled as shown in Fig. 1 at top of page.*

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WEBSTER E-3 ELECTRIC MODERATOR CONTROL

A Service Bulletin giving complete mechanical details and operation and maintenance instructions is available to supplement the brief description on this page and the next. Ask for Service Bulletin S-951.

Webster Central Controls

Webster Central Control Systems are provided in several types for use with Improved Webster Systems of Steam Heating. All types give these advantages:

(1) Prevent excesses of overheating and underheating characteristic of uncontrolled heating systems and of systems having only ordinary "on-and-off" controls. (2) Provide practically continuous heat delivery from radiators with either gravity or vacuum operation. (3) Eliminate loss due to careless or excessive window opening by placing steam consumption under control of operator. (4) Facilitate proper operation, the real basis for heating economy.

Webster Type E-3 Moderator Control

This type of control automatically varies the amount of steam supplied to the entire heating system in accordance with changes of outside temperature. It is provided in a standard arrangement (Fig. 3) using a single Webster Main Steam Control Valve. For most installations of average size where occupancy conditions are uniform throughout the building, the single valve arrangement is adequate and will be preferred because of lower first cost. Or two valves may be provided with a dual Outdoor Thermostat. For large installations, particularly where occupancy conditions vary in different portions of the building or in different buildings in a group making a multiplicity of valves desirable, the Webster Type EH or Air Moderator Controls on pages 5 and 6 are recommended.

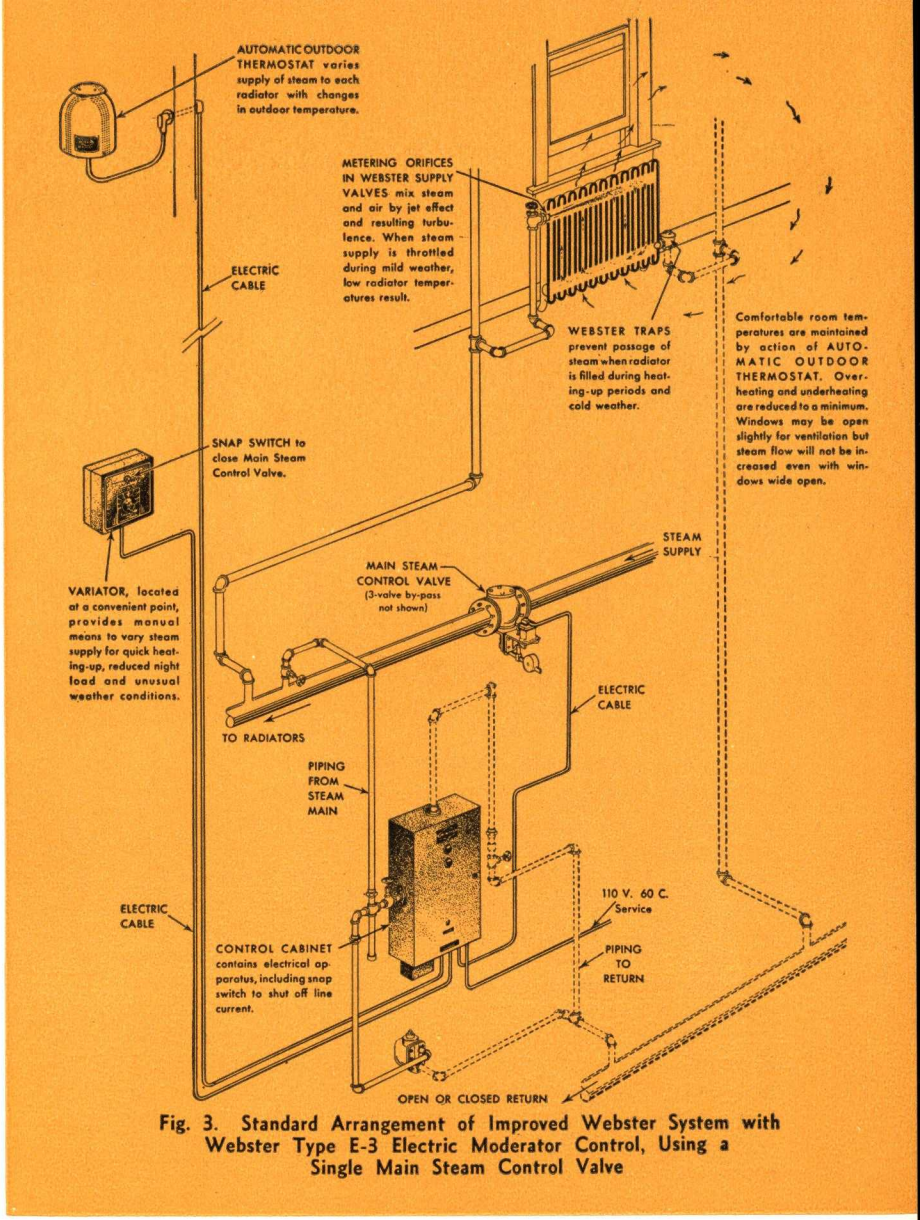

Fig. 3. Standard Arrangement of Improved Webster System with Webster Type E-3 Electric Moderator Control, Using a Single Main Steam Control Valve

How It Works

For the purpose of describing the Type E-3 Moderator System, Fig. 3 will be used. Steam may be delivered from high or low pressure boiler or from any other source. Return piping may be either "open" or "closed," as the E-3 Moderator Control regulates the pressure difference and will function equally well regardless of whether the pressure in the return piping is at atmosphere or below.

The Main Steam Control Valve is adjusted automatically by the electrical Moderator Control apparatus. The valve is motor-operated. The Moderator Control serves simply to reverse the direction of the motor, causing it to move the valve in the closing direction when less steam is required and in the opening direction when more steam is required.

The electrical Outdoor Thermostat provides the automatic "Control-by-the-Weather" feature varying steam flow in accordance with changes in outdoor temperature. At 70° F. outdoor temperature the Main Steam Control Valve will close almost entirely. At the extreme of 0° F. outdoor temperature (or —10° F. or +10° F. etc., depending on climate) the Outdoor Thermostat will cause the valve to open sufficiently to keep the radiators filled with steam. At intermediate outdoor temperatures, the Main Steam Valve is adjusted proportionately and radiators are fractionally or partially filled with steam. The position of the Control Valve thus selected automatically by the Outdoor Thermostat may be advanced or reduced by the Variator to give more or less steam than is called for by the outdoor temperature.

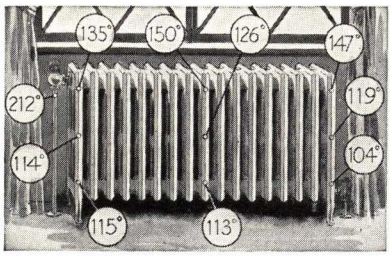

Fig. 4. Low Radiator Temperatures Obtained in Cast Iron Radiators with Webster Moderator Systems Throttling Steam Supply During Mild Weather.

These low temperatures are produced by "jet" effect of orifice (see Fig. 3) which causes steam and air in radiator to mix. Average radiator temperature is 125° F.

Compensation for Pressure Changes

Fluctuations in boiler pressure, in vacuum, in number of radiators turned on, etc., change the pressure difference in the heating system from that called for by the joint action of Outdoor Thermostat and Variator. These changes in pressure difference are compensated for automatically by a pressure-actuated mercury tube in the Control Cabinet which adjusts the throttling effect of the Control Valve.

WEBSTER TYPE E-3 MODERATOR CONTROL EQUIPMENT

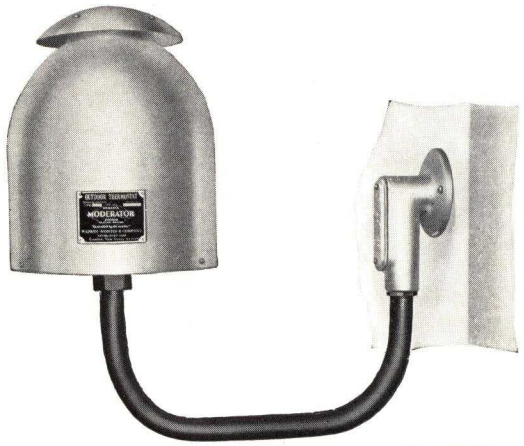

Fig. 5. Automatic Outdoor Thermostat Is 8⅞ In. Diameter by 11½ In. High

Automatic Outdoor Thermostat

Provides automatic "Control-by-the-Weather." It is simple, rugged and compact. Interior parts are mounted on cast iron base and sealed by aluminum housing. Entire device is protected from direct rays of sun by an aluminum shield. Ample space between shield and housing is provided for air circulation. Thermostatic element is a bimetallic coil expanding and contracting to move a contact arm over an electrical resistance. Change in resistance energizes control valve motor which adjusts the Control Valve. At 70° F. or higher outdoor temperature the Control Valve is completely closed. Single Thermostat for one-valve control; Dual Thermostat for two valves.

Installation—Placed on roof or outside wall using vertical pipe stand or horizontal bracket of conduit with condulett. Fittings for mounting not furnished with Thermostat. Must be connected to Control Cabinet by two No. 14 rubber covered, double braided wires to carry 24 volts. Approx. wt. is 45 lbs.

Variator

A small metal cabinet containing (1) adjustable knob for manual control of the steam supply and (2) snap switch to close Main Steam Control Valve. One required for each valve controlled.

Operation—Modifies action of Outdoor Thermostat. Turning knob to left reduces steam supply; turning right increases supply by desired *percentage*. Used principally for heating-up during early morning hours and for reduced evening or night heating. Occasionally for exceptional weather conditions such as winds, hot sun, cloudiness, etc. However "normal" setting will take care of average conditions of wind, sun and shade.

Fig. 6. The Variator Is 5⅝x5⅝x4⅞ In. in Size

Installation—Can be located on wall at any convenient operating station—the boiler room, superintendent's office, beside private exchange, etc. Adjustment is simple and may be made by stenographer or telephone operator. Must be connected to Control Cabinet by seven No. 14 rubber covered, double-braided wires to carry 24 volts. Approx wt. 15 lbs.

Main Steam Control Valve

Globe pattern, semi-balanced, double-seated disc type. Valve seats are Monel Metal while discs are phosphor bronze. Bodies are cast iron made with the best gray iron from metal patterns. All valves have flanged bodies but companion flanges are not included.

A standard induction type reversing motor opens and closes the valve through lever and linkage.

Installation—Installed in steam main usually with conventional 3-valve by-pass. One-valve by-pass may be used where considered adequate. Must be connected to Control Cabinet by five No. 14 rubber covered, double-braided wires to carry 24 volts for valve sizes up to 8 inches inclusive; three wires through relay (24 volt to 110 volt) for 10 and 12 inch valve sizes.

A service bulletin giving further mechanical details and maintenance instructions is available to supplement this brief description. Ask for Service Bulletin S-990.

Fig. 7. Type E-1M Main Steam Control Valve. Made in 2½ In. to 8 In. Sizes. Type E-1 for 10 In. and 12 In. Sizes

Control Cabinet

Contains standard electrical apparatus such as transformers, relays, fuses, etc., in addition to specially designed mercury contact U-tube. Has hinged cover for accessibility, with lock. Includes pilot light to show when control is in service and blinker light to show operation of Control Valve. Also a snap switch for shut-off of line current. One required for each valve controlled.

Installation — Bolted or screwed to wall near Control Valve. Electrical service (100 watts, 110 volts, 60 cycle a-c) to operate control system is brought to this cabinet. For d-c. current, a Rotary Convertor should be provided. Piping connections made from cabinet to steam and return mains. A Webster Size 00026-O Drip Trap is required. Approx. wt. 85 lbs.

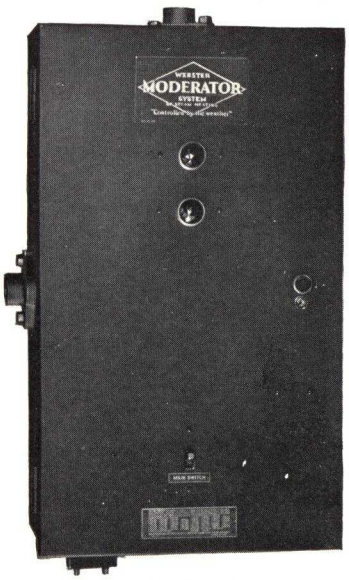

Fig. 8. Control Cabinet Is 16x28x6 In. in Size

WEBSTER EH ELECTRIC MODERATOR CONTROL

A Service Bulletin giving complete mechanical details and operation and maintenance instructions is available to supplement the brief description below. Ask for Service Bulletin S-961.

With this control the heating of any number of buildings or zones served from a single steam source may be controlled from a single central operating station, providing substantially the same *heating effect* as other types of Webster Moderator Systems. It is therefore advantageous for colleges and universities, hospitals, religious and public institutions, housing projects, etc.

The Type EH Moderator System provides means at the central operating station for completely shutting off heat to each zone, building, or group of buildings, depending on the arrangement installed. If some buildings require more steam or less steam during certain periods, this can be accomplished also.

Undue fluctuation in demand on boiler and central station load is avoided by automatically synchronizing the operation of the several Main Steam Control Valves in each installation. There is no undue fluctuation in boiler pressure or in rate of return of condensate to boiler or to point of disposal.

Equipment Required

Is electrical and consists of Webster Outdoor Thermostat, Control Cabinet and Steam Control Valve equipment. A diagrammatic arrangement for a group of four buildings, each served by its own Main Steam Control Valve, is shown in Figure 9. An Outdoor Thermostat is located on the outside wall or roof of the central operating station. A Control Cabinet placed at a convenient point in the operating station is connected to the Outdoor Thermostat by 3 No. 14 wires. A Main Steam Control Valve, with an accompanying Relay Cabinet, serves each building (or group of buildings if desired). These Valves are connected to the Control Cabinet by low voltage wires in cables which can be run in the steam main tunnel, underground in "Parkway" cable or in conduit, or overhead on poles. Standard electrical type cable terminal boxes are used where required.

The automatic Outdoor Thermostat is similar to that used with the Webster Type E-3 Moderator System and is illustrated and described on page 4.

The Control Valves are Webster Type E-1M or E-1 Valves (see Fig. 7) which, in conjunction with Pressure Controllers, maintain a constant pressure difference between supply and return mains.

The Control Cabinet contains the mechanism which produces the "pulsating flow" operation, opening and closing the Control Valves in accordance with the cycle selected by the Outdoor Thermostat and Variator. Snap Switches for opening and closing the Control Valves, other switches and pilot lights for the various electrical circuits, as well as the outdoor temperature indicator are all included.

A small by-pass is often placed around the Webster Main Control Valve to heat the mains in the morning or after a shut-down. A small motorized valve may be placed in this by-pass to shut off steam when latter is not required.

How It Works

Steam passes into system through Webster Main Control Valve in pulsations of varying length but at uniform pressure difference. The flow starts when Control Valve is open and ends when it is closed. For the average building, the Control Valve completes its cycle of operation in from eight to fifteen minutes, the time being selected for the particular installation. For purpose of explanation, assume a cycle of eight minutes. During periods of coldest temperature, Main Valve may be open continuously. If outside temperature rises somewhat it may be open seven minutes and closed one minute. If temperature rises still further, the open period becomes six minutes and the closed period two minutes. And so on, until during very mild weather, Main Valve will be open one minute or less and closed seven minutes or more. There are certain applications which may require a relatively longer cycle. One-pipe systems, unorificed systems or systems in which mains are too small or trapped beyond correction might use a considerably longer cycle.

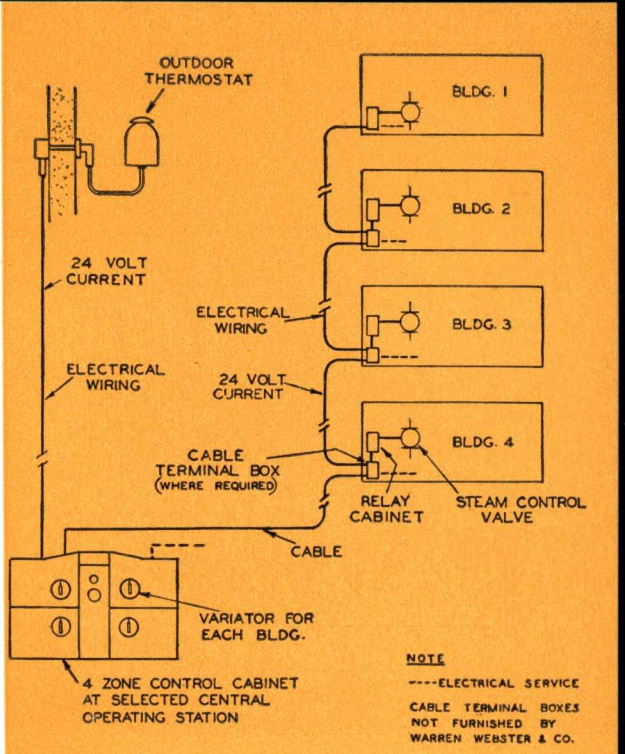

Fig. 9. Diagrammatic Arrangement of Webster Type EH Moderator Control Equipment. Electrical Current (110 Volts, 60 Cycle, A-c.) Is Supplied to Control Cabinet and Each Relay Cabinet for Operation

The correct "on" interval is selected automatically by the Outdoor Thermostat in accordance with the outside temperature. On the Control Cabinet is the Variator which allows operator to manually modify the automatic outdoor control. In effect, this Variator allows operator to increase or decrease steam delivery to take care of weather and occupancy conditions other than outdoor temperature. A Variator is generally provided for each building or zone; however, if a number of buildings have similar heating schedules they can be grouped and controlled with one Variator.

Electric Hylo Control

A pulsating flow control similar to the Type EH Moderator System except that the automatic Outdoor Thermostat is omitted and control is manual or with indoor thermostat or schedule clock, and consequently lower in first cost. Particularly suitable, in single zone form, for smaller buildings taking steam from street mains.

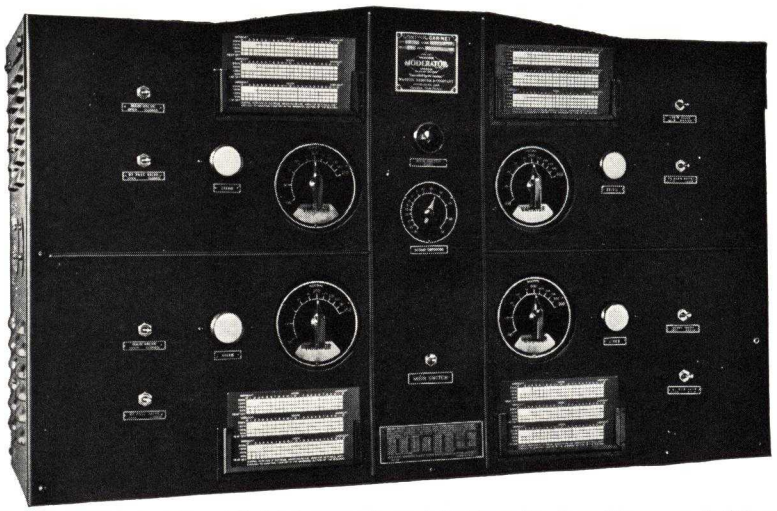

Fig. 10. Webster Type EH Moderator Control Cabinet for Four Zones or Buildings. This Cabinet Is Approximately 37 In. Long, 21 In. High and 13 In. Deep

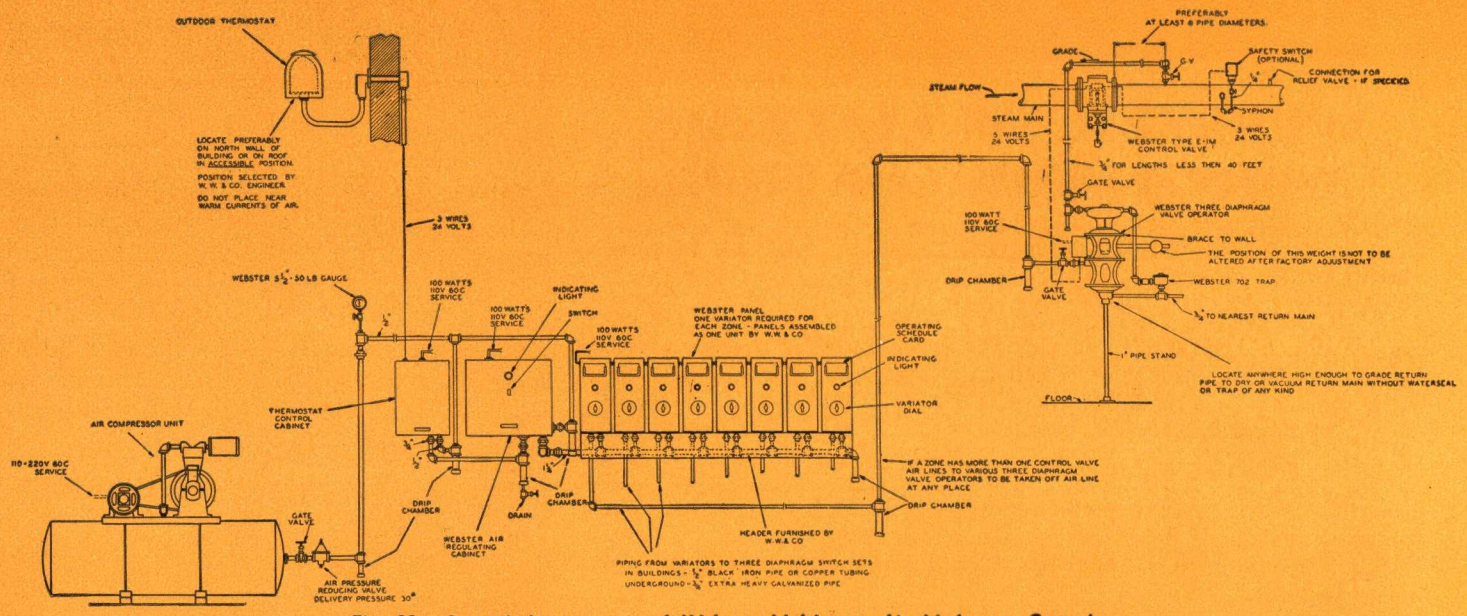

Fig. 11. General Arrangement of Webster Multi-zone Air Moderator Control

WEBSTER AIR MODERATOR CONTROL

The Air Moderator System is a continuous-flow, central control employing compressed air and electricity as mediums for operation. Applicable to large zoned buildings or groups of buildings using two or more main Steam Control Valves. Results in comfort and economy are the same as with other Webster Moderator Controls.

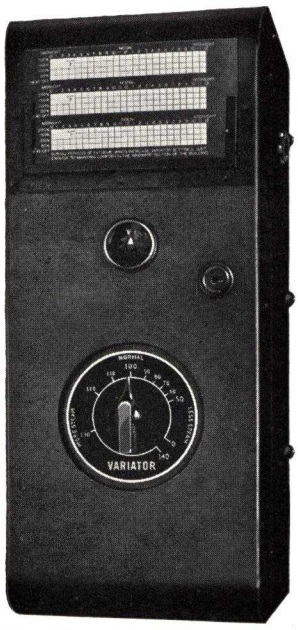

Fig. 12. Webster Air Variator. One required for each zone. Each approx. 7½x18x8⅝ in. in size

Uses Outdoor Thermostat (see Fig. 5, page 4) to automatically vary the steam supplied to entire heating system (all zones) for changes in outside temperature. Variators, one for each zone, provide supplementary manual control for heating-up, to increase or decrease heat for unusual weather or occpancy conditions, and for shut-off. Each variator (see Fig. 12) includes a lamp which lights when heat is on and a frame for operating schedule cards prepared for each installation. One or more Control Valves can be controlled from each Variator, adjustment of which changes steam flow to all Control Valves in that zone in same proportion. The required number of Variators is furnished assembled as a unit.

Main Steam Control Valves are Webster Type E-1M and E-1 described on page 4 and in figure 7. Motors energized by 3-diaphragm Valve Operator (Fig. 11) adjust Control Valves. Pressure fluctuations in supply and return mains are compensated for automatically by Valve Operators. An air compressor is furnished where compressed air supply is not already available.

How It Works

Air from compressor (Fig. 11) or other source passes through reducing valve to Thermostat Control Cabinet. Electric Outdoor Thermostat in circuit with motor-controlled air valve produces "pilot" air pressure proportional to outdoor temperature. This "pilot" air pressure controls separate air flow from Compressor through Air Regulating Cabinet to Variators, providing *all* Variators with air pressure proportional to outdoor temperature. Adjustment of individual Variators changes air pressure to Valve Operators in zone. These Valve Operators adjust Control Valves and thus produce corresponding steam pressure differences in heating system of zone.

Single-Zone Air Moderator System

For application to smaller buildings or groups whose heating requirements can be met by a single Variator and one or more Main Steam Control Valves. Diagrammatic arrangement similar to Fig. 11 except that Air Regulating Cabinet is omitted and only one Variator is employed. Optional equipment includes (1) a snap switch to remotely close Control Valve and (2) an automatic overheat limit indoor thermostat furnished with or without schedule clock.

WEBSTER TYPE SP HYLO STEAM VARIATOR CONTROL

A Service Bulletin giving complete mechanical details and operation and maintenance instructions is available to supplement this brief description. Ask for Service Bulletin S-941.

Fig. 13. Webster Type SP Hylo Steam Variator Cabinet

Right hand dial is set for outdoor temperature. Left hand dial is usually set at normal but may be increased to 150% of normal for heating-up or reduced to 50% of normal for night or special requirements. Switch in center provides for remote shut-off. A schedule card (in frame at bottom) assists in economical operation. The Type SP Cabinet may be located at a convenient operating point.

A central control system of the graduated, continuous flow type which varies steam supply to the entire heating system in accordance with changes in outdoor temperature. Provides a *simple, rugged* and *dependable* control for the smaller building. Consists of Type SP Hylo Steam Variator Cabinet (Fig. 13) and Type E-1M Main Steam Control Valve (Fig. 7, page 4). Adjustment of control dials causes motor to adjust Control Valve in steam main (Fig. 15). Ordinary pressure variations in supply and return mains are compensated for automatically by two sensitive diaphragms. Adjustment of temperature dial may be made by reference to thermometer located outdoors, or remote reading thermometer may be mounted near control cabinet. Schedule clock for automatic shut-off or indoor thermostat for automatic overheat limit shut-off are optional.

Applicable to two-pipe orificed systems, either vacuum or vapor, using low pressure steam from any source. May also be applied with minor modifications to directly control stoker motors (Fig. 17), motor operated draft dampers on hand-fired coal boilers (Fig. 16), or blowers.

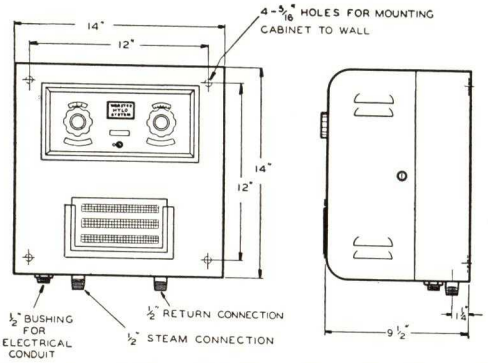

Fig. 14. Dimensions of Control Cabinet, Type SP Webster Hylo Steam Variator

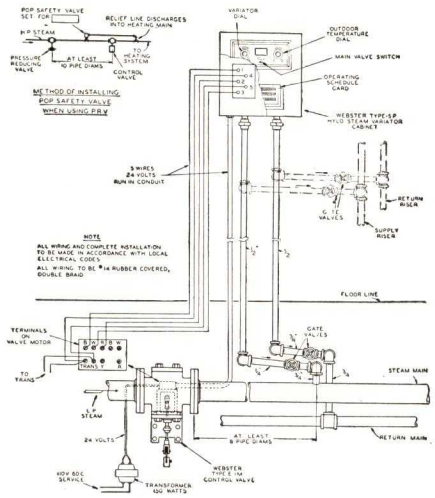

Fig. 15. General Arrangement of Type SP Webster Hylo Steam Variator Controlling Webster Type E-1M Valve

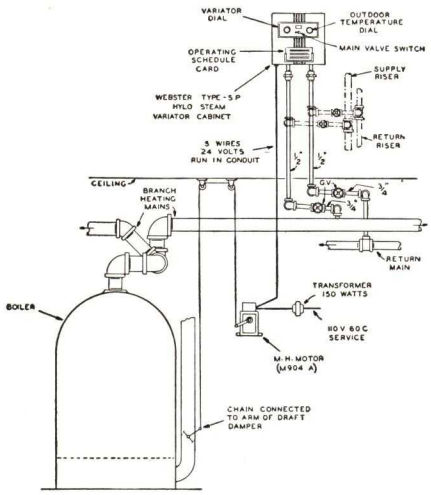

Fig. 16. General Arrangement of Type SP Webster Hylo Steam Variator Controlling Draft Damper on Hand-Fired Coal Burning Boiler. The same arrangement is used when motor operates a modulating type stoker. Here the chain is connected to arm of stoker.

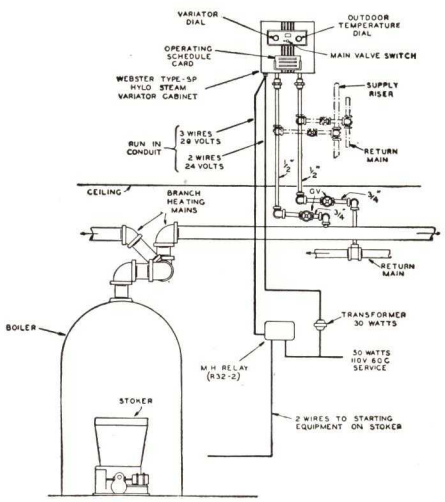

Fig. 17. General Arrangement of Type SP Webster Hylo Steam Variator Controlling "On-and-Off" Type. See Fig. 16 for Modulating Stoker

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45

WEBSTER SYSTEM EQUIPMENT

Used as needed in Webster Systems of Steam Heating and includes the following:

Webster "Three-Point" Radiator Valve

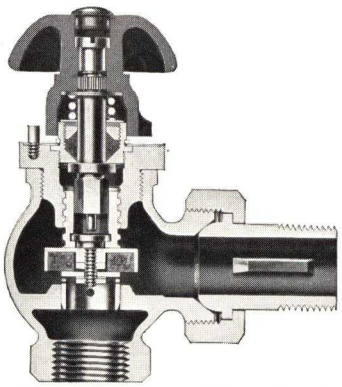


Fig. 18. Webster "Three-Point" Valve

The finest Webster Radiator Valve. Incorporates sleeve orifice feature of improved Webster Systems with choice of *open-shut* operation or "three-point" providing *shut, normal* and *excess* positions. *Excess* position permits 140% of normal heat in installations with Webster Central Controls. The "Three-Point" feature is especially desirable for hospitals, hotels, apartments and homes where extra flexibility is desired.

Usually shipped for *open-shut* operation but the "three-point" feature is quickly obtainable by reversing dial plate.

Other design and construction features: Quick-opening non-rising stem, special die-molded ring packing gland which meets usual "packless" specification requirements. Body of high grade cast steam brass and of ample section throughout, no skimping. Nipples in most-used 1/2, 3/4 and 1-inch sizes are machined from solid brass bar stock with strong integrally broached lugs. Union nuts in these sizes also machined from solid brass. Nuts and nipples in little used 1 1/4-inch size are of cast brass. Renewable Jenkins composition disc securely fastened in self-centering disc holder, generous seat dimensions.

Available in angle, right-corner, left-corner and straightway (*single union only*) models with bakelite wheel handle, or lever, lockshield or extended steam fixtures as shown in Table X and Fig. 23 (except flush handle). Sizes 3/4 and 1 inch only. Dimensions same as corresponding sizes of Webster Type "W" Valves. See Tables I, II and III.

Webster Type "W" Radiator Valve

Fig. 19. Webster Type "W" Valve

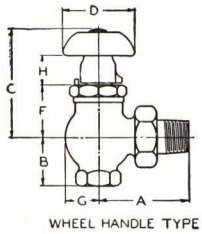
Same high quality as Webster "Three-Point" Radiator Valve, except that "Three-Point" features are omitted and slotted sleeve or plug included to provide "modulation" in either orificed or unorificed installations. Sizes 3/4 and 1 inch have sleeves; sizes 1/2 and 1 1/4 inch use plugs. Successful "modulation" requires that proper pressure be maintained on system.

All other design and construction features same as "Three-Point" Valve described above.

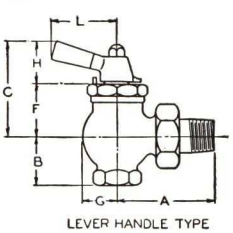
Available in angle, right-corner, left-corner, straightway single union and straightway double union models with bakelite wheel, lever, lockshield, chain wheel or extension stem handles. Available in sizes and models listed in Tables I, II and III.

TABLE I. Dimensions of Webster Type "W" Valves

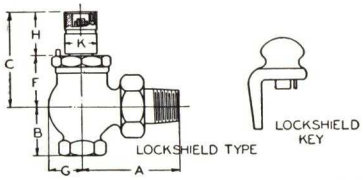
Angle Body with Wheel (Standard), Lever, and Lockshield Handles



WHEEL HANDLE TYPE



LEVER HANDLE TYPE



Size	Symbol	All types				Wheel handle		
		A	B	F	G	C	D	H
1/2"	202H	2 13/16	1 1/4	1 1/2	1	3 5/16	2 1/4	1 5/16
3/4"	203H	2 15/16	1 1/2	1 11/16	1 1/8	3 7/16	2 1/4	1 5/16
1"	204H	3 3/16	1 3/4	1 7/8	1 5/16	4 3/16	3	1 1/4
1 1/4"	205H	3 9/16	2	2 1/8	1 1/2	4 7/16	3	1 1/4

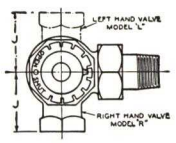
Size	Symbol	Lever handle			Lockshield		
		C	H	L	C	H	K
1/2"	202H	3	1 1/2	2 3/16	2 7/8	1 7/16	1
3/4"	203H	3 3/16	1 1/2	2 3/16	3 1/16	1 7/16	1
1"	204H	3 3/4	1 7/8	2 5/16	3 11/16	1 13/16	1 1/8
1 1/4"	205H	4	1 7/8	2 5/16	3 15/16	1 13/16	1 1/8

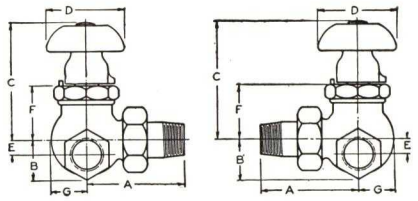
All dimensions in inches and subject to slight variation.

TABLE II. Dimensions of Webster Type "W" Valves

Right-corner and Left-corner Bodies with Wheel Handle

See Table I for dimensions of lever and lockshield handles.





Size	Symbol		A	B	C	D	E	F	G	J
	Right	Left								
1/2"	212R	222L	2 13/16	1 1/8	3 7/16	2 1/4	3/8	1 5/8	1	1 1/2
3/4"	213R	223L	2 15/16	1 1/4	3 9/16	2 1/4	7/16	1 13/16	1 1/8	1 5/8
1"	214R	224L	3 3/16	1 1/2	4 3/8	3	1/2	2 1/16	1 5/16	2

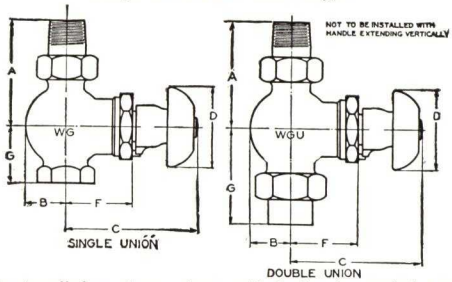
All dimensions in inches and subject to slight variation.

TABLE III. Dimensions of Webster Type "W" Valves

Straightway Bodies with Wheel Handles

See Table I for dimensions of lever and lockshield handles.

Single and Double Union Types

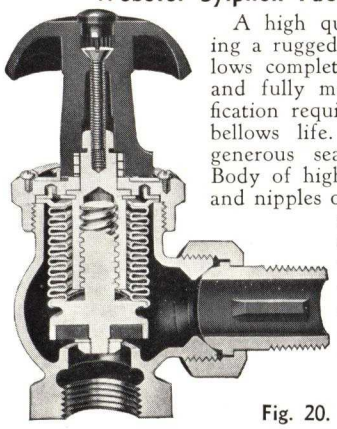


To be installed as shown above with bodies in vertical position

Size	Symbol	A	B	C	D	F	G
Single Union							
1/2"	232G	2 7/8	1 5/16	3 9/16	2 1/4	1 3/4	1 1/2
3/4"	233G	3	1 1/16	3 11/16	2 1/4	1 7/8	1 5/8
1"	234G	3 1/8	1 5/16	4 1/2	3	2 3/16	2
Double Union							
3/4"	243GU	3	1 1/16	3 11/16	2 1/4	1 7/8	2 9/16
1"	244GU	3 1/8	1 5/16	4 5/8	3	2 3/16	2 7/8

All dimensions in inches and subject to slight variation.

Webster Sylphon Packless Radiator Valve

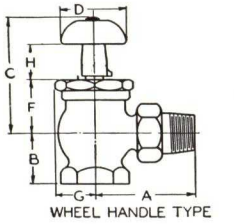


A high quality radiator valve incorporating a rugged, flexible laminated Sylphon bellows completely enclosing a non-rising stem and fully meeting "bellows packless" specification requirements. Low lift assures long bellows life. Renewable composition disc, generous seat dimensions. Quick-opening. Body of high grade cast steam brass. Nuts and nipples of cast brass. Available in angle, right-corner, left-corner and straightway single union models with choice of wheel, lever, lockshield, chain wheel or extension stem handles. Available in the sizes and models listed in Tables IV, V and VI.

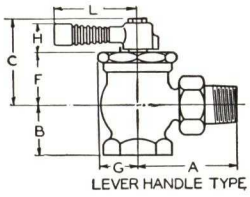
Fig. 20. Webster Sylphon Packless Valve

TABLE IV. Dimensions of Webster Sylphon Packless Valves

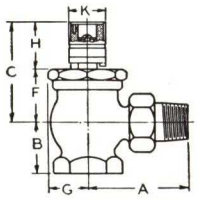
Angle Body with Wheel (Standard), Lever, and Lockshield Handles



WHEEL HANDLE TYPE



LEVER HANDLE TYPE



LOCKSHIELD TYPE

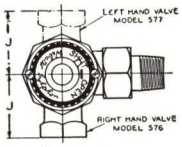
LOCKSHIELD KEY

Size	Symbol	All types				Wheel handle		
		A	B	F	G	C	D	H
1/2"	575H	2 5/8	1 1/4	1 9/16	1	3 1/2	2 1/8	1 1/8
3/4"	575H	2 3/4	1 3/8	1 5/8	1	3 9/16	2 1/8	1 1/8
1"	575H	3 1/8	1 3/4	2 1/8	1 5/16	4 5/16	2 5/8	1 3/16
1 1/4"	575H	3 5/8	1 7/8	2 1/8	1 5/16	4 5/16	2 5/8	1 3/16
1 1/2"	575H	3 7/8	2 3/16	2 5/16	1 1/2	4 7/8	3	1 1/2
2"	575H	4 3/8	2 7/16	2 5/16	1 1/2	4 7/8	3	1 1/2

Size	Symbol	Lever handle			Lockshield		
		C	H	L	C	H	K
1/2"	575H	2 9/16	1 3/16	2 1/8	2 13/16	1 1/4	1 5/16
3/4"	575H	2 11/16	1 3/16	2 1/8	2 7/8	1 1/4	1 5/16
1"	575H	3 3/16	1 3/16	2 1/16	3 3/8	1 1/4	1 5/16
1 1/4"	575H	3 3/16	1 3/16	2 1/16	3 5/16	1 1/4	1 5/16
1 1/2"	575H	3 3/8	1 3/16	2 5/8	3 9/16	1 1/4	1 5/16
2"	575H	3 3/8	1 3/16	2 5/8	3 9/16	1 1/4	1 5/16

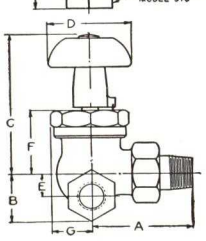
All dimensions in inches and subject to slight variation.

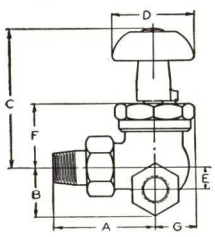
TABLE V. Dimensions of Webster Sylphon Packless Valves



Right-corner and Left-corner with Wheel Handles

See Table IV for dimensions of lever and lockshield handles.

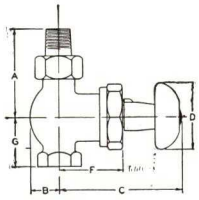




Size	Symbol		A	B	C	D	E	F	G	J
	Right	Left								
1/2"	576R	577L	2 5/8	1 1/4	3 9/16	2 1/8	9/16	1 5/8	1	1 5/8
3/4"	576R	577L	2 3/4	1 9/16	3 5/8	2 1/8	11/16	1 11/16	1	1 3/4
1"	576R	577L	3 1/8	2	4 3/8	2 5/8	1 1/16	2 3/16	1 5/16	2 1/16

All dimensions in inches and subject to slight variation.

TABLE VI. Dimensions of Webster Sylphon Packless Valves



Straightway Bodies with Wheel Handles

See Table IV for dimensions of lever and lockshield handles.

Single Union Type

To be installed only as shown here with body in vertical position

Size	Symbol	A	B	C	D	F	G
1/2"	578G	2 13/16	7/8	3 7/8	2 1/8	1 15/16	1 9/16
3/4"	578G	2 7/8	1	4 1/16	2 1/8	2 1/8	1 3/4
1"	578G	3 9/16	1 1/4	5 1/8	2 5/8	2 15/16	2 1/4

All dimensions in inches and subject to slight variation.

Webster Type "B" Radiator Valve

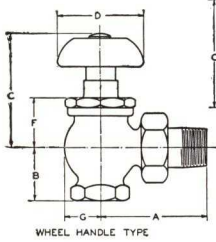
A good quality radiator valve. Quick-opening, non-rising stem, molded ring packing gland meets usual "packless" specification requirements. Steam brass body with forged or cast brass cap. Union nuts and nipples made from bar stock in 1/2, 3/4 and 1-inch sizes; of cast brass in larger sizes. Renewable composition disc securely fastened in disc holder.

Made in angle, left-corner, right-corner, straightway single union and double union body models. Bakelite wheel, lever, lockshield or extended stem handles. Available in sizes listed in Tables VII, VIII and IX.

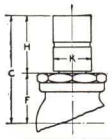
Fig. 21. Webster Type "B" Radiator Valve

TABLE VII. Dimensions of Webster Type "B" Valves

Angle Body with Wheel (Standard) and Lockshield Handles



WHEEL HANDLE TYPE



LOCKSHIELD TYPE

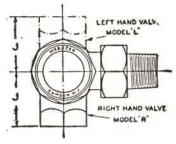
LOCKSHIELD KEY

See Table I for dimensions of lever handle.

Size	Symbol	Wheel handle						Lockshield		
		A	B	C	D	F	G	C	H	K
1/2"	402H	2 3/4	1 3/8	3	2 1/4	1 5/16	15/16	2 9/16	1 1/4	1
3/4"	403H	2 3/4	1 3/8	3	2 1/4	1 5/16	15/16	2 9/16	1 1/4	1
1"	404H	3 1/8	1 3/8	3 1/4	2 1/4	1 1/2	1 1/16	2 7/8	1 3/8	1
1 1/4"	405H	3 5/8	1 7/8	4 9/16	3	2 5/16	1 5/16	3 7/8	1 9/16	1
1 1/2"	406H	3 7/8	2 3/16	4 3/4	3	2 1/2	1 5/8	4 1/16	1 9/16	1
2"	408H	4 3/8	2 7/16	4 3/4	3	2 1/2	1 3/4	4 1/16	1 9/16	1

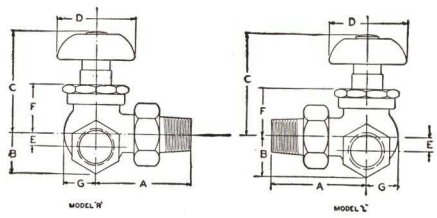
All dimensions in inches and subject to slight variation.

TABLE VIII. Dimensions of Webster Type "B" Valves



Right-corner and Left-corner Bodies with Standard Wheel Handle

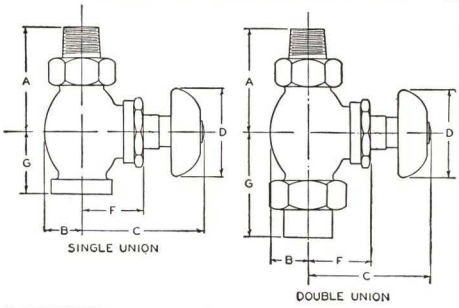
See Table VII for dimensions of lockshield handle.



Size		Symbol		A	B	C	D	E	F	G	J
Inlet	Outlet	Right	Left								
¾″	½″	412R	422L	2¾	1 13/16	3	2¼	⅜	1 5/16	15/16	1 9/16
¾″	¾″	413R	423L	2¾	1 13/16	3	2¼	⅜	1 5/16	15/16	1 9/16

All dimensions in inches and subject to slight variation.

TABLE IX. Dimensions of Webster Type "8" Valves



Straightway Bodies with Standard Wheel Handle

See Table VII for lockshield dimensions

Single and Double Union Types

Install only as shown with bodies in vertical position

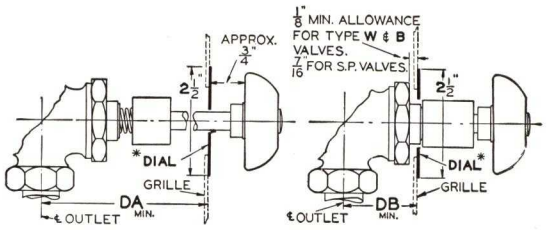
Size		Symbol	A	B	C	D	F	G
Inlet	Outlet							
Single Union								
¾″	½″	432G	3	1	3¼	2¼	1 9/16	1 5/8
¾″	¾″	433G	3	1	3¼	2¼	1 9/16	1 5/8
1″	1″	434G	3¼	1 1/8	3 3/8	2¼	1 5/8	1 7/8
Double Union								
¾″	¾″	443GU	3	1	3¼	2¼	1 9/16	2 11/16
1″	1″	444GU	3¼	1 1/8	3 3/8	2¼	1 5/8	2 13/16

All dimensions in inches and subject to slight variation.

Radiator Valve Symbols

To indicate choice of handle, prefix symbols in Tables I to IX incl., with letter "W" for wheel handle, "L" for lever handle, "LS" for lockshield, "C" for chain wheel (Fig. 22). For Long Stem Type (Table X) use "ES" and for Extended Stem (Fig. 23) use "E" in addition to symbol for handle, i.e., ESW402H.

TABLE X. Dimensions of Special Long Stem Handles for All Types of Webster Supply Valves



*STANDARD DIAL has plain satin finish without marking. Special graduated dial made up on order at extra cost.

Size	Minimum Distance for DA Model (see below)			Minimum Distance for DB Model (see below)		
	H	G & GU	R & L	H	G & GU	R & L
"W" and "Three-Point" Valves						
½″	3 3/16	3 7/16	3 5/16	1 5/8	1 7/8	1 3/4
¾″	3 3/8	3 7/16	3 1/2	1 13/16	2	1 15/16
1″	3 3/8	†4 1/8	4	2	†2 5/16	2 3/16
1¼″	4 1/16	...	...	2¼	...	...
"B" Valve						
½″ & ¾″	2 13/16	3 1/16	2 13/16	1 7/16	1 11/16	1 7/16
1″	3	3 1/8	...	1 5/8	1¾	...
1¼″	4 3/16	...	...	2 7/8	...	...
1½″ & 2″	4 3/8	...	...	3 1/16	...	...

Sylphon Packless Valve

½″	2 7/8	3¼	2 13/16	2	2 3/8	2 1/16
¾″	2 15/16	3 7/16	3	2 1/16	2 9/16	2 1/8
1″	3 7/16	4¼	3½	2 1/16	3 3/8	2 5/8
1¼″	3 7/16	...	...	2 1/16	...	...
1½″	3 5/8	...	...	2¾	...	...
2″	3 5/8	...	...	2¾	...	...

All dimensions in inches and subject to slight variation.
†On 1-in. Type W Valves, Model GU, the minimum DA is 4¼-in. and the minimum DB is 2 7/16-in.
Model H is angle body; Model G is straightway single union; Model GU straightway double union; Model R is right-corner; Model L is left-corner.

Supply Valve Handles

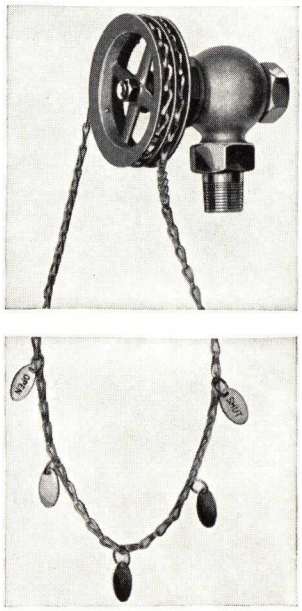


Fig. 22. Chain Wheel Handle

The wheel ("mushroom") handle of Bakelite is furnished with Webster Supply Valves unless another type is specified. Lever handle or lockshield cover as shown in the dimension tables will be furnished upon request.

Special attachments include a chain wheel with a 6 ft. chain drop for radiators installed beyond reach (see Fig. 22). For certain types of enclosed radiation, Special Long Stem Handles or Extended Stem Fixtures are used. The Long Steam Handle (Table X) is rigid and is used chiefly where handle must be at a short distance from valve. Available in wheel, lever or lockshield types. The Extended Stem Fixture (Fig. 23) will operate to a maximum of 15° from vertical and is used chiefly where handle is on top of radiator enclosure. In Fig. 23 view 1 is the wheel handle, 2 and 3 are top and side views of the flush-type handle, 4 and 5 are the key and lockshield cover while 6 is the lever handle.

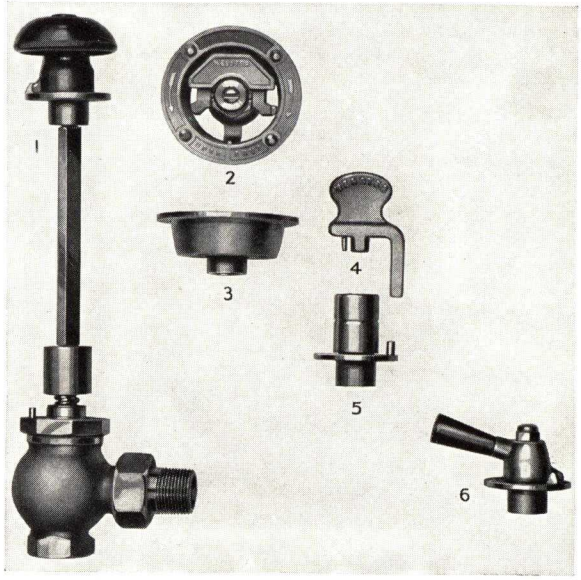


Fig. 23. Extended Stem Fixtures for Webster Supply Valves

Pressures—Webster Radiator Valves are for use with low pressure Webster Systems of Steam Heating where boiler pressures do not generally exceed 2 lbs. per sq. in. However, Webster Valves will not be detrimentally affected by occasional pressures up to 25 lbs. per sq. in.

Selection of Valves for Unorificed Webster Systems

The ratings given in Table XI, following, apply to all Type "W," Type "B," Sylphon Packless and Double Service Valves when used *without* orifices in Standard Webster Systems.

TABLE XI. Ratings of Unorificed Webster Supply Valves in Sq. Ft. E.D.R.

Valve size, in.	Residences, small buildings, Type "R" system	Large buildings, schools, apartments, factories, Type "R" or Vacuum System
	Press. diff.—4 oz.	Press. diff.—8 oz.
½	35 sq. ft.	50 sq. ft.
¾	80 sq. ft.	110 sq. ft.
1	130 sq. ft.	185 sq. ft.
1¼	225 sq. ft.	315 sq. ft.
1½ & 2	320 sq. ft.	450 sq. ft.

Selection of Valves for Orificed Webster Systems

The schedule of valve sizes given in Table XII, following, apply to all Type "W," "Three-Point," Type "B," Sylphon Packless and Double Service Valves when used with orifices in Improved Webster Systems.

TABLE XII. Ratings of Orificed Webster Supply Valves in Sq. Ft. E.D.R.

Valve size, in.	A—Standard	B—Optional
	Sq. ft. E. D. R.	Sq. ft. E. D. R.
½	0–50	0–35
¾	Above 50–110	Above 35–80
1	Above 110–185	Above 80–130
1¼	Above 185–315	Above 130–225
1½ & 2	Above 315–450	Above 225–320

Direct Radiators—With Orificed Systems, the supply valves of radiators are provided with a cup, push-seat, nipple or sleeve-orifice, the latter as in the "Three-Point" Valve. Valves should be selected of such size that practically no pressure drop occurs through the valve itself. Steam delivery then depends upon the size of the orifice and the pressure difference across it. The suggested sizes in Table XII-A can be used for most installations. There may be applications where it is desirable to have valve sizes larger. Occasionally a larger valve may be preferred for appearance. In such cases, Table XII-B may be used.

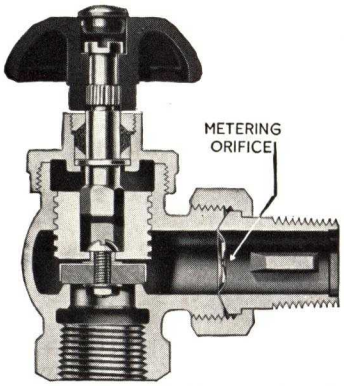


Fig. 24. Cup-type Metering Orifice Used in Radiator Supply Valve

Webster Metering Orifices

These are discs with a restricted opening, the size of which is determined by the amount of radiation, the distance (equivalent pipe length) of the radiator from the source of supply and, in tall buildings, the effect of altitude.

The size of orifices, to be installed at each radiator is selected by the engineers of the nearest Webster branch office, who are equipped with complete data to make possible a proper selection.

The discs for cup, push-seat and nipple-type orifices are of heavy gauge Monel Metal to resist erosion and corrosion, amply thick to be free from vibration and shaped for silent operation. The sleeve-type orifice as furnished with the Three-Point Valve (Fig. 18) is of brass. For concealed radiators and convectors, for special applications, for existing installations using earlier types of Webster Valves and for all valves of other makes these Orifices may be obtained in both standard and special types, to meet conditions and permit low cost modernization. Some of these types are shown in Figs. 27 and 29.

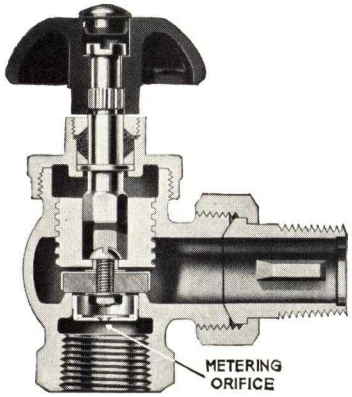


Fig. 25. Push-seat Metering Orifice Used in Radiator Supply Valve

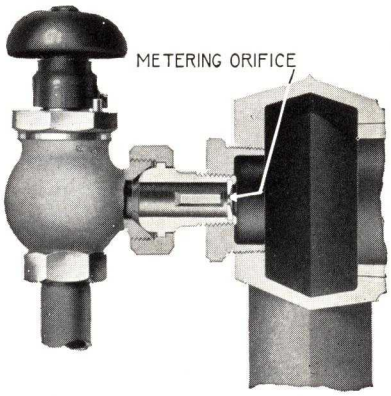


Fig. 26. Metering Orifice in Nipple of a Webster Supply Valve

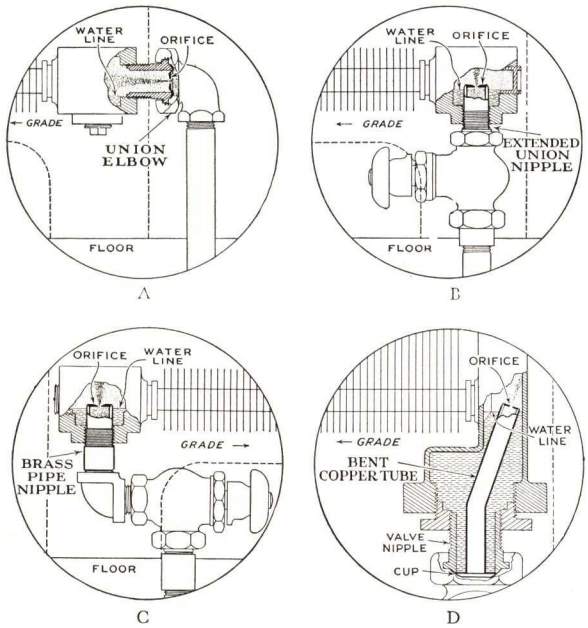


Fig. 27. These Special Webster Orifice Fittings Are Used for Concealed Radiation

Sketch A shows a standard cup-type orifice in a union elbow applied to cabinet radiation with end connections when supply valve is located below basement ceiling. Sketches B and C show method of orificing concealed radiation having bottom connections. In Sketch B, the orifice is furnished in an extended union nipple. In Sketch C it is furnished in an extended brass pipe nipple. Sketch D illustrates a Special Bent Tube Orifice used with concealed radiators having off-set type headers.

Intermediate Metering Orifices

Provided for installation in branch mains to assist in primary distribution. Made of brass plate and provided with two attached copper asbestos gaskets and suitable lugs for mounting in pipe lines between union flanges and between companion flange and gate valve. They are supplied on special order in standard pipe sizes between 2 in. and 12 in. inclusive.

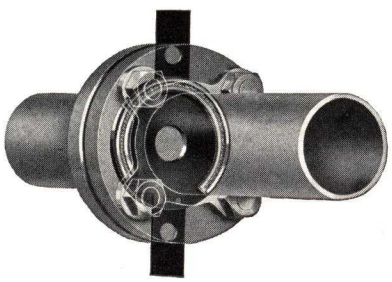


Fig. 28. Webster Intermediate Metering Orifice between union flanges

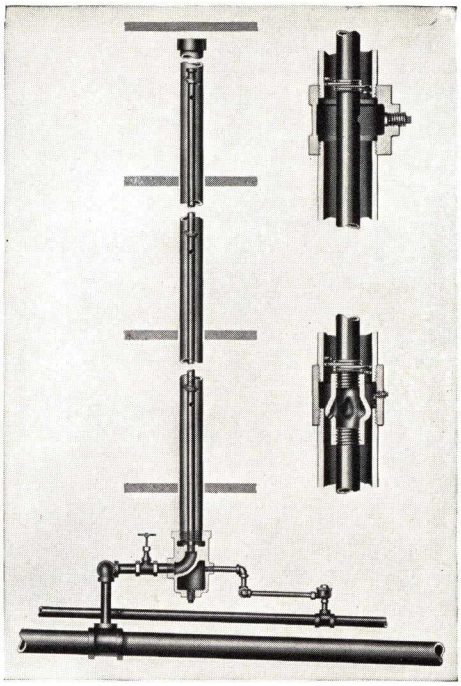


Fig. 29. Webster Inner-Tube Heating Risers (Patented)

Are used in place of ordinary heating risers for bathrooms, kitchens and small rooms of apartments, dormitories, etc. in conjunction with Improved Webster Systems and Webster Central Controls, reducing installation cost without sacrificing operating economy or comfort. Two concentric pipes are installed with a Webster Heating Riser fitting at base of up-feed or top of down-feed riser. Centering springs are installed to properly locate inner pipe. The properly-sized metering orifice openings are drilled into inner pipe at each floor level. Riser heating is thus controlled by fractional filling exactly as with orificed radiators in Webster centrally-controlled systems. Only a small portion of riser surface will be heated in mild weather, larger portion as outdoor temperature becomes lower.

Webster Double Service Valve

Combines thermostatic trap with quick-opening valve. Simplifies piping in down-feed risers in one-story buildings. Acts as trap for down-feed riser and as a radiator supply valve. Metering orifices can be furnished when used with Improved Webster Systems. Wheel handle is standard; lever and lockshield types available on special order. For Ratings see Tables XI and XII. A separate bulletin giving further details of the Webster Double Service Valve is available to supplement the brief description here. Ask for Bulletin 722-C.

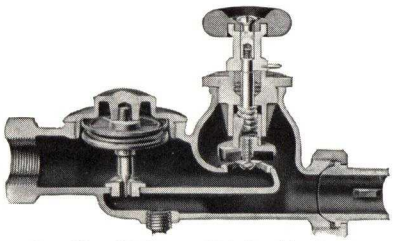


Fig. 30. Webster 174 Double Service Valve

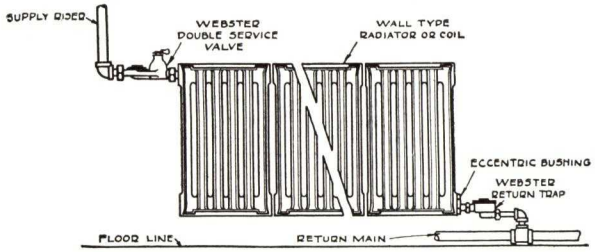
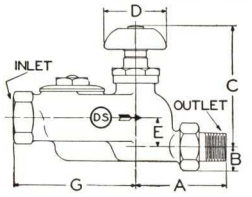


Fig. 31. Application of Webster Double Service Valve

TABLE XIII. Dimensions of Double Service Valves



Size	Symbol	A	B	C	D	E	G
3/4"	173	3 1/4	7/8	4 3/8	2 1/4	1	4 3/8
1"	174	3 3/4	1 1/4	5 3/16	2 3/8	1	5 3/4
1 1/4"	175	4 1/16	1 7/16	5 7/8	2 3/8	15/16	6 3/8
1 1/2"	176	4 1/2	1 9/16	5 7/8	2 3/8	1	6 1/8

All dimensions in inches and subject to slight variation.

TABLE XIV. Rated Capacities of Webster Low Pressure Traps

(For press. difference across trap in lb. per sq. in.) select trap by rating, not by pipe size. For Improved Webster Systems using metering orifices, it is recommended that the selection of traps be based on 1/4 lb. per sq. in. press. difference.

Size	Symbol	Press. diff. in lb. per sq. in.									
		1/10	1/4	1/2	1	1 1/2	2	5	10	15	25
Sylphon and Series "7" Traps in Sq. Ft. E.D.R.											
1/2"	502 and 702	55	85	120	165	200	235	370	530	640	....
3/4"	503 and 703	55	85	120	165	200	235	370	530	640	....
1/2"	512 and 712	105	165	230	330	400	465	730	1050	1300	....
3/4"	513 and 713	105	165	230	330	400	465	730	1050	1300	....
3/4"	523 and 723	185	290	410	580	700	810	1280	1840	2300	....
1"	534 and 734	315	500	710	1005	1200	1420	2270	3110	3900	....
Series "7-M" Traps in Sq. Ft. E.D.R.											
1/2"	702-M	55	85	120	165	200	235	370	530	640	840
3/4"	703-M	55	85	120	165	200	235	370	530	640	840
1/2"	712-M	105	165	230	330	400	465	730	1050	1300	1640
3/4"	713-M	105	165	230	330	400	465	730	1050	1300	1640
3/4"	723-M	185	290	410	580	700	810	1280	1840	2300	2900
1"	734-M	315	500	710	1005	1200	1420	2270	3110	3900	5070

In above table ratings are given Equivalent Direct Radiation (E.D.R.) based on 240 B.T.U. per sq. ft. per hour.

Series 26 Heavy Duty Drip Traps in Lbs. Water per Hour

3/4"	00026-T and O	50	75	100	145	170	200	285	370	430	....
1"	0026-T and O	160	250	350	500	600	700	1000	1300	1500	....
1 1/4"	026-T and O	330	510	660	920	1030	1200	1500	1850	2250	....
1 1/2"	126-T and O	540	840	1200	1720	2060	2400	3800	5400	6700	....
2"	226-T and O	1080	1720	2450	3500	4300	5000	7800	11100	13600	....

No allowance made for pressure drop in the connecting piping between radiation and trap or from trap through run-out to return.
CONVERSION FACTORS: To convert ratings given in lb. per hour of water to sq. ft. E.D.R. at 240 B.T.U., multiply by 4. To convert ratings given in sq. ft. E.D.R. at 240 B.T.U. to lb. per hour of water, divide by 4.

Webster Traps

A number of different types of low pressure traps are provided for use in Webster Systems to discharge condensation and air from radiators, drips, unit heaters, blast radiation, etc., giving a choice to meet every operating condition.

Webster Sylphon Trap

Original and highly perfected type of low pressure thermostatic bellows trap. Effectively discharges all condensation and entrained air from radiators or coils without permitting passage of steam. Operation is by means of a liquid contained in the rugged Sylphon Bellows. Stainless steel cone valve and renewable sharp-edged stainless steel seat. Factory adjusted, and made in ½, ¾ and 1 in. sizes. Maximum pressure 25 lb. per sq. in. For normal operating pressures not exceeding 15 lb. per sq. in. *See Table XIV for ratings.*

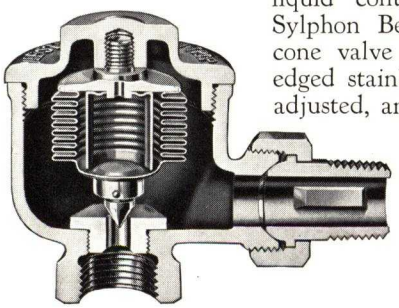
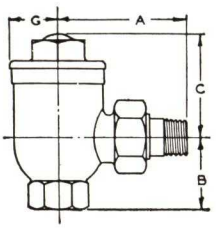


Fig. 32. Webster 502 Sylphon Trap

TABLE XV. Dimensions of Webster Sylphon Traps

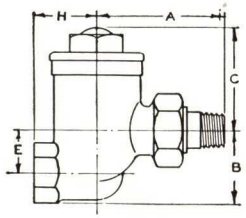
Angle Bodies (Symbol H)



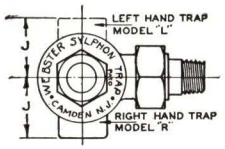
Size	A	B	C	G
½"—502	2¾	1⅛	1 15/16	1 3/16
*½"—502HS	2¾	1 5/16	1 15/16	1 3/16
½"—512	3⅛	1⅝	2 3/8	1⅛
¾"—503	3 3/16	1 9/16	1 15/16	1 3/16
¾"—513	3 1/16	1¾	2 3/8	1⅛
¾"—523	3 5/16	1⅞	3 9/16	1 5/16
1" —534	4	2 5/8	3 3/16	1¾

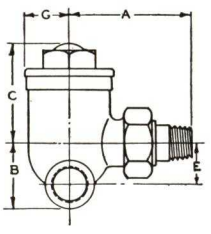
All dimensions in inches and subject to slight variation.
*Has ¾-in. outlet.

Right-corner (R), Left-corner (L) and Straightway (G) Bodies



All dimensions in inches and subject to slight variation.





Size	A	B	C	E	G	H	J
½"—702	2¾	1 1/16	1 13/16	¾	1 3/16	1 13/16	1⅝
†½"—702S	2¾	1 1/16	1 13/16	¾	1 3/16	1 13/16	1⅝
½"—712	3 5/16	1 7/16	1 9/16	¾	1⅝	2 1/8	2 1/8
¾"—703*	3 3/16	1⅝	1⅞	⅞	1⅛	1 13/16	...
¾"—723*	3 13/16	1¾	2 1/16	1 3/16	1⅞	2¼	...

*Made in straightway (G) body only. †Has ¾-in. outlet.

Webster Series "7" Return Trap—A perfected diaphragm-type thermostatic trap unusually strong in construction. A notable record of trouble-free service (over 1,700,000 installed) has led to its adoption by hundreds of architects and engineers. Uses as operating member a triple-sealed, phosphor bronze diaphragm. Important feature is stainless steel cone valve and renewable sharp-edged stainless steel seat. Each trap is individually adjusted and tested at factory. Made in ½, ¾ and 1 in. sizes. Maximum pressure —25 lb. per sq. in. For normal operating pressures not exceeding 15 lb. per sq. in. *See table XIV for ratings.*

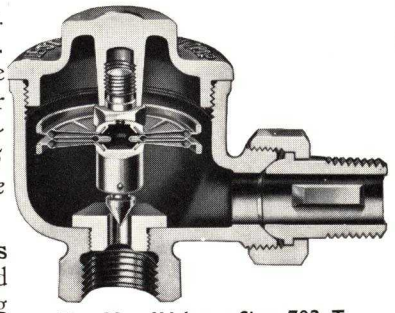
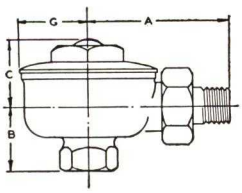


Fig. 33. Webster Size 702 Trap

Webster Series "7-M" Trap—Used where normal operating pressures will prevail up to 25 lb. per sq. in. Maximum occasional pressure is 50 lb. per sq. in. The series "7-M" Trap is similar to the Standard Series "7" Type but has been still further reinforced to meet the higher pressures by heavy gauge monel metal diaphragm as well as stainless steel cone valve piece and seat insert. *See Table XIV for ratings.*

TABLE XVI. Dimensions of Webster Series "7" and "7-M" Traps

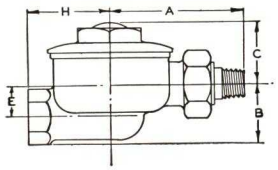
Angle Bodies (Symbol H)



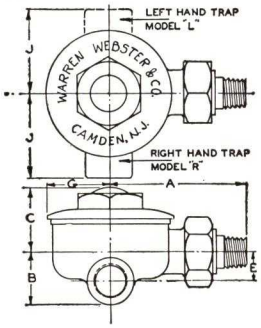
Size	A	B	C	G
½"—702	2¾	1⅛	1 13/16	1 3/16
*½"—702HS	2¾	1 5/16	1 13/16	1 3/16
½"—712	3 5/16	1 7/16	1 9/16	1⅝
¾"—703	3 3/16	1 9/16	1 13/16	1 3/16
¾"—713	3⅝	1 7/16	1⅝	1⅝
¾"—723	3 13/16	1⅝	2 1/16	1⅞
1" —734	4 9/16	2	2 5/16	2⅛

All dimensions in inches and subject to slight variation.
*Has ¾-in. outlet.

Right-corner (R), Left-corner (L) and Straightway (G) Bodies



All dimensions in inches and subject to slight variation.



Size	A	B	C	E	G	H	J
½"—702	2¾	1 1/16	1 13/16	¾	1 3/16	1 13/16	1⅝
†½"—702S	2¾	1 1/16	1 13/16	¾	1 3/16	1 13/16	1⅝
½"—712	3 5/16	1 7/16	1 9/16	¾	1⅝	2 1/8	2 1/8
¾"—703*	3 3/16	1⅝	1⅞	⅞	1⅛	1 13/16	...
¾"—723*	3 13/16	1¾	2 1/16	1 3/16	1⅞	2¼	...

*Made in straightway (G) body only. †Has ¾-in. outlet.

Webster Series 26 Heavy Duty Drip Traps

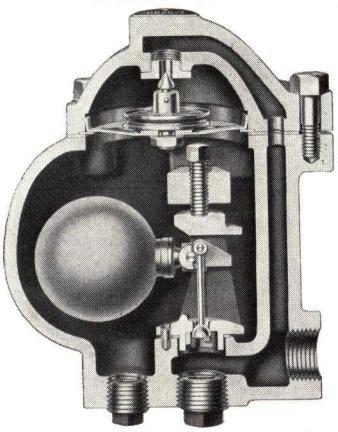


Fig. 34. Webster Size 0026-T Heavy Duty Drip Trap

Series 26-T — Heavy duty traps, capable of handling large volumes of condensation and air, and at the same time compact and light in weight. Suited for drips of mains, blast radiation, unit heaters, hot water generators, fan heater coils, and similar applications. The specification calling for a heavy duty, float-type trap is fully met, while the advantages of the thermostatic element and ease of installation are both re-

tained. Side outlet opening of ample size permits the discharge of water, or water and air. In the bottom of the trap are plugged clean-out openings. The most used sizes (00026, 0026, 026) incorporate the *outward opening* seat feature.

A choice of two inlet openings in opposite sides of body and two outlet openings at bottom is provided in sizes 0026 and 026. Size 00026 has one inlet opening and one outlet on cover plate. Light in weight, so that it may be handled easily and mounted in pipe line without other support. Sizes 126 and 226 have single end inlets and outlets. These larger sizes require a supporting bracket when installed. Maximum working pressure, 15 lb. per sq. in. *See table XIV for ratings.*

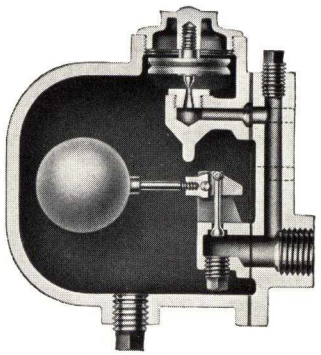


Fig. 35. Webster Heavy Duty Drip Trap, Size 00026-T

Series 26-O—Similar to the Model 26-T Drip Trap but without thermostatic element. Used where concentration of air does not occur, such as on ends of mains and risers, flash tanks and dripping gravity heating systems into vacuum return lines. Provision is made for external air by-pass.

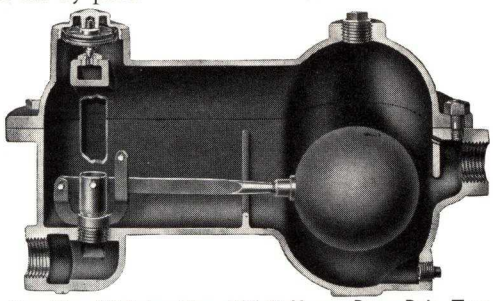
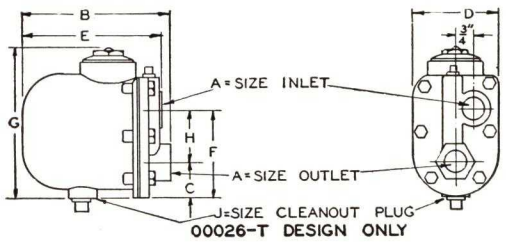
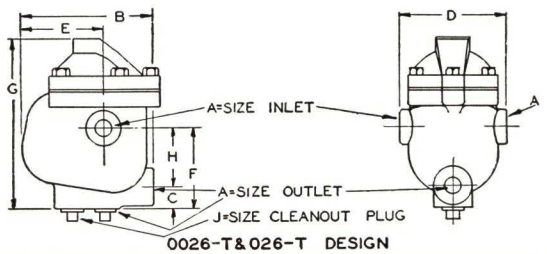


Fig. 36. Webster Size 126-T Heavy Duty Drip Trap

TABLE XVII. Roughing-in Dimensions of Webster Series 26 Heavy Duty Drip Traps





Symbol	A	B	C	D	E	F	G	H	J
00026-T 00026-O	3/4 3/4	6 5/8 6 5/8	1 1/2 1 1/2	3 3/4 3 3/4	6 1/8 6 1/8	3 7/8 3 7/8	6 5/8 6 5/8	2 3/8 2 3/8	1/2 1/2
0026-T 0026-O	1 1	6 3/8 6 3/8	1 1/8 1 1/8	4 1/2 4 1/2	3 15/16 3 15/16	3 15/16 3 15/16	8 1/8 7 1/16	2 13/16 2 13/16	1 1
026-T 026-O	1 1/4 1 1/4	8 1/8 8 1/8	2 1/2 2 1/2	5 1/8 5 1/8	4 7/8 4 7/8	5 5/8 5 5/8	9 13/16 8 7/16	3 1/8 3 1/8	1 1/4 1 1/4

All dimensions in inches. Subject to slight variation.

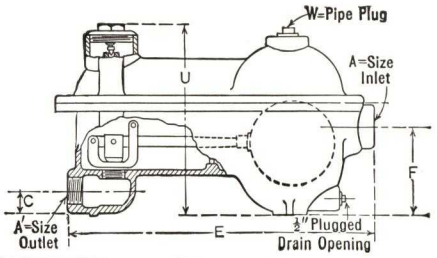


TABLE XVIII. Dimensions of Webster Heavy Duty Traps, Sizes 126 and 226

Symbol	A-A[1]	C	E	F	U	W
126-T 126-O	1 1/2 1 1/2	1 3/8 1 3/8	15 15	4 5/8 4 5/8	10 1/2 9	1 1
226-T 226-O	2 2	1 5/8 1 5/8	18 3/8 18 3/8	5 1/2 5 1/2	12 11 3/8	1 1/4 1 1/4

All dimensions in inches and subject to slight variation.

Webster Dirt Strainers and Pockets

Placed in return lines of steam heating systems to catch dirt, rust, scale and other particles, preventing them from impairing the tightness of traps. More dependable than pockets made of pipe and fittings, cost less to install, and are more readily cleaned.

Where the probability of dirt is greater than normal, Series 18 Dirt Strainers should be used in place of Series 26 Dirt Pockets.

Fig. 37 Size 526 Dirt Pocket

Fig. 38. Size 782 Dirt Strainer

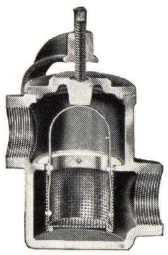
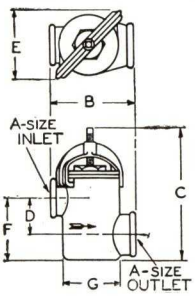
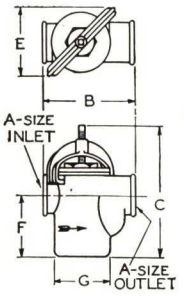


Fig. 39. Size 118-A Dirt Strainer

Maximum working pressure, 15 lb. per sq. in., except Series "78," which is 125 lb. per sq. in.



Type A—Offset



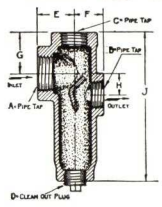
Type B—Straightway

TABLE XIX. Dimensions of Webster Series 18 Dirt Strainers

Symbol	A	B	C	D	E	F	G
018-A	1/2 or 3/4	3 1/2	6	1 3/4	2 3/4	2 3/4	2 1/2
118-A	1 or 1 1/4	4 3/4	7 5/16	2	3 1/2	3 1/2	3 1/4
218-A	1 1/2 or 2	6	9 3/16	3	4 3/4	4 3/4	4 1/4
018-B	1/2 or 3/4	4 1/4	6	.....	2 3/4	2 3/4	2 1/2
118-B	1 or 1 1/4	5 1/2	7 5/16	.....	3 1/2	3 1/2	3 1/4
218-B	1 1/2 or 2	7 1/4	9 3/16	.....	4 3/4	4 3/4	4 1/4

All dimensions in inches and subject to slight variation.

TABLE XX. Dimensions of Webster Series "26" Dirt Pockets

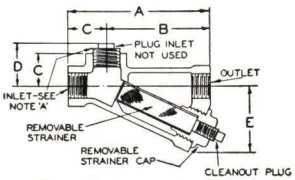


Symbol	A	B	C	D	E	F	G	H	J
526	1 1/4	1	1	3/4	1 3/4	1 3/8	1 7/8	1	6 7/8
826	2	1 1/4	1 1/4	1	2 1/8	1 5/8	2 5/16	1 1/2	7 7/8
1026	2 1/2	1 1/4	1 1/2	1 1/4	2 5/8	1 3/4	2 3/4	1 5/8	9 1/4
1226	3	1 1/4	1 1/2	1 1/4	2 3/4	1 3/4	3 1/16	1 7/8	10 5/8

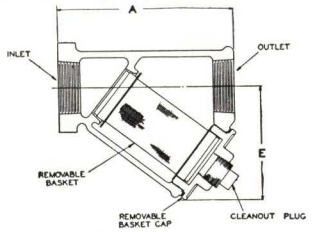
All dimensions in inches and subject to slight variation.

TABLE XXI. Dimensions of Webster Series "78" Dirt Strainers

Maximum working pressure 125 lbs. per sq. in.



Sizes ½ in. to 1 in. incl.



Sizes 1¼ in. to 2 in. incl.

Symbol	Tappings		Dimensions				
	Inlet	Outlet	A	B	C	D	E
782	½	½	4½	3⅜	1⅛	1½	2¼
*782-B	½	½	4½	3⅜	1⅛	1 11/16	2 3/16
783 and 783-B	¾	¾	4 13/16	3½	1 5/16	1 13/16	2¾
784 and 784-B	1	1	5 9/16	4⅛	1 7/16	2 1/16	3 1/16
785 and 785-B	1¼	1¼	5½	Provided on straight run only.			3 11/16
786 and 786-B	1½	1½	6¼				4 1/16
788 and 788-B	2	2	7⅛				4⅝

*Available also with ⅜ in. inlet and outlet.

B Models have cast brass body, nickel-plated all over, polished trim. Other models have painted cast-iron bodies.

Webster Traps for "Process Steam"

Series "78"—A Thermostatic trap used to discharge air and water from heating coils and any apparatus using steam at process pressures, i. e., 10 to 125 lb. per sq. in. Built in four sizes: ⅜, ½, ¾ and 1 in. There are two classes: Class 2 for pressures of 10 to 60 lb. and Class 3 for pressure of 60 to 125 lb. Steam brass body and cover. Nickel plated with polished trim. Monel metal diaphragm. Stainless steel valve piece and seat insert.

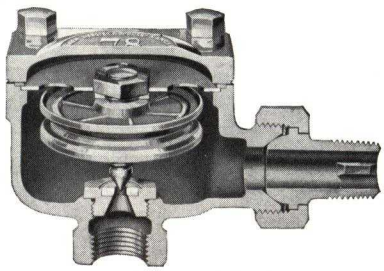
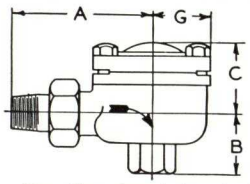


Fig. 40. Webster Size 782 Trap

TABLE XXII. Dimensions of Webster Series "78" Traps



No. of trap	Inlet	Outlet	A	B	C	G
780†	⅜	⅜	†2 11/16	1 3/16	1 13/16	1¼
782*	½	½	*3 9/16	1 7/16	1 15/16	1 5/8
783	¾	¾	3 13/16	1 7/16	2 3/8	1 13/16
784	1	1	4½	2	2 7/16	2 3/8

All dimensions in inches and subject to slight variation.

†780 Trap furnished with ⅜-in. female nipple on special order. Dimension A = 2¾ in.

*782 Trap furnished on special order with ⅜-in. male nipple, also ⅜-in. or ¼-in. female nipple to fit standard ½-in. union nut. Dimension A = 3⅜ in.

NOTE—780 Trap has screwed cap; other sizes, bolted cap.

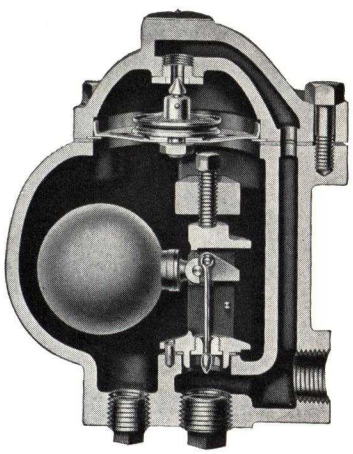


Fig. 41. Webster 794-T Trap

Series "79" — Float-and-thermostatic traps designed for normal working pressures between 15 and 125 lb. per sq. in. For use where large volumes of very hot condensate must be handled more quickly than is possible by thermostatic traps alone. Condensate is passed through float-controlled outward opening valve while air is discharged into return piping through thermostatic vent and integral bypass. Compact and light and readily mounted in a pipe line without other support.

Cast iron body, copper-asbestos gasket, and cover are bolted together with steel cap screws. Valve piece and stem are Monel Metal while seat is Stainless Steel. Air vent unit is thermostatic element of Webster 780 Trap.

Made in four pressure classifications as shown in Table XXIV, the only difference being in the size of the float-controlled valve seat opening. Model 794-O without thermostatic vent is available.

Roughing-in dimensions same as Size 0026-T Trap in Table XVII. Available with either ¾ in. or 1 in. inlet and outlet.

TABLE XXIII. Rated Capacities of Webster Series "78" Traps*

Size of trap	Pressure differential, lb. per sq. in.										
	1	5	10	20	30	40	50	60	80	100	125
	Lb. water per hour										
Class 2—Working pressures up to 60 lb. per sq. in.											
⅜"—780	6	20	33	53	70	88	100	120	145	170	200
½"—782	14	40	64	100	130	158	180	205	245	283	330
¾"—783	31	90	142	225	290	350	400	460	550	640	740
1" —784	70	200	315	490	640	770	900	1000	1204	1400	1620
Class 3—Working pressures up to 125 lb. per sq. in.											
⅜"—780	4	13	22	36	48	60	70	80	99	115	135
½"—782	11	32	51	80	105	128	148	165	200	230	270
¾"—783	25	72	112	178	230	280	325	360	440	500	580
1" —784	56	162	255	402	530	640	730	830	1000	1170	1350

*Pressure differentials given in this table refer to pressure at inlet of trap and in return line. Select trap to handle maximum condition. For normal working pressures up to 60 lb. per sq. in., use Class 2 Traps even though occasional pressures may go above 60 lb. For normal pressures between 60 lb. and 125 lb., use Class 3 Traps. In this table ratings are given *above* 60 lb. for Class 2 Traps and *below* 60 lb. for Class 3 Traps merely to show performance at these special pressures.

TABLE XXIV. Rated Capacities of Webster Series "79" Traps in Lb. Water per Hour

Symbol	Pressure differential in lb. per sq. in.											
	1	5	15	25	30	40	50	60	80	90	100	125
Class 2A—Working pressures 15 to 30 lb. per sq. in.												
794-T-2A	460	1030	1790	2280	2540							
Class 2B—Working pressures 30 to 60 lb. per sq. in.												
794-T-2B	260	590	1020	1270	1440	1660	1860	2020				
Class 3A—Working pressures 60 to 90 lb. per sq. in.												
794-T-3A	130	290	510	650	720	840	940	1020	1200	1260		
Class 3B—Working pressures 90 to 125 lb. per sq. in.												
794-T-3B	68	150	260	350	370	450	500	520	640	660	700	759

Important Note—A very complete engineering data book on process steam application and use of Webster Series "78" and "79" Traps is available to supplement the brief description above. Write for Webster Bulletin B-1200C.

Webster Series 23-A Heavy Duty Traps

For use at steam pressures up to 50 lb. per sq. in. Float-type heavy duty trap for large quantities of condensate. Does not include integral air vent. Air may be vented by petcock, or through a Webster 780 Class 2 Trap located in an external by-pass. Available in 1, 1½ and 2-inch sizes.

Webster Vacuum Pump Governor

Used to govern flow of steam to steam-driven vacuum pumps. Maintains a constant degree of vacuum in return mains and prevents pump from racing, if vacuum in return mains should be lost. Has cast iron frame and body. Rubber composition diaphragm. Steel spring. Brass body, double seated valve.

Standard valve furnished for pressures up to 150 lb. per sq. in. Special valve available for pressures over 150 lb. and under 200 lb. or for superheat. Valves range in size from ¾ inch to 3½ inches inclusive. **Write for Bulletin B-708B.**

Webster Suction Strainers

Installed ahead of vacuum pump to prevent dirt and scale, brought down with condensation from heating system, from damaging pump with resultant troubles.

A tapping is provided for introduction of cold water make-up when that is desired; another for connection to a vacuum gauge. Made of heavy cast iron with flanged connections. Companion flanges included as standard. Clean-out cover is bolted on with rubber gasket joint. Screen basket is made of sheet brass with No. 4 holes (.045 in. dia.), 225 holes per sq. in. and is easily removable for cleaning. Maximum working pressure, 15 lb. per sq. in. **Write for Bulletin B-709B.**

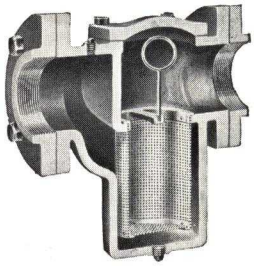


Fig. 42. Webster Suction Strainer

Webster Type "Y" Strainer

For use on water lines to remove sediment, hair, leaves, etc., and thus protect pumps and other machinery. Used extensively for swimming pools and supply lines of railroad water tanks. Exact duplicate of Suction Strainer except screen basket which is of heavier material and has No. 11 holes (0.1 in. dia.) and 49 holes per sq. in. **Write for Bulletin B-709B.**

Webster Lift Fittings

The improved design of Webster Lift Fittings makes possible quicker starting of the lift and retains all the advantages of the earlier design.

Used in pairs where condensation is to be lifted to a higher level. More efficient than "lifting pockets" made of standard fittings; require less time, and cost less to install.

Sizes ¾ to 8 in. Made of cast iron. Maximum working pressures 15 lb. per sq. in. or 29 in. of vacuum. **Write for Bulletin B-713C.**

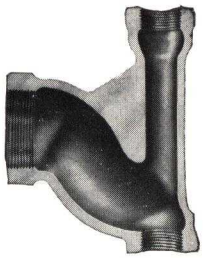


Fig. 43. Webster Lift Fitting

Webster Air Separating and Receiving Tanks

Used with Webster Vacuum Systems for storage of condensate discharged by the vacuum pump and for liberation of air that comes over with this condensate. For working pressures up to 30 lb. per sq. in. Tanks available in three sizes handling up to 32,000 lb. water per hour. Standard cylindrical shell of steel plate with flat flanged heads. Electro-welded throughout. Connections are steel pipe sockets welded in place. Four types: plain, water-control, steam-control, and hydro-pneumatic. **Write for Bulletin B-714B.**

Webster System Gauges

Compound steam gauges employing the Bourdon tube principle. Accuracy in the range of operating pressure (10 in. vacuum to 5 lb. pressure) assured by a patented retard design. Dial is graduated to read from 30 in. vacuum to 30 lb. pressure with 1 oz. intervals from 0 to 5 lb. and ½ in. intervals from 0 to 10 in. vacuum.

Enclosed in steel case finished in crystal black. Nickel plated flared ring surrounding dial. Zero adjustment accomplished by slotted screw on the dial face. Internal siphon eliminates unsightly exposed siphon and protects Bourdon tube from steam temperatures.

Furnished in two sizes: a 3½ in. dial with ⅛ in. male bottom connection and a 5 in. dial with ¼ in. male bottom connection. Non-retard type gauge furnished in 5 in. size when desired. **Write for Bulletin B-730.**

Webster Hylo Controller

Individual buildings of a group or individual sections of a building served by a single source of vacuum may require different degrees of vacuum for proper steam circulation. Use of Webster Hylo Controllers and related equipment provides means to maintain different yet constant degrees of vacuum at various points throughout the heating system. Once adjusted it is not necessary to change the Controller as it automatically maintains proper circulation. Write for further information.

Webster Water Accumulators

Placed in pipe line connecting diaphragm of pressure reducing valve to steam main. Provide a large volume of water between diaphragm and main to (1) prevent damage to diaphragm because of high temperatures and (2) assure a practically constant static head of water which eliminates fluctuations in static pressure.

Made of cast iron in two sizes. Maximum working pressure 15 lb.

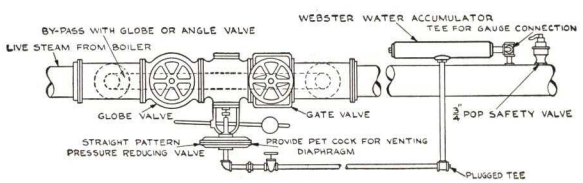
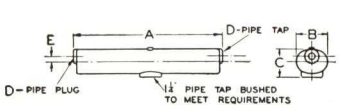


Fig. 44. Method of Installing Straight Pattern Pressure Reducing Valve Using Webster Water Accumulator

TABLE XXV. Dimensions of Webster Water Accumulators



Symbol	A	B	C	D	E
235	18¾	4	3½	¾	⅝
236	21¼	7½	4⅜	1¼	13/16

All dimensions in inches and subject to slight variation.

Webster Expansion Joints

Webster Expansion Joints are constructed with cast iron bodies and brass slip sleeves, and in both single and double slip types. The bodies of Webster Expansion Joints are provided with anchors integral with the body castings. Service connections are provided for convenience in tapping the steam main for branch piping. Drip outlets are also provided.

Made in three classes: (1) For working pressure of 15 lb. per sq. in.; (2) for 125 lb. per sq. in.; (3) for 150 lb. per sq. in.

Sizes range from 1½ to 20 in., according to class.

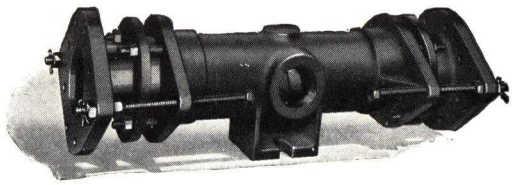


Fig. 45. Webster Expansion Joint

Webster Steam Separators

Remove excess condensation from live steam lines and thus protect engines, turbines, pumps, compressors, and other steam-driven apparatus from damage due to this excess water. Made in both horizontal and vertical types. Vertical type especially used as a receiver at engine throttle to absorb pulsations in steam flow. Horizontal type effective in removing water from compressed air lines.

Made as one-piece iron casting for maximum pressure of 200 lb. per sq. in. Sizes from 1½ in. to 12 in. inclusive.

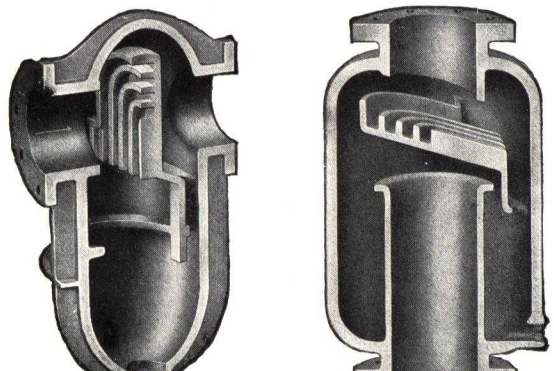


Fig. 46. Webster Steam Separators. Horizontal Type at Left, Vertical Type at Right

Webster Oil Separators

Placed in exhaust steam lines to remove cylinder oil from steam before latter is condensed and used for boiler feed, or for direct heating of water.

Body and cover are cast iron. Steel baffles of the double-hook, multi-baffle type. Entire interior is removable through handhole for cleaning and inspection.

Horizontal type made in sizes 1½ in. to 16 in. inclusive; Vertical type in sizes 3 in. to 10 in. inclusive. Maximum working pressure, 15 lb. per sq. in.

At right.

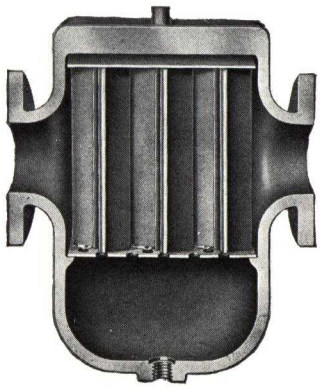


Fig. 47. Webster Oil Separator Horizontal Type

WEBSTER TYPE R SYSTEM EQUIPMENT

Service Bulletin S-650D giving complete mechanical details of the Webster Type "R" System is available to supplement the brief description on this page. Popular "Don Graf" Data Sheets are also available for those desiring information in that form.

Quick circulation, despite variations in boiler pressures, is assured in Webster Type "R" Systems through the combination of the Webster Boiler Return Trap and Vent Trap. Air escapes from the system through the Webster Vent Valve. Water returns direct to the boiler by gravity at low pressures. An increase of pressure causes the Webster Boiler Return Trap to fill and operate, equalizing the pressure and making positive the prompt return of water to the boiler. Units are made to provide five sizes of the Webster Boiler Return Trap and Vent Trap combination, having the range of capacities given in Table XXVI.

Each Type "R" Combination should include a Webster Series 78 Dirt Strainer and (2) Webster 45° Check Valves.

Webster Boiler Return Trap

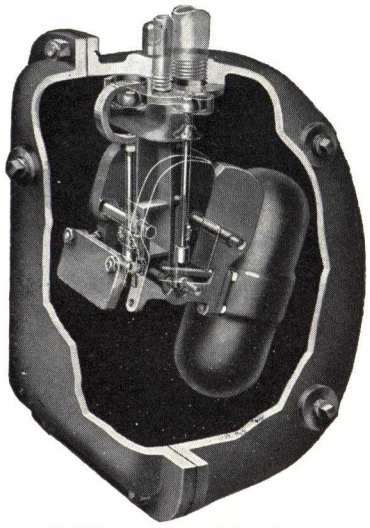


Fig. 48. Webster Size 023 Boiler Return Trap

Positive acting, reciprocating device for returning water to boilers in Webster Type "R" Systems. Construction is shown in Fig. 48. The float is of heavy gauge metal with no exposed seams. The entire mechanism is held in place by two studs and is removable as a unit. It turns on a single Monel Metal shaft. Steam valve opens quickly when high level is reached. No wire drawing. Valves are all-metal and self-aligning. Operation is silenced by stainless steel bumper springs.

Webster Vent Trap with Vent Valve

Used in conjunction with the Webster Boiler Return Trap, to provide a dependable method of removing air from heating systems and automatically preventing its return, at the same time making overflow of condensation impossible.

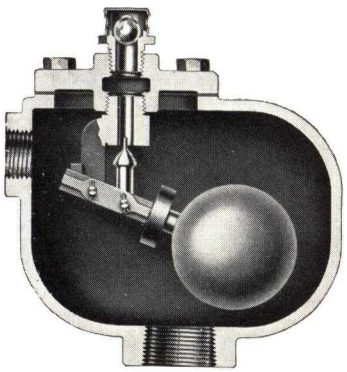


Fig. 49. Webster Size 123A Vent Trap with Separate Vent Valve. Sizes 223A and 323A Are Similar

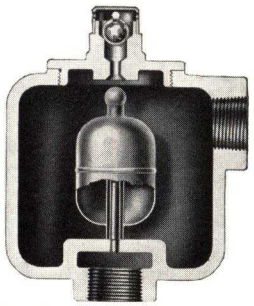


Fig. 50. Webster 0023A Vent Trap with Integral Vent Valve

Webster Damper Regulator

Controls and maintains pressure of only a few ounces. Used with hand-fired, anthracite coal-burning low pressure boilers in Webster Vacuum and Type "R" Systems when normal operation is from 2 ounces to a maximum pressure of 2 lb. per sq. in. at boiler. Applicable in stoker-fired installations *only in exceptional cases* when damper regulation controls air supply damper; with oil-burners *only when throttling type burner is used.*

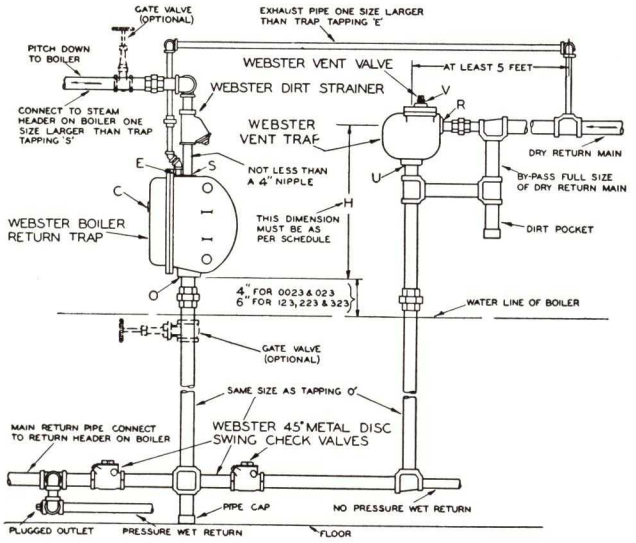


Fig. 51. Conventional Arrangement of Webster Type "R" System Equipment. Gate Valves Are Optional

TABLE XXVI. Data and Ratings for Webster Type "R" System Basement Equipment (Refer to Fig. 51)

Rating sq. ft. dir. rad.	Size Boiler Return Trap	Tappings E	Tappings O	Tappings S	Size Vent Trap	Number of ½-in. Vent Valves	Tappings R	Tappings U	Tappings V	Dimension H	Size Dirt Strainer	Size Check Valves (2 Req'd)
0- 1500	0023	½	1¼	¾	0023A	†	1	1		14	783	1¼
1501- 2500	023	½	1½	1¼	123A	1	1¼	1½*	½	17	785	1½
2501- 4000	123	½	2	1¼	123A	1	1¼	2	½	19	785	2
4001- 8000	223	¾	2½	1½	223A	2	1¼	2½	¾	23	786	2½
8001-16000	323	¾	3	1½	323A	3	1¼	2½	1	26	786	3

*Bushed—2"x1½". †Integral Vent Valve.

All dimensions in inches and subject to slight variation.

Webster Boiler Protector

Provided to prevent breakage in low pressure cast iron boilers when the water level becomes inadequate. Automatically feeds to boiler when water level drops to 1 in. above bottom of gauge glass. Body is made of cast iron with three principal parts bolted together. Interior parts of copper, brass or Monel Metal to withstand corrosion. Seamless float actuates Monel Metal cone pilot valve on sharp-edged Monel Metal seat. Water valve with special Jenkins composition disc actuated by difference in water pressure between exterior and interior of Syphon Bellows.

Adapted to almost all types of low pressure heating boilers where maximum pressure will not exceed 15 lbs. per sq. in. Maximum cold water main pressure should not exceed 150 lb. per sq. in.; minimum must not be less than 25 lb. per sq. in.

Made in one size, Model 34 with ¾-in. connections. Also Model 34C-1 with electrical cut-out switch.

Catalog B-727B and instruction bulletin available on Webster Boiler Protection.

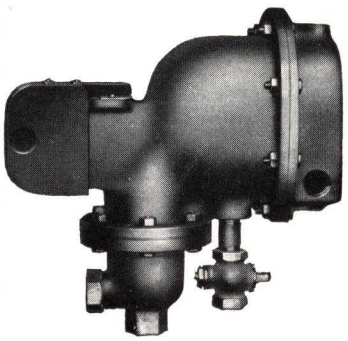


Fig. 52. Model 34C-1 Webster Boiler Protector, with Electrical Cut-out Switch

26
45

WEBSTER SYSTEM RADIATION
Concealed Non-Ferrous Type

A complete catalog is available to supplement the brief description shown here. It includes complete descriptive information, illustrations, details on results in installations, complete dimension data and certified rated capacities. Ask for Bulletin B-1500B.

Webster System Radiation is designed for use exclusively with Improved Webster Systems of Steam Heating. It cannot be used for hot water heating or one-pipe vapor or steam systems. Webster System Radiation is a logical development of the experience gained by Webster engineers in their work of assuring proper application and utilization of Webster System Equipment with many different types of radiation.

Webster System Radiation is far more than just another type of light-weight radiation. It combines *in a single unit,* a light-weight heating element of high efficiency with an orificed radiator supply valve, a radiator trap, and supply and return piping connections. This unit is entirely concealed by an accompanying metal enclosure which is furnished with the unit for installation within the wall. This unique combination of elements not only reduces the space requirements to a minimum but greatly simplifies installation and, in addition, places the responsibility for the correct functioning of all of these closely related items in the hands of one well-established manufacturer.

Webster System Radiation and enclosures are so designed that the entire heating element can be readily removed without damage to plaster or other structural materials.

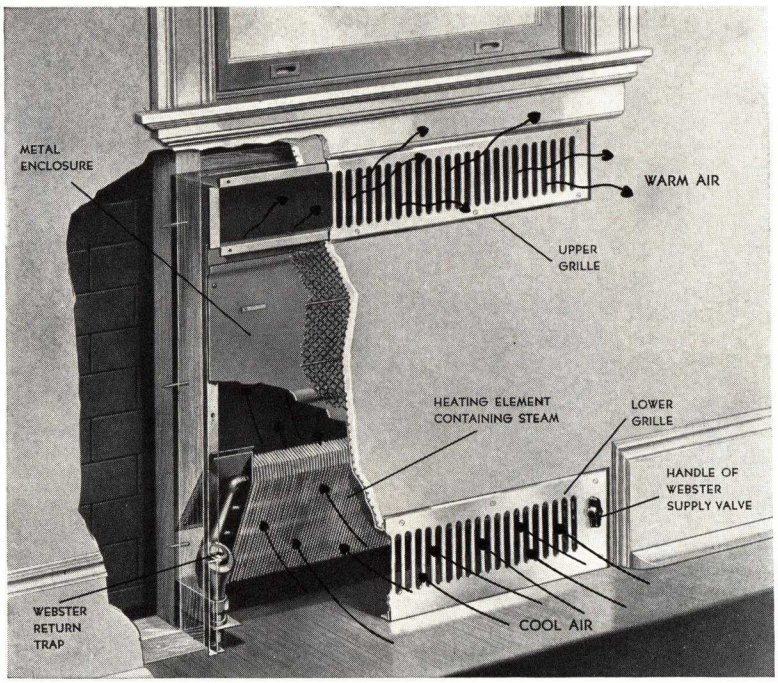


Fig. 53. How Webster System Radiation Heats the Room by Natural Circulation
Air from room is drawn in through lower grille and passes upward over heating element. As its temperature is raised air ascends and re-enters room through upper grille. As warm air gives up its heat by contact with objects in room and by mixture with cooler air, its temperature drops and it falls to floor level where it re-enters lower grille. Note supply valve handle outside lower grille, enabling room occupant to turn on or completely shut off heat
(*Type AK Radiator Illustrated*)

Description

Enclosures are of heavy gauge, cold rolled (furniture) steel finished in baked prime coat. Provided with holes for nailing to studding. May be installed back of any wall surface. No special framing or furring required. Length of enclosure is total length of recess—unnecessary to add for valve and trap connections. Fixed support for heating element integral with enclosure eliminates necessity for adjustment or legs.

Heating Element—Entirely non-corrosive materials. Designed for complete drainage. Flat surfaced fins prevent lodging of dust and dirt. Element installed on an angle to provide maximum heat per unit of space occupied. Tubes and headers connected by Mueller Streamline Joints.

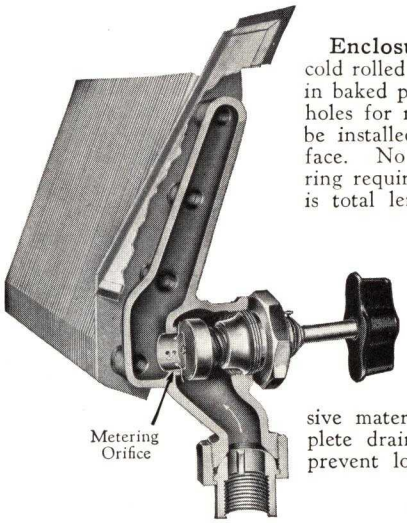


Fig. 54. Cut-away View of Supply Header
Showing Webster "Three-Point" Valve including metering orifice

Webster Three-Point Supply Valve with Sleeve-Type Metering Orifice incorporated in each unit. For detailed description of these features see pages 2 and 8.

Union Connections—For both steam and return are furnished as part of the radiator. Units furnished left-hand or right-hand *but not convertible.*

Metal Grilles—Of pleasing bar type design.

Webster Trap—Built into return header. Phosphor bronze diaphragm, removable sharp-edged seat, 60° cone valve piece.

Ease of Installation—The combination of supply valve, heating element and return trap in a single unit eliminates considerable roughing-in work, simplifies piping and reduces installation labor cost.

Enclosures

The requirements of widely varied architectural treatments and building construction are met without preparation of special architectural detailed drawings by one of the following types of Webster System Radiation:

(1) *Type AK*—For concealing within plaster, panel, tile, marble, stone, and other surfaced walls.

(2) *Type AKT* — Similar to Type AK Enclosure except having a No. 12 gauge, ¾ in. square mesh, horizontally positioned top outlet grille.

(3) *Type AM*—Metal cabinet for enclosing within wall but having metal panel cover.

(4) *Type AE* — Free standing exposed cabinet.

(5) *Type AEH* — Hung type exposed cabinet.

Other types such as special institutional enclosures are available. Information upon request.

Provision has been made in all types of enclosures for positive control of heat by extending Webster Supply Valve handle through lower grille or opening. The handle is of pleasing shape and has been placed in an inconspicuous location yet is easily operable if room occupant desires to turn on or shut off heat.

Fig. 55. Cut-away View of Return Header
Complete drainage from all tubes provided for by raceways around valve seat.

WEBSTER-NESBITT UNIT HEATERS

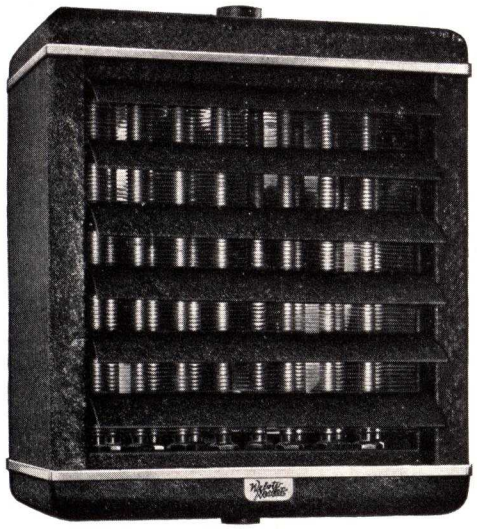


Fig. 56. Front View of Propeller-Fan, Ceiling-Suspension Type Webster-Nesbitt Unit Heater

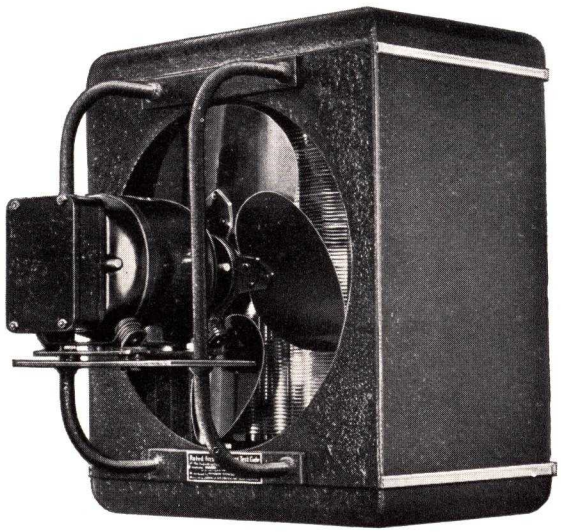


Fig. 57. Rear View of Webster-Nesbitt Unit Heater Showing Motor Mounting, Motor, and Propeller Fan

Webster-Nesbitt Unit Heaters are manufactured by John J. Nesbitt, Inc., Holmesburg, Philadelphia, Pa., and are distributed solely through Warren Webster & Company, Camden, New Jersey.

Webster-Nesbitt Propeller-Fan Unit Heaters provide a method of heating small- and medium-size enclosures such as stores, offices, garages, factories, and other structures having comparatively low ceilings. For the heating of large spaces the Webster-Nesbitt Centrifugal-Fan Giant Heater is recommended.

Webster-Nesbitt Unit Heaters are designed to circulate large volumes of air at comparatively low temperatures. By this method the heated air is mixed thoroughly with the room air to reduce overheating in upper areas and temperature stratification, and to assure quick heating, low fuel costs, and great comfort for room occupants.

Propeller-Fan Unit Heater

A ceiling-suspended unit that combines attractive appearance and quiet operation. Casings are constructed of heavy furniture steel, die-formed and welded, with black featherweave finish and stainless steel trim. Heating element is constructed of die-formed copper fins mechanically forced over ¾ inch seamless copper tubes forming a tight and permanent joint. Connection between tubes and steam and return headers is made with compression unions. Both headers are constructed of heavy, seamless, rectangular steel tubing, with connection couplings and tube bosses arc-welded to heater body. Heating element and headers are free to expand within the casing.

Steam and return connections are located in center of headers permitting support directly from steam piping in smaller sizes. In the larger sizes it is preferable to use hanger rods.

Fans are of the four-blade type designed to handle maximum volume of air with the minimum noise. In the Series 12, 16 and 20 units, which are specifically designed for quiet service, the fans have exceptionally wide overlapping blades of gradual pitch to reduce eddy current and blade tip noises. Discharge louvres are individually adjustable and, once properly set, may be fastened in position

All motors are provided with rubber-isolated bases that prevent transmission of motor hum or vibration to unit casing or piping. Motor support brackets are of steel tubing welded to casing and motor base plate, and are designed for low resistance to air flow.

Sizes and Capacities—Webster-Nesbitt Propeller-Fan Unit Heaters are made in six distinct casing sizes, and with air capacities at maximum fan speed increasing progressively from 860 c.f.m. to 4950 c.f.m. For each of the six sizes there are available three heating elements affording a wide range in final temperature for given air volume. This feature permits of flexibility in the selection of units for varying steam pressures or entering-air temperatures and fan speeds.

All heating assemblies are individually tested at the factory and guaranteed for working steam pressures up to 150 lb. per sq. in.

Write for Bulletin W-N 100 for complete description and information for selection and application.

Centrifugal-Fan Giant Heater

Recommended for the economical heating of large areas. Floor-mounted, wall-mounted, and ceiling-suspended types are available. Available with and without Thermadjust Temperature Control Damper which minimizes overheating and stratification, and effects substantial fuel savings.

Like the Propeller-Fan Unit, the Giant Heater is a product of high quality from the sturdy, efficient copper tube-and-fin radiators to the durable yet attractively designed casings.

Belt drive from motor is standard equipment. Direct-connected motors through flexible couplings can be furnished at additional cost.

Sizes and Capacities—Giant Heaters can be selected from a number of sizes and capacities ranging from 1895 c.f.m., 124,000 B.t.u., to 22,200 c.f.m., 1,350,000 B.t.u., with 2 lbs. steam and 60 degrees entering air.

Write for Bulletin W-N 102 for complete information.

Ratings

All ratings of Webster - Nesbitt Unit Heaters are based on tests made in accordance with the standard test code of Industrial Unit Heater Association and American Society of Heating and Ventilating Engineers.

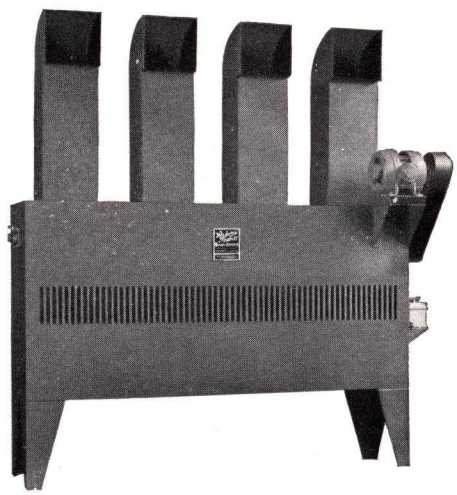


Fig. 58. The Webster-Nesbitt Centrifugal-Fan Giant Heater Is Available in a Full Range of Capacities for Heating Large Interiors

WARREN WEBSTER & COMPANY

FACTORY AND MAIN OFFICE—CAMDEN, N. J.

Cable Address: DELPHIC, U. S. A.

Darling Brothers, Ltd., P. O. Box 940, Montreal, Canada, Licensees and Manufacturers

WE solicit consideration for Webster Systems, Controls and Equipment by architects, engineers and building owners on the basis of an enviable record of service, backed by 49 years of experience (since 1888), an ample modern plant and resources, and sales and service offices in over 60 United States cities and in Canada. Webster Systems have been specified by fully one-third of the country's leading architects, and installed in more than 70,000 outstanding structures by more than 2,800 heating contractors. The greater portion of the Company's business consists of repeat orders. Webster engineers are prepared and able to co-operate effectively with architects.

Products and Services

"A Heating System for Every Need and Purpose" including Improved Webster Vacuum and Type "R" Systems of Steam Heating.

Effective central controls for Heating Systems including Webster MODERATOR Controls ("Control-by-the-Weather") and Webster HYLO Controls.

Webster System equipment including Concealed non-ferrous Radiation, Radiator Supply Valves, Return Traps, Drip and Heavy Duty Traps, Dirt Strainers, Boiler Return Traps, Vent Traps, Boiler Protectors, Damper Regulators, Lift Fittings, Expansion Joints, Vacuum Governors, Air Separating Tanks, etc. Series "78" and "79" Traps for process pressures (10-125 lbs. per sq. in.). Unit Heaters.

Webster Systems of Steam Heating

Webster Systems of Steam Heating are complete systems of *steam circulation*. WARREN WEBSTER & COMPANY manufacture for use in these systems, the products previously listed. It should be noted, however, that the Company does not manufacture, sell or assume responsibility for combustion equipment (oil burners, stokers, etc.), boilers, piping or other equipment not of its own manufacture. These should be selected and specified by the architect in the usual way.

A Heating System for Every Need and Purpose

Heating requirements vary so widely that no one type of heating system or no one control can be expected to provide comfort, economy and maximum investment return for all types and sizes of buildings. Realizing this, WARREN WEBSTER & COMPANY have consistently developed an entire group of Webster Systems of Steam Heating together with effective central controls—each built to meet certain conditions, each a combination of service, experience, equipment and engineering methods for the heating requirements of the individual installation.

REPRESENTATIVES AT

ALBANY, N. Y., 152 Washington Avenue
ATLANTA, GA., 152 Nassau Street, N. W.
ATLANTIC CITY, N. J., 529 Guarantee Trust Bldg.
BALTIMORE, MD., 606 Garrett Building
BIRMINGHAM, ALA., 2224 Comer Bldg.
BOSTON, MASS., 127 Federal Street
BUFFALO, N. Y., 311 Jackson Building
BUTTE, MONT., 910 So. Arizona Street
CHAMPAIGN, ILL., 620 W. Healy Street
CHARLOTTE, N. C., 711 Clement Ave.
CHATTANOOGA, TENN., 801 James Building
CHICAGO, ILL., 549 W. Washington Street
CINCINNATI, OHIO, 704 Race Street
CLEVELAND, OHIO, 2341 Carnegie Avenue
COLUMBUS, OHIO, 539 Huntington Bank Bldg.
DALLAS, TEX., 3549 Rosedale Street
DAYTON, OHIO, 1249 U. B. Building
DENVER, COLO., 1226-1228 California Street
DES MOINES, IOWA, 1003 Hubbell Building
DETROIT, MICH., 8316 Woodward Avenue
EASTON, PA., 207 Burke Street
EL PASO, TEX., 451 First National Bank Bldg.
GRAND RAPIDS, MICH., 228 Ottawa Ave. N.W.
GREAT FALLS, MONT., 1327 Eighth Avenue, N.
HARRISBURG, PA., 271 Cumberland St.
HOUSTON, TEX., 201 Petroleum Building
INDIANAPOLIS, IND., 333 No. Pennsylvania St.
JOHNSTOWN, PA., 405 Fisher Bldg.
KANSAS CITY, MO., 1800 Baltimore Ave.
LOS ANGELES, CAL., 320 Crocker Street
LOUISVILLE, KY., 817 Linwood St.
MEMPHIS, TENN., 423 Exchange Building
MILWAUKEE, WIS., 6088 Plankinton Building
MINNEAPOLIS, MINN., 84 So. Tenth Street
NEW HAVEN, CONN., 902 Chapel Street
NEW ORLEANS, LA., 824 Carondolet Street
NEW YORK, N. Y., 95 Madison Avenue
OMAHA, NEB., 1726 St. Mary's Ave.
ORLANDO, FLA., 210 So. Main Street
PHILADELPHIA, PA., 26 So. 20th Street
PHOENIX, ARIZ., 301 Phoenix Nat'l Bank Bldg.
PITTSBURGH, PA., 1007 Empire Building
PORTLAND, ORE., 300 Failing Building
RALEIGH, N. C., 211 S. McDowell St.
RICHMOND, VA., 16½ N. Ninth St.
ROANOKE, VA., 316 Liberty Trust Building
ROCHESTER, N. Y., Reynolds Arcade Bldg.
ROCK ISLAND, ILL., 310 Cleaveland Building
SAGINAW, MICH., 746 So. 4th Street
ST. LOUIS, MO., 2835 Washington Boulevard
SALT LAKE CITY, UTAH, 201 Bennett Bldg.
SAN FRANCISCO, CAL., 420 Market Street
SEATTLE, WASH., 326 Columbia Street
SPOKANE, WASH., 401 Radio Central Building
SYRACUSE, N. Y., 332 So. Warren Street
TOLEDO, OHIO, 1116 Madison Avenue
TULSA, OKLA., 114 E. 3rd St.
WASHINGTON, D. C., 814 Union Trust Bldg.
WHEELING, W. VA., P. O. Box 178
WICHITA, KAN., 1510 E. Douglas Ave.
WILKES-BARRE, PA., 1107 Miners Bank Bldg.
YAKIMA, WASH., 101 W. Yakima Avenue
YORK, PA., 139 W. King Street

FOREIGN

ATMOSPHERIC STEAM HEATING CO. (1936) Ltd., Hytor Works, Commerce Way, Purley Way, Croydon, England
LOUIS REYNERS, 11 Rue De Lay Buandrie, Brussels, Belgium
LOUIS REIJNERS, Meeuwenlaan 98-100, Amsterdam-Noord, Holland
TAYLORS LIMITED, Christchurch, New Zealand
H. P. GREGORY & CO., Ltd., Sydney, Australia
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MARSTRAND & ASTRUP A/S, Oslo, Norway

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ANDERSON PRODUCTS INCORPORATED

Originators of "Balanced Radiation by Controlled Venting"
CAMBRIDGE, MASS.

VENT-RITE RADIATOR AIR VALVES

Vent-Rite originated balanced radiation by controlled venting and made its application practical with Vent-Rite Valves.

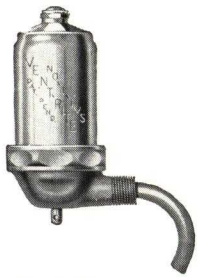
The venting orifice of Vent-Rite Valves is not split or divided into a few sizes of venting ports, but expressly provides an exceptionally wide range of venting-rates that make Controlled Steam Distribution practical.

Thus, with Vent-Rites it is possible to obtain the correct venting rate of each radiator in a system regardless of its size, location or pressure carried. Adjustment is on the under side of valve—out of sight—which precludes tampering or otherwise unbalancing the system.

Vent-Rite Valves are *noiseless in operation—positive in action—seal by float action against water—will not leak or sputter—close thermostatically under temperature.*

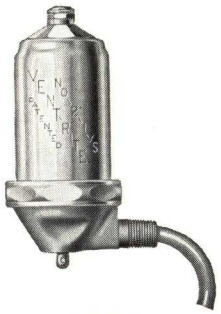
Vent-Rite Valves can be taken apart for cleaning with the use of an ordinary wrench. They have conventional union couplings with armoured copper-asbestos gaskets which insure leakproof joints.

All Vent-Rite Valves are made of the finest non-rusting—non-corroding materails. Bases are brass drop forgings; valve pins are nickel silver. Finish is chromium plate, except Air-Flo and No. 7 Valves which are nickel plated.



No. 1 Non-vacuum
⅛-in. side vent for radiators. Over-all height 2¾ in. Maximum venting orifice $\frac{1}{16}$-in. diameter

No. 51 Non-vacuum
⅛ in. bottom outlet for radiators. Overall height 3⅞ in. Maximum venting orifice $\frac{1}{16}$ in. diameter



No. 2 IVS Vacuum
⅛-in. side vent for radiators. Over-all height 3¾ in. Maximum venting orifice $\frac{1}{16}$-in. diameter

No. 62 IVS Vacuum
⅛ in. bottom outlet for radiators. Overall height 4⅝ in. Maximum venting orifice $\frac{1}{16}$ in. diameter

No. 3 Non-vacuum
¼-in. bottom outlet for mains, risers and convector type radiators. Over-all height 4½ in. Maximum venting orifice $\frac{1}{16}$-in. diameter

No. 4 IVS Vacuum
¼-in. bottom outlet for mains, risers and convector type radiators. Over-all height 4½ in. Maximum venting orifice $\frac{1}{16}$-in. diameter

AIR-FLOW VENT VALVES

No. 5 Non-vacuum
½-in. bottom outlet for mains and risers. Over-all height 3¾ in. Maximum venting orifice ⅛-in. diameter

No. 6 IVS Vacuum
½-in. bottom outlet for mains and risers. Over-all height 4¾ in. Maximum venting orifice ⅛-in. diameter

No. 11 Non-vacuum
⅛-in. i.p.t. side outlet. Syphon, float action, Non-adjustable. Non-take-apart

No. 31 Non-vacuum
⅛-in. i.p.t. bottom outlet. Float action, non-adjustable, non-take-apart

No. 33 Non-vacuum
Combination threaded bottom outlet. ¾-in. i.p.t. male, ⅜-in. i.p.t. female. Float action, non-adjustable, non-take-apart

Vent-Rite Balancer

¾-in. bottom outlet; over-all height 6¼ in. Installed on boiler or mains.

A solenoid operated valve which automatically returns a system under vacuum to atmospheric pressure at beginning of every firing cycle.

The Vent-Rite Balancer operating in conjunction with Vacuum Type Valves insures maximum heating efficiency and greatly improved performance on all Automatically Fired One-Pipe Steam Systems.

Complete details on the Vent-Rite Balancer sent on request.

No. 40 Gauge-Rite Compound Pressure and Vacuum Gauge
¼-in. bottom outlet; 3½-in. square dial

No. 7 Non-vacuum Riser Line Vent Valve
¾-in. bottom outlet. Riser is an integral part of the valve. Saves time, labor and material. Made in 2 sizes, 5½ and 8½ in. long

Vent-Rite Sales Policy

Vent-Rite Valves and Accessories are carried in stock and sold only through selected recognized wholesalers of plumbing and heating supplies, and—to the utmost limit of our ability and resources—they reach the consumer only through recognized trade channels.

GRINNELL COMPANY, INC.

EXECUTIVE OFFICES
PROVIDENCE, R. I.
OFFICES IN PRINCIPAL CITIES

For Automatic Sprinkler Systems, Unit Heaters, Prefabricated Piping and Pipe Hangers, see File Index

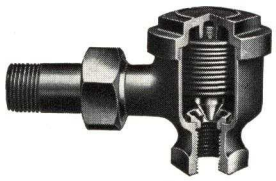
THERMOFLEX HEATING SPECIALTIES

For Vacuum, Vapor and Steam Pressures

The Thermoflex Trap is a product of proven superiority, built to meet the most exacting standards of manufacture and performance.

The heart of all Thermoflex Traps is the Hydron Bellows which is formed from selected seamless drawn tubing by a powerful internal hydraulic pressure. As this pressure is more severe than any which the Trap will ever be called upon to withstand under actual working conditions, every Thermoflex Trap is practically indestructible.

The exceptionally large orifice combined with high lift insures quick action and freedom from clogging. Thermoflex Traps are guaranteed for steam pressures up to 25 lbs., to 50 lbs. and to 125 lbs. A complete Catalog on Thermoflex Heating Specialties may be obtained upon request to GRINNELL COMPANY, INC., 277 West Exchange Street, Providence, R. I.



Radiator Trap
Fig. 12—Angle
Fig. 120—Angle
Fig. 12M—Angle

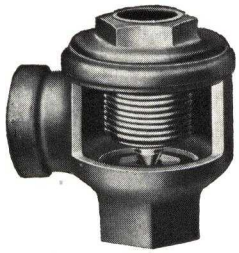
Radiator Traps

Applicable within stated pressure and capacity ranges to all types of radiation, drip points, main vents, and steam equipment returns.

Inlet Valves
Figs. 11 and 15

Packless Radiator Inlet Valves

All bronze construction, chromium plated. Large dial plate, easily read. Furnished with non-heating Lever or Wheel Handles in standard or extra heavy pattern.



Iron Body Trap
Fig. 4—Angle
Fig. 4M—Angle

Drip Traps

Applicable within stated pressure and capacity ranges to pipe coils, unit heaters and ventilators where suitable cooling leg is provided, drip points, and steam equipment returns.

High Pressure Trap
Fig. 100A

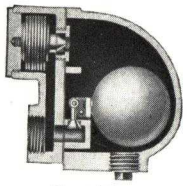
High Pressure Traps

Applicable within stated pressure and capacity ranges to hospital, kitchen, laundry, and industrial steam equipment returns, and drip points.

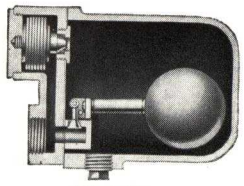
Blast Traps

Thermoflex Blast Traps are high capacity traps utilizing a combined float and thermostatic action to eliminate large volumes of air and water from steam lines. Water is passed through large orifice valve, and air is vented through thermostatic by-pass operated by the same high quality bellows used in Thermoflex traps of the thermostatic type.

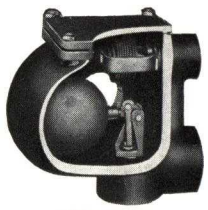
Blast traps are constructed with heavy cast iron body and high test seamless copper ball floats. Low pressure series has bronze working parts and high pressure series has stainless steel trim.



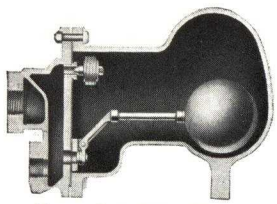
Blast Trap
Fig. A



Blast Trap
Fig. 00



Blast Trap
Fig. 0

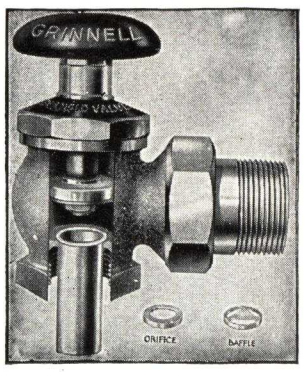


Heavy Duty Blast Trap
Figs. 1, 2, 3 and 4

Grinnell Equiflo Valves

For Forced Hot Water Heating

The designing of forced circulation hot water heating systems is so simplified by the Grinnell Equiflo Valve that they can be laid out and installed as easily as vapor or steam systems. This valve consists of a regular type packless radiator valve with a cartridge or tube made up of a series of orifices and baffles capable of setting up any required frictional resistance. This method of establishing any desired resistance does away with elaborate calculation of pipe sizes. Grinnell guarantees perfectly balanced circulation to each and every radiator where these valves are installed throughout the system.



Equiflo Data Book sent to interested parties.

HOFFMAN SPECIALTY COMPANY, INC.

EXECUTIVE OFFICES
500 Fifth Avenue, NEW YORK, N. Y.
MAIN OFFICE AND FACTORY, WATERBURY, CONN.
SALES REPRESENTATIVES IN PRINCIPAL CITIES

Equipment for Steam Heating

Manufacturers of Adjustable Port Radiator Venting Valves, Quick Vents, Supply Valves, Thermostatic Traps and Basement Specialties for Controlled Heat Systems; Hoffman Economy Vacuum and Condensation Pumps and the Hoffman Air Conditioner.

Catalogs

Catalogs covering the above specialties in detail will be furnished upon request.

No. 1 Siphon Air Valve

With the Hoffman Adjustable Orifice Venting Ports, a one-pipe steam heating system can be brought to a maximum degree of efficiency.

Now by varying the rate of venting the air from a one-pipe steam radiator, the flow of steam into the radiator can be controlled. By accelerating the venting of large radiators and restricting the venting of small radiators the same proportion of each radiator can be heated in a given time. Likewise, if desired, certain radiators can be made to heat more rapidly than others.

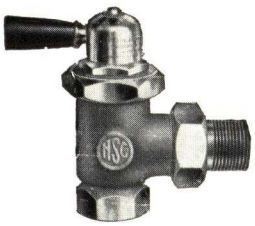
Siphon Air Valves—The No. 1 Siphon Air Valve is used for venting radiators on one and two-pipe steam systems.

Siphon Air and Vacuum Valves—The No. 2 Siphon Air and Vacuum Valve which has proved its supremacy over a period of years is used on radiators for one-pipe vacuum systems.

Quick Vents—A large variety of quick vent valves for use on ends of mains is available in both straight venting and vacuum types.

A competitive line of valves is also available at lower prices.

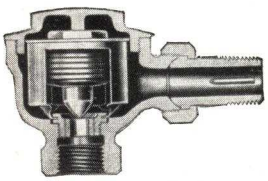
No. 2 Siphon Air and Vacuum Valve



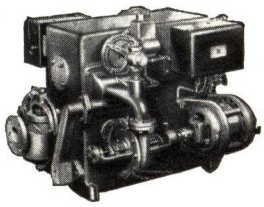
No. 7 Modulating Valve

The valve and trap shown constitute the two most important items of a regular "Hoffman Controlled Heat" System. In place of the No. 7 valve shown numerous other types of supply valves may be used. The No. 8A trap likewise is only one of the many types and sizes of traps available to meet practically all conditions existing in a two-pipe steam heating system where traps are required.

Basement specialties such as the differential loop and the boiler return trap are used in conjunction with the above specialties for returning the condensation, on two-pipe steam installations, to the boiler.

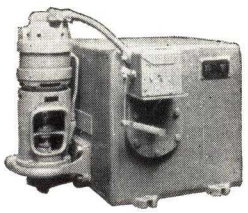


No. 8A—½"



Vacuum Pump

On large installations or wherever special conditions necessitate the use of vacuum or condensation pumps we recommend the use of a Hoffman Economy unit. This line of pumps which has rendered unfailing service for many years offers a unit to meet any heating requirement and covers a wide range of capacities and pressures.



Condensation Pump

Hoffman products are sold and stocked by leading wholesalers of heating and plumbing supplies everywhere. Hoffman representatives are available to assist in selection of suitable equipment for various services.

McDONNELL & MILLER

Manufacturers of McDonnell Boiler Water Level Controls

General Offices, Wrigley Building, CHICAGO, ILL.

"Doing One M&M BOILER CONTROLS *Thing Well"*

Products

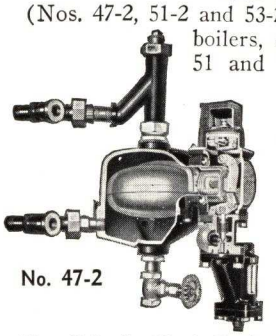
Boiler Water Feeders; Combined Boiler Feeders and Low Water Cut-offs; Low Water Cut-offs; Combined Low Water Cut-offs and Pressure Controls; Pump Controls; Low Water Alarms; and related equipment.

Boiler Water Feeders

(Nos. 47, 51 and 53) automatically supply water to heating boilers whenever boiler water level tends to fall to danger point. Their dependable operation is assured by McDonnell "cool feed valve" which prevents lime and scale formation at the valve—by packless construction, stainless steel valves, the McDonnell "Quick-Hook-Up" feature and many other advancements that are combined in no other boiler feeders (see 32-page catalog).

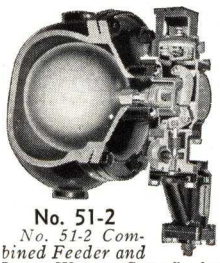
Combined Water Feeders and Low Water Cut-offs

(Nos. 47-2, 51-2 and 53-2) for automatically fired boilers, are same as the Nos. 47, 51 and 53 with the No. 2 Low Water Cut-off switch added as shown in illustrations. In these units the feeder takes care of all normal operation and the switch merely stands by to cut the current to the firing means in event of an extreme emergency such as priming and foaming or failure of water supply. These combined feeders and cut-offs "make boiler water level as automatic as firing."



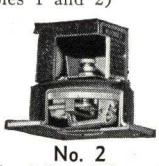
No. 47-2

No. 47-2 Combined Feeder and Low Water Cut-off with "Quick-Hook-Up" for automatically fired boilers below 5,000 sq. ft. capacity. No. 47 for hand fired boilers in same range is identical except for the No. 2 cut-off switch (see below)



No. 51-2

No. 51-2 Combined Feeder and Low Water Cut-off for automatically fired boilers above 5,000 sq. ft. capacity. No. 51, for hand fired boilers, is the same, except for No. 2 switch. No. 53 and No. 53-2 are similar in appearance but of heavier construction for higher pressures (see Tables 1 and 2)



No. 2

No. 2 Low Water Cut-off Switch used on Nos. 47, 51 and 53 Safety Feeders. Has high voltage cut-off contacts and low voltage alarm contacts. Can be furnished on feeders or installed easily after feeders are in place on boilers

Low Water Cut-offs

(Nos. 66, 60-A and 60-B) are for automatically fired boilers where the owner is willing to sacrifice convenience of combined feeders and cut-offs to secure a slightly lower price. They will dependably stop the burner when water level reaches the danger zone, but of course they do not supply water to the boiler. Low water cut-offs are also available with built-in pressure control (Nos. 62-A and 62-B).

The No. 150 is for use on boilers with pressures up to 150 lbs. It can be used as either a low water cut-off, or a combined low water cut-off, pump control and low water alarm.

Service recommendations and typical specifications follow:

Boiler size	Steam pressure	McDonnell product to use
Table 1—For Hand Fired Boilers		
Up to 5000 sq. ft.	Under 25 lbs.	No. 47 Water Feeder
Above 5000 sq. ft.	Under 25 lbs.	No. 51 Water Feeder
Any size	25 to 75 lbs.	No. 53 Water Feeder
Table 2—Water Feeder—Low Water Cut-off Combinations		
Up to 5000 sq. ft.	Under 25 lbs.	No. 47-2 Feeder-Cut-off Combination
Above 5000 sq. ft.	Under 25 lbs.	No. 51-2 Feeder-Cut-off Combination
Any size	25 to 75 lbs.	No. 53-2 Feeder-Cut-off Combination
Table 3—Low Water Cut-offs		
Any size	Under 15 lbs.	No. 66 Low Water Cut-off
Any size	15 to 25 lbs.	No. 60-A or 60-B Low Water Cut-off
Any size	25 to 150 lbs.	No. 150 Low Water Cut-off
Low Water Cut-off—Pressure Control Combinations		
Any size	Under 12 lbs.	No. 62-A or No. 62-B Combined Cut-off and Pressure Control

Typical Specifications for Boiler Water Feeder or Combined Feeder and Cut-off

Furnish and install complete in every essential detail for each boiler unit, Automatic Boiler Water Feeder—and Low Water Cut-off (if automatically fired)—equipment as manufactured by McDonnell & Miller, Wrigley Building, Chicago.

Boiler Water Feeder to be (insert *) of the manufacturer's most improved design, with all working parts isolated from steam and hot water zone by packless sylphon construction. Float power to be multiplied through a leverage mechanism which contains a self-centering roller directly above valve stem. All bearing points, pivots, and levers to be outside of steam and water zone. Valve cone and seat to be stainless steel, removable and renewable. A strainer to be incorporated in the design and to have a solderless basket mounted on a flange for easy removal. Feeder to be installed complete with all piping, valves, fittings, and specialties, as indicated by descriptive diagram in the manufacturer's construction bulletin.

Upon completion of the installation, the contractor to place this automatic equipment in successful operation, subject to acceptance and approval of the architect's . . . . . engineer.

Typical Specifications for Low Water Cut-off

Furnish and install on each boiler, in accordance with the manufacturer's instructions, a McDonnell & Miller No. (insert †) Low Water Cut-off, to be float operated and to have packless construction. Control wiring to be of flexible armored cable. All wiring to meet requirements of City Electrical Inspection Department and the National Board of Fire Underwriters.

*If job is hand fired, insert: "No. 47," "No. 51," or "No. 53," as indicated by service conditions in Table 1.

*If job is automatically fired, insert: "No. 47-2," No. 51-2" or "No. 53-2," as indicated by service conditions in Table 2.

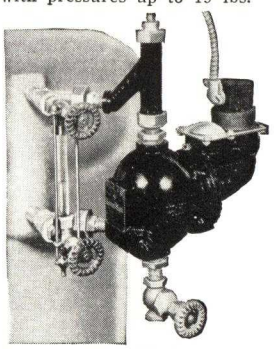
When combined units No. 47-2, No. 51-2, or No. 53-2 are specified, add the following paragraph to specifications: "Make electrical connections for low water switch to control fuel supply equipment, so that the fuel is automatically shut off by the low boiler water control. Control wiring to be of flexible armored cable. All wiring to meet the requirements of the City Electrical Inspection Department and the National Board of Fire Underwriters."

†Insert at this point "No. 66," "No. 60-A," "No. 60-B," or "No. 150" as indicated by service conditions in Table 3. (If No. 62-A or No. 62-B is indicated specifications should cover the pressure control feature as outlined in the McDonnell Catalog.)

New 32-page catalog contains complete descriptions, capacity chart, installation instructions, wiring diagrams, dimensions, etc.

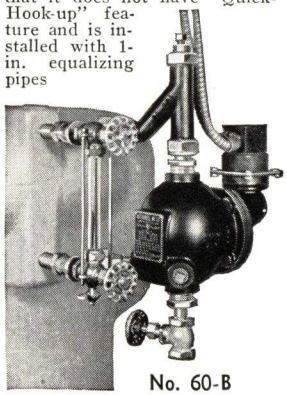
No. 66

No. 66. A simple, compact, moderately priced low water cut-off with "Quick-Hook-Up" feature for boilers of any size with pressures up to 15 lbs.



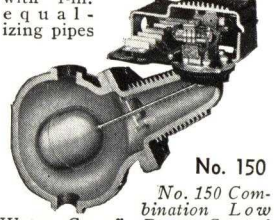
No. 62-B

No. 62-B Low Water Cut-off with built-in pressure control adjustable from 1 to 12 lbs. No. 62-A is the same, except that it does not have "Quick-Hook-up" feature and is installed with 1-in. equalizing pipes



No. 60-B

No. 60-B Low Water Cut-off with "Quick-Hook-Up" fittings for boilers of any size; pressures up to 25 lbs. No. 60-A is the same, except that it does not have "Quick-Hook-Up" feature and is installed with 1-in. equalizing pipes



No. 150

No. 150 Combination Low Water Cut-off, Pump Control and Low Water Alarm built to stand up in high pressure service. Float operates two mercury switches. One closes pump circuit when water level falls; the other cuts burner circuit and completes alarm circuit when water level falls to danger zone. Maximum steam pressure, 150 lbs.

NEW YORK AIR VALVE CORPORATION

(SINCE 1898)

611-621 Broadway, NEW YORK, N. Y.

CHICAGO, ILL. CLEVELAND, OHIO DETROIT, MICH. PITTSBURGH, PA. PHILADELPHIA, PA. BOSTON, MASS. ST. LOUIS, MO.
BRANCHES IN OTHER PRINCIPAL CITIES

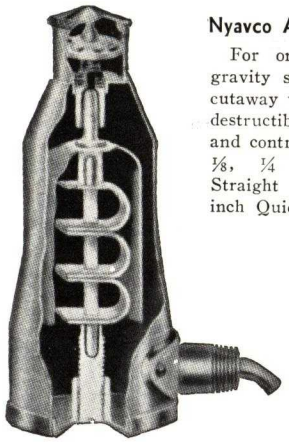
NYAVCO ORIFICE "CONTROL BY VENTING" VALVES

Air which fills each unheated radiator must be driven out by entering steam before heat is obtained. Using this air as an "air brake"—and thus limiting or increasing its evacuation time on each radiator—accordingly slows or increases speed of entering steam and its consequent heating time.

The NYAVCO Orifice Control Air Valve incorporates in one valve six gradually ascending vent speeds. This makes possible the simultaneous heating of the largest and smallest radiator—or the equalization in steam delivery to the farthest unit or unit nearest to the boiler. Thus balancing the job.

On coal-fired constant heat jobs, or with rooms containing the automatic control (on automatic gas, oil or stoker fired jobs), the NYAVCO method of metered venting can so "time" every radiator, large or small, near or far, to heat simultaneously.

Because of its unusually large vent port, NYAVCO venting is three to five times faster than the usual air valve. It can only be set by the heating man. Consequently, it is tamper-proof—because it is "locked" in the "armored cap" by him. Has a definite metered disc. Does not depend on thread or needle valve, but on actual room or distance equalization on each setting.



Construction of Air Valve No. 1

Nyavco Air Valve No. 1

For one or two pipe gravity steam jobs. Note cutaway view showing indestructible construction and control disc. Made in ⅛, ¼ and ½-inch Straight Shank and ¾-inch Quick Vent.

No. 1

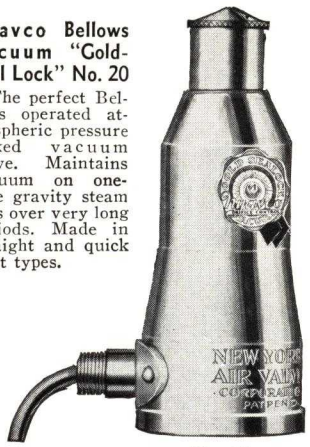
Nyavco Vacu-Seal Ball Check No. 2

A mica disc check type vacuum valve—for use on intermittent heating jobs where price is a consideration. Made in ⅛, ¼ and ½-inch Straight Shank and ¾-inch Quick Vent.

No. 2

Nyavco Bellows Vacuum "Gold-Seal Lock" No. 20

The perfect Bellows operated atmospheric pressure locked vacuum valve. Maintains vacuum on one-pipe gravity steam jobs over very long periods. Made in straight and quick vent types.



No. 20

(Valves One-half Actual Size)

Nyavco ORIFICE CONTROL

Disc shown in neck or control chamber of valve is set upon a hex "seat" which fit into hex socket on bottom of disc, thus presenting one size each time disc is picked out and reset. As each resetting is made—beginning with .095—a reduction of the vent port is secured: thus .085; .075; .065; .055 and the smallest port of .045.

.095 is to .045 as 5 is to 1
.085 is to .045 as 4 is to 1
.075 is to .045 as 3 is to 1
.065 is to .045 as 2 is to 1
.055 is to .045 as 1½ is to 1

Thus a radiator may be vented five times as fast as another using the smallest opening—and correspondingly lower on each adjustment. No screw thread or needle valve adjustment. Each is accurate and cannot vary.

Straight and Quick Vent Type

Right: Giant Three-Speed Air Eliminator

Water Hammer—Indestructibility

NYAVCO has no sealed float. Because of its open float and bi-metallic mechanism, depending upon actual steam contact (not hot vapors or hot water rushes) to close, it functions perfectly without danger of rupture or collapse. This is due to its "pressure equalized" in-and-out float and bi-metallic mechanism.

We claim any sealed float valve, regardless of name prestige or price paid, will be internally injured when subjected to the crash of "water hammer"—not necessarily forcefully strong but by intermittent pounding of that demon of one-pipe jobs. A displacement of a fraction of its 25,000th-inch valve setting "disorganizes" perfect adjustment. NYAVCO has nothing to rupture, nothing to work out of adjustment. Fatigue-proof, rust-proof, shock-proof. Write for details.

Giant Three-Speed Air Eliminator

For rapid elimination of air from large mains, coils, air conditioning units, unit heaters, etc. Three-speed control: ⅛, $\frac{3}{16}$ and ¼-in.; secured by removing screw from speed size desired.

Made in ½ and ¾-in. male i. p. connection. Wherever possible the use of ¾-in. is suggested.

Height over all—6½-in.

Approximate venting capacities:

⅛-in. sized port suggested for load up to 1,500 ft.
$\frac{3}{16}$-in. sized port suggested for load of 1,500 ft. to 3,000 ft.
¼-in. sized port suggested for load of 3,000 ft. up.
Valve combines all three sizes in one.

THE NASH ENGINEERING COMPANY

201 Wilson Road
SOUTH NORWALK, CONN.

Sales and Service Offices in most of the principal cities in the United States and Canada, and abroad in London, Oslo, Amsterdam, Brussels, Stockholm, Sydney, and Tokyo

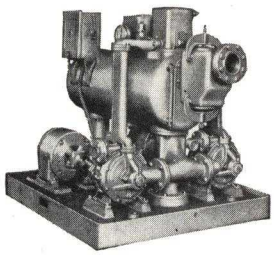
Products

Return Line and Air Line VACUUM STEAM HEATING PUMPS; CONDENSATION PUMPS; CENTRIFUGAL PUMPS, Standard and Suction; COMPRESSORS and VACUUM PUMPS for air and gases; SEWAGE EJECTORS; SEWAGE PUMPS; SUMP PUMPS.

Return Line Vacuum Steam Heating Pump

Removes air and condensation from return lines of vacuum steam heating systems, discharges the air to the atmosphere, and returns the water to the boiler.

Pump consists of two independent units combined in a single casing—an air unit and a water unit. Impellers of both units are mounted on the same shaft, supported on annular ball bearings outside the casing. Pump is bronze fitted.



Jennings Motor-driven Return Line Vacuum Steam Heating Pump

Air unit exhausts air and vapors and delivers these to the atmosphere without back pressure. Water unit removes the condensation and pumps it directly into the boiler. By handling the air independently of the water, power is saved.

Supplied either direct-connected to standard electric motors, for belt drive, or for steam turbine drive. For continuous operation, or with automatic control.

Furnished in standard sizes with capacities ranging from 4 to 400 g.p.m. of water and 3 to 171 cu. ft. per minute of air. For serving up to 300,000 sq. ft. of equivalent direct radiation. Larger units special.

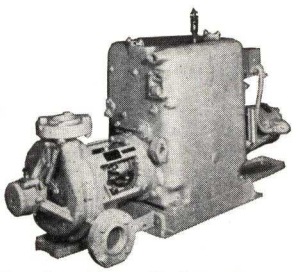
Bulletins 264 and 267 on request.

Jennings Vapor Turbine Vacuum Heating Pumps

The Vapor Turbine combines all the advantages of the standard return line heating pumps with a new type of drive, a specially designed low pressure turbine which operates directly on steam from the heating mains. Requires a differential of only 5 in. of mercury, and returns that steam to the heating system with practically no heat loss.

This pump affords the safety and economy which goes with a continuous condensation return and steady vacuum, and at no cost for electric current.

This outfit is equipped with a complete electrically operated stand-by unit that will automatically operate should the turbine be cut out for inspection or servicing.



Jennings Vapor Turbine Return Line Vacuum Heating Pump

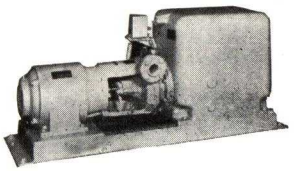
Furnished in standard sizes with capacities ranging from 10 to 150 g.p.m. of water, and 3 to 50 cu. ft. per minute of air. For services up to 150,000 sq. ft. equivalent direct radiation. Larger sizes built special.

Bulletin 246 on request.

Condensation Pump

Removes the condensation from radiators in return line steam heating systems, particularly radiators set below the boiler water line level, and pumps the condensation back to the boiler.

By making the pump casing a part of the return tank, and bolting the motor base to the tank, floor space is conserved. The rectangular construction permits installation in a corner against the wall.



Jennings Motor-driven Condensation Pump

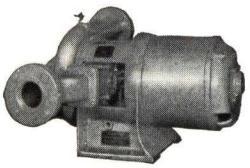
Supplied in standard sizes with capacities ranging from 4 to 225 g.p.m. of water. For serving up to 150,000 sq. ft. of equivalent direct radiation.

Bulletin 241 on request.

Standard Centrifugal Pump

For all centrifugal pump services.

Compact—motor armature and pump impeller are mounted on the same shaft. Simplified—no bearings in pump casing, only one stuffing box. Accessible—pump impeller can be removed without breaking pipe connections, touching packing, or disturbing shaft alignment.



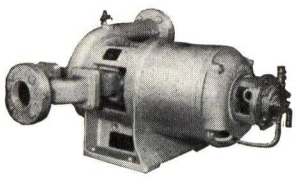
Jennings Motor-driven Standard Centrifugal Pump

Sizes 1, 1¼, 1½, 2, 3, 4, and 6 in. Capacities to 1900 g.p.m., heads to 300 ft. Bronze fitted standard construction; also all-bronze or all-iron for special services.

Bulletin 155 on request.

Centrifugal Pump Operating with Suction Lift

When the Jennings Suction Centrifugal is started, the built-in Nash Hytor Vacuum Pump exhausts the air from the casing and suction piping. Water is quickly drawn into the pump. Full rated capacity is delivered without delay.



Jennings Motor-driven Suction (Self-priming) Centrifugal Pump

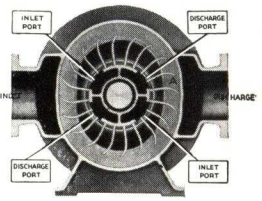
Successful performance is assured under conditions where water level is likely to fall, or where air or gas is handled together with the water being pumped. Intermittent operation is possible without a foot valve.

Furnished in standard sizes with capacities up to 1900 g.p.m. Heads up to 300 ft. Supplied either bronze fitted or all-bronze construction.

Bulletin 155 on request.

Compressors and Vacuum Pumps for Air and Gases

Operation is as follows: the rotor, consisting of a cylindrical hub, around the periphery of which are chambers or spaces formed by heavy shrouds cast integrally, revolves freely in an elliptical casing or housing filled with water.



New Conical Type Nash Hytor Compressor or Vacuum Pump
Showing the unique principle of hydro-turbine operation

As the rotor turns, it carries the water around with it. The water, under the influence of centrifugal force, is compelled to follow the contour of the casing, and alternately to enter and to leave the rotor chambers, twice in each revolution.

As the water recedes from the rotor, air is drawn through the cone inlet port and then through the ports in bottom of rotor chambers into the rotor. As the water is subsequently forced back into the rotor by the converging casing, the air is compressed and then discharged through the ports in bottom of rotor chambers, then through cone outlet ports and finally out through pump discharge.

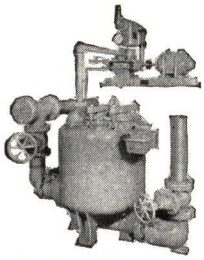
A separator, supplied with each compressor, frees the delivered compressed air of entrained moisture.

Supplied in several standard sizes for handling up to 6000 cu. ft. of air per minute. Regularly supplied for pressures up to 75 lb.; vacuums up to 28 in. of mercury. For higher pressures and vacuums, special equipment will be furnished.

Bulletins 252, 255, 258 and 261 on request.

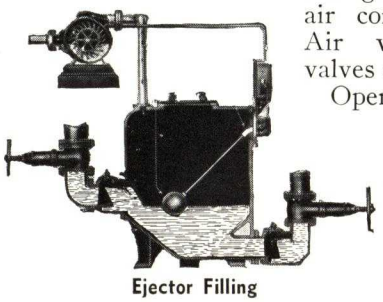
Sewage Ejector

For pumping unscreened sewage or drainage from basements below the street sewer level, handling crude sewage from low level districts, pumping effluent, sludge and other heavy liquids.



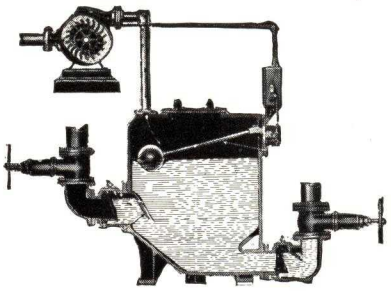
Jennings Pneumatic Sewage Ejector

The Jennings Sewage Ejector is of the pneumatic type. Air, compressed to the necessary working pressure by a Nash Hytor Air Compressor, is used as the motive power to pump the accumulated sewage from a pot to the sewer. Air is compressed only to the pressure at which it is used. There are no air storage tanks, reciprocating air compressors or screens. Air valves and reducing valves are avoided.



Ejector Filling

Operation is as follows: Sewage, under the action of gravity, flows through the inlet check valve into the pot. As it accumulates, it raises a ball float which, when the pot is full, actuates a float switch, thereby starting up the Nash Hytor Air Compressor.



Ejector Discharging

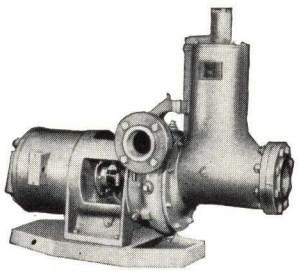
Compressed air is delivered into the top of the pot, closing the inlet check valve and expelling the sewage through the outlet check valve. When the pot has been emptied, the float, having reached the lower limit of its travel, opens float switch stopping compressor, through which, then, the air in the pot is vented. Sewage again flows by gravity into the pot, repeating the cycle.

Furnished in several standard sizes up to 1500 gal. per minute against heads up to 100 ft.

Bulletins 103 and 108 on request.

Suction Sump and Sewage Pumps—Standard Type

The Jennings Suction Sump Pump is a self-priming centrifugal pump for handling seepage water and liquids reasonably free from solids. The Suction Sewage Pump is fitted with a non-clog type impeller. Both pumps are mounted entirely above the sump where they are always readily accessible. Only the suction pipe is submerged.



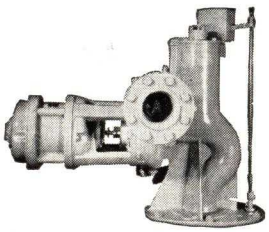
Jennings Motor-driven Suction Sewage Pump, Standard Type

There are only two moving parts: the centrifugal impeller and the vacuum priming pump rotor. Both rotate without metal-to-metal contact in the casing. Both are mounted on the same shaft that carries the rotor of the driving electric motor, making possible a single compact assembly.

Capacities and heads to meet all requirements.

Bulletins 159 and 161 on request.

Suction Sump and Sewage Pumps—Pedestal Type



Jennings Motor-driven Suction Sewage Pump, Pedestal Type

Jennings Suction Sump and Sewage Pumps, Pedestal Type, provide even greater convenience and compactness. This type pump is mounted directly on the pit cover and requires no other foundation. The base of the pump fits a standard manhole and, when bolted down, forms a gas-tight cover.

Furnished only in medium capacities and heads.

Bulletin 188 on request.

Bulletins and Complete Information

Bulletins and complete information covering any and all of the pumps listed on these pages will be sent promptly on request.

ESTABLISHED 1886

PENBERTHY INJECTOR CO.

Penberthy Hot Water Heating Specialties—Reducing Valves—Relief Valves

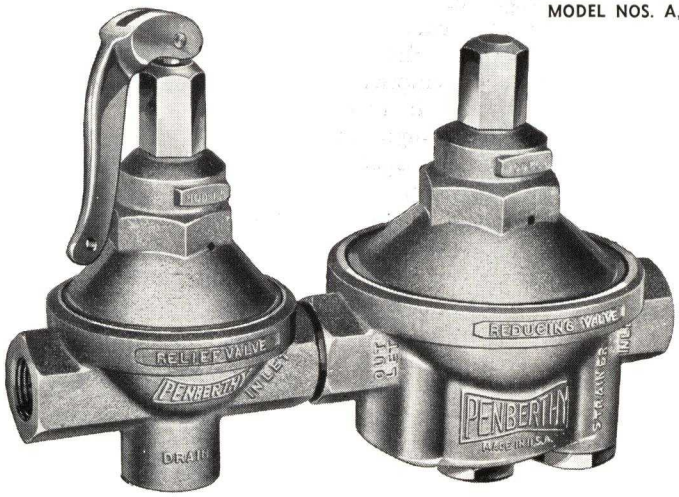
DETROIT, MICH.

CANADIAN PLANT: WINDSOR, ONT.

For Penberthy Sump Pumps and Cellar Drainers, see File Index

PENBERTHY PRESSURE AND RELIEF CONTROL

MODEL NOS. A, B AND C



Constructed of High Grade Steam Bronze
(Model C not illustrated)

This combination unit is used for automatically filling a hot water heating system and for automatically relieving any excess pressure that may occur in that system. It consists of a Penberthy Relief Valve in combination with a Penberthy Reducing Valve. The relief valve is equipped with a lever for testing. This control complies with the A. S. M. E. Code.

The fact that the Penberthy Pressure and Relief Control is a quality product throughout will be evident from the following description. It is made from high grade steam bronze; precision machine work assures the interchangeability of all parts. Sediment strainers made of monel are provided in both the relief and reducing valve to insure protection of seats against injury from scale and other foreign matter. Both valves are of diaphragm type and require no guide wings. Diaphragms are laminated nickel silver and maintain their flexibility without brittleness. Gaskets above and below the diaphragms and relieved casting corners prevent binding and assure maximum effectiveness of the diaphragms.

Special composition discs are sufficiently hard not to interfere with valve flow, yet soft enough to prevent cracking and assure perfect seating. Adjusting screws on both valves are protected by caps so that adjustment cannot easily be tampered with. Springs are carefully calibrated and have high fatigue resistance. The only spring exposed to water is the spring below seat in the reducing valve which is phosphorous bronze and makes this valve more sensitive at lower pressure differential.

The principal difference between Model A and Model B is that Model A Reducing Valve has a greater capacity and is recommended where quick filling of the system is desirable. Model C (not illustrated) has one-piece body construction and is recommended where initial cost is the dominant factor.

Model No.	List price	Pipe, in.	Reducing valve	Relief valve
A	$16.00	½	201	111
B	14.00	½	211	111
*C	10.00	½	One-piece construction	

Relief valve set at 28 lbs. and reducing valve set at 12 lbs.
*Model C not illustrated.

PENBERTHY RELIEF VALVES

Model Nos. 111, 112, 121, 122, 511, 512, 521 and 522

Constructed of High Grade Steam Bronze

Model Nos. 1, 2, 11, 12, 311 and 312

Automatically relieves any excess pressure in system. Complies with A. S. M. E. Code and has lever for testing. Carefully made of high grade bronze throughout and has built-in monel strainer.

Laminated diaphragm is nickel silver that maintains its flexibility without brittleness; gasket above and below diaphragm, and relieved casting corners prevent binding and assure maximum effectiveness of diaphragm.

Spring is carefully calibrated and has high fatigue resistance; it is not exposed to water. Adjusting screw is protected. Special composition renewable disc assures perfect seating.

PRESSURE RELIEF VALVES FOR HOT WATER HEATING SYSTEMS

Conform with A.S.M.E. heating code. Set to relieve at 28 lbs. unless otherwise specified. All valves are adjustable up to their maximum ratings. Minimum adjustment 5 lbs.

Valve No.	Size, in.	Type	Maximum adjustment, lbs.	Connections	Remarks
1	½	Dead end	28-32	Angle double female	Large diaphragm
2	¾	Dead end	28-32	Angle double female	Large diaphragm
11	½	Dead end	28-32	Angle double female	Small diaphragm
12	¾	Dead end	28-32	Angle double female	Small diaphragm
111	½	In-line	28-32	Male and female	Small diaphragm
112	¾	In-line	28-32	Male and female	Small diaphragm
121	½	In-line	28-32	Double female	Small diaphragm
122	¾	In-line	28-32	Double female	Small diaphragm

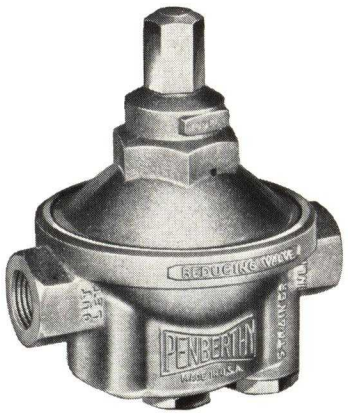
PRESSURE RELIEF VALVES FOR HIGH PRESSURE WATER SUPPLY SERVICE

Set to relieve at 50 lbs. unless otherwise specified. All valves are adjustable up to their maximum ratings. Minimum recommended adjustment 25 lbs.

Valve No.	Size, in.	Type	Maximum adjustment, lbs.	Connections	Remarks
311	½	Dead end	120-130	Angle double female	Small diaphragm
312	¾	Dead end	120-130	Angle double female	Small diaphragm
511	½	In-line	120-130	Male and female	Small diaphragm
512	¾	In-line	120-130	Male and female	Small diaphragm
521	½	In-line	120-130	Double female	Small diaphragm
522	¾	In-line	120-130	Double female	Small diaphragm

Refer to bulletin No. 4787—No. 4947-5019.

PENBERTHY REDUCING VALVES



Model Nos. 201, 202, 211, 401, 402, 403, 409, 410 and 411
Constructed of High Grade Steam ***Bronze***

Automatically reduces city water pressure and maintains desired working pressure in system. Complies with A. S. M. E. Code. Built-in monel strainer is easily removable. High grade steam bronze used throughout; precision machine work assures interchangeability of all parts.

Laminated nickel silver diaphragm maintains its flexibility without brittleness. Main spring is carefully calibrated; it has high fatigue resistance and is not exposed to water. Spring below seat is phosphorous bronze and makes valve more sensitive at low pressure differential.

Special composition disc assures perfect seat. Adjusting screw is protected with cap.

PRESSURE REDUCING VALVES FOR HOT WATER HEATING SYSTEMS

Maximum initial pressure 100 lbs. Set for a delivery pressure of 12 lbs. unless otherwise specified. All valves are adjustable up to their maximum ratings.

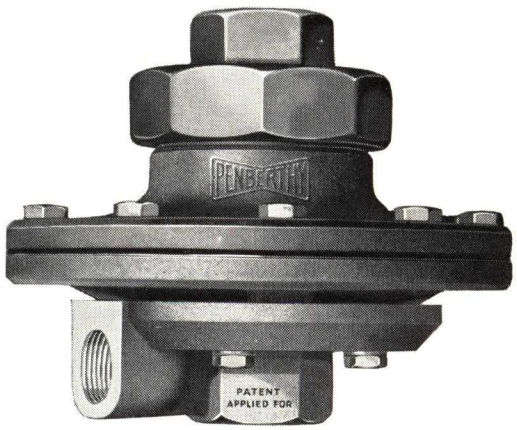
Model No.	List price	Pipe size, in.	Initial pressure, lb.	Delivery pressures			Capacity	Seat
				Factory setting, lb.	Adjustable to lb.			
					Max.	Min.		
201	$10.00	½	100	12	35	5	Extra large	Integral
202	12.00	¾	100	12	35	5	Extra large	Integral
211	8.00	½	100	12	35	5	Standard	Integral

PRESSURE REDUCING VALVES FOR DOMESTIC WATER SUPPLY SYSTEMS AND AIR SERVICE

Maximum initial pressure of 150 lbs. Set for a delivery pressure of 45 lbs. unless otherwise specified. All valves are adjustable up to their maximum ratings.

Model No.	List price	Pipe size, in.	Initial pressure, lb.	Delivery pressures			Capacity	Seat
				Factory setting, lb.	Adjustable to lb.			
					Max.	Min.		
401	$10.00	½	150	45	115	10	Extra large	Integral
402	12.00	¾	150	45	115	10	Extra large	Integral
403	20.00	1	150	45	115	10	Extra large	Renewable Monel metal
409	6.00	¼	150	45	115	20	Standard	Integral
410	6.00	⅜	150	45	115	20	Standard	Integral
411	8.00	½	150	45	115	20	Standard	Integral

PENBERTHY VACUUM BREAKER PREVENTS BACK SIPHONAGE



A safety, non-return valve that prevents back siphonage—provides positive protection of the fresh water supply line from contamination through cross connections, etc. Installed on pressure side, it does not interfere with normal flow of water, but fully opens line to the atmosphere the instant pressure drops, or a vacuum is created.

Purpose

The Penberthy Vacuum Breaker is designed for installation in water systems where exist possibilities of contaminated water being siphoned into fresh water lines when a partial vacuum, or an excessive pressure drop occurs in the water main.

Operation

The Penberthy Vacuum Breaker will start functioning at the slightest degree of vacuum in the water line. Asmospheric pressure acting over the diaphragm raises the valve seat, admitting air into the system. An auxiliary built-in check valve throttles the vacuum effect down to a degree where the air intake can easily prevent any suction lifting of foreign water up into the system.

Construction

High grade steam bronze.

Substantial and simple design. Positive action. A combined union and strainer provided at inlet end permits easy installation and protects valve seat against injury from scale, chips, etc.

Check Valve—Built-in, especially adapted to prevent sticking and allow ample water flow.

Diaphragm—Laminated, phosphor bronze of extra large effective area, automatically relieved of over stresses.

Seat—Metallic, insures sensitive functioning, eliminates danger of disc sticking.

Shield over air inlet ports excludes dirt.

Workmanship—All parts accurately machined, easily accessible and interchangeable in service.

Each unit carefully tested and inspected.

Number	Pipe size, in.	Dimensions, in.		Weight boxed, lbs.	List price
		Height	Width		
VB-1	½	4 9/16	5½	6½	$10.00
VB-2	¾	4 9/16	5½	6½	10.00

SARCO COMPANY, INC.

183 Madison Avenue, NEW YORK, N. Y.

BRANCHES IN ALL PRINCIPAL CITIES

SARCO CANADA LIMITED, Federal Building, TORONTO, ONT.

PRODUCTS

RADIATOR TRAPS
RADIATOR VALVES

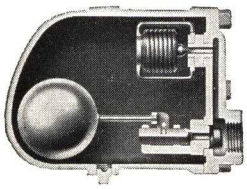
SELF-OPERATED REGULATORS
ELECTRIC HEAT CONTROLS

STEAM TRAPS
RETURN TRAPS

AIR ELIMINATORS
STRAINERS

SARCO HEATING SYSTEMS

Type H Radiator Trap



Float-Thermostatic Trap

A complete line of Specialties for Vapor, Vacuum and Gravity Steam Heating Systems and Control combined with a competent Engineering Service to architects and heating engineers to assist them in providing modern heating.

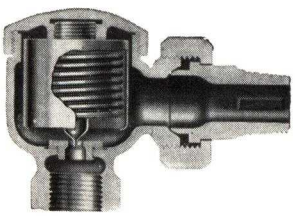
Sarco Heating Systems are "prestige Systems." The traps and valves *are* the system as far as maintenance and cost is concerned.

Sarco Type H Traps—Are available in angle, straightway, and corner patterns. The Sarco Thermostatic Bellows—made by special machinery, has not been duplicated or even imitated with success. It works efficiently, repeatedly and persistently. It has worked that way for a quarter of a century. Sizes ½" to 1".

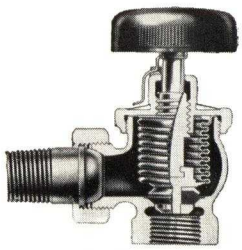
Sarco Packless Valves—Used for one and two pipe heating systems and are truly packless. Steam leaks are impossible. Furnished with round or lever handles or lock shield in angle straightway, or corner patterns. Sizes ½" to 1½".

Sarco N-100 Trap—For high pressure radiators and heating coils in stationary and marine service, and for hospital and kitchen equipment. Has full length protecting shield and stainless valve head and seat. Sizes ⅜" to 1".

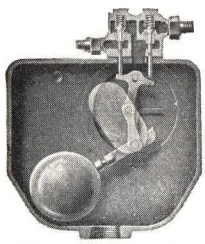
Sarco Float-Thermostatic Traps — For dripping ends of mains and risers, and for stack or blast heaters, large unit heaters and hot water generators. Automatic thermostatic air vents built in. Available in seven sizes with connections ¾ to 2 in.



N-100 Medium Pressure Trap



Bellows-Packless Valve



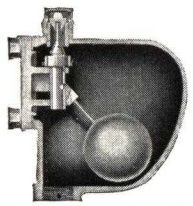
Alternating Receiver

Sarco Alternating Receiver—A complete line of boiler return traps for vapor systems.

Returns water of condensation to boiler automatically, thereby assuring positive return of water under all pressure conditions.

Made in six sizes for from 1500 to 25,000 sq. ft. of radiation.

Sarco Air Eliminators—For venting air from vapor systems at one central point in the basement. Available in two sizes: No. 6 for systems up to 2500 sq. ft. and No. 12 for 15,000 sq. ft. Both are equipped with float valves to stop water escaping through the vent and with check valves to prevent ingress of air when system is under vacuum.

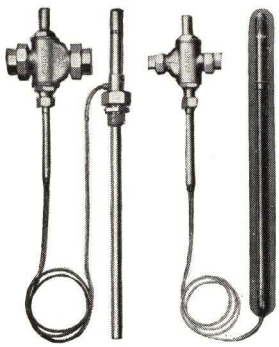


Air Eliminator No. 12

See Sarco Catalog AL 45 for all heating specialties

SARCO TEMPERATURE CONTROLS

Sarco Self-contained Temperature Regulators — Sarco Temperature Regulators are simple, self-operated valves—the only self-contained units that use the irresistible force of liquid expansion. No stuffing boxes to leak, no auxiliary "power" required; all moving parts are *inside* the equipment. Here again—a type and size for every purpose — for steam, gas, oil, water, brine or freon for temperatures ranging from 0 to 300° F.



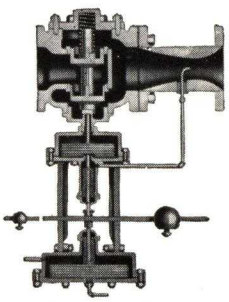
Type TR-21

Standard for hot water storage tanks, fan units, etc.

Type KR-14

Designed for room control and air conditioning

Sarco Graduator Systems—Thermostats inside and outside the building actuate the main steam supply valve according to the weather and automatic graduators are placed at the inlet to each radiator. Rapid and uniform distribution of heat is provided with savings of from 25% to 40% of the fuel. Catalog AL 128.



Graduator Valve

Sarco Water Blender

Sarco Water Blender—Mixes very hot and cold water and delivers blended water at any temperature for which it has been adjusted. Valves are fully balanced so that control is not disturbed by differing or fluctuating water pressures. Available in sizes ¾ in. to 4 in., for pressures up to 150 lbs. Catalog AL140.

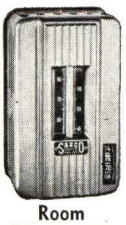
Sarco Electric Controls — When temperature control must be close, when wide and rapid fluctuations must be corrected instantly, when the thermostat is at a distance from the controlled unit; use electric regulators. Catalog AL150-1.

Water Blender

Sarco Strainers

Effective insurance against injury to traps, valves, meters, pumps, etc.

Made with screens for steam, water, oil, gas, brine or ammonia.



Room Thermostat

STERLING ENGINEERING COMPANY

Manufacturers of Steam and Water Heating Equipment

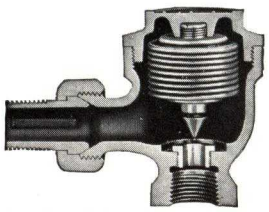
3728 North Holton Street, MILWAUKEE, WIS.

ALBANY, N. Y., Murcan Sales Corp.
ALEXANDRIA, LA., Roy Cookston
APPLETON, WIS., Htg. Prod. & Engr. Co.
ATLANTA, GA., R. L. Hicks
BOSTON, MASS., W. B. Parsons
BUFFALO, N. Y., J. A. Sullivan
CHICAGO, ILL., W. P. Nevins
CLEVELAND, OHIO, M. M. Berger and Associates
DALLAS, TEX., Paul R. Winston Co.
DETROIT, MICH., J. M. Main
DODGE CITY, KAN., C. H. Parkes
EL PASO, TEX., W. F. Lucas Engr. Co.
FORT WAYNE, IND., Domestic Sales Co.
GRAND RAPIDS, MICH., C. H. Alexander Co.
INDIANAPOLIS, IND., I. W. Cotton Co.
JACKSONVILLE, FLA., Specialty Supply Co.
KANSAS CITY, MO., Disney-Leffel Co.
KNOXVILLE, TENN., J. A. Ahler
LOS ANGELES, CAL., James G. Bain
LOUISVILLE, KY., Greene-Hogg
MINNEAPOLIS, MINN., Elliott Equipment Co.
NEWARK, N. J., George C. Alam
NEW YORK, N. Y., Crawford Engr. Co.
PHILADELPHIA, PA., Parent & Kirkbride
PORTLAND, ORE., Otto A. Cook
ST. LOUIS, MO., Russell J. Smith
SAN ANTONIO, TEX., E. H. Starr
SCRANTON, PA., John P. Gilboy Co.
SEATTLE, WASH., J. W. Mitchell
SYRACUSE, N. Y., O'Brien Specialty Co.
WASHINGTON, D. C., Clyde H. Miller Associates
WAUKEGAN, ILL., Ralph A. Nelson

SEE TELEPHONE DIRECTORY FOR LOCAL ADDRESSES

PRODUCTS

A complete line of VACUUM, VAPOR and HOT WATER HEATING SPECIALTIES, PUMPS for heating purposes, and TEMPERATURE CONTROLS, combined with competent engineering service to architects and contractors. A telephone call will bring our nearest representative to your door. For convenience our products are grouped as follows in our catalog:

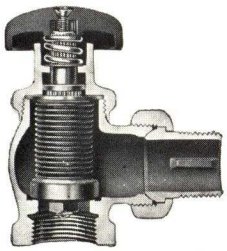


Sterling Bellows Trap No. 7

Group 1: Vacuum Vapor Heating Specialties

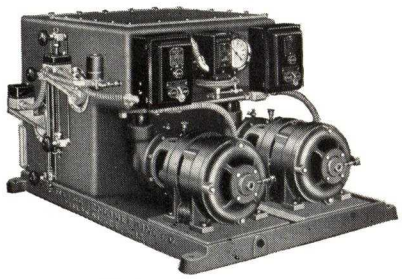
Products in this group are described in Bulletin No. 234A of the STERLING ENGINEERING COMPANY'S loose leaf catalog. They consist of:

Diaphragm type thermostatic radiator traps, bellows type thermostatic radiator traps, float and thermostatic traps, blast traps, boiler return traps, bellows packless quick-opening radiator valves, spring packed quick-opening radiator valves, vents and air eliminators, strainers, damper regulators, orifices, air line valves and pressure-vacuum gauges.



Radiator Supply Valves

Group 2: Vacuum Pumps



Duplex Vacuum Pump

Products in this group are described in Bulletin No. 372 of the STERLING ENGINEERING COMPANY'S loose leaf catalog.

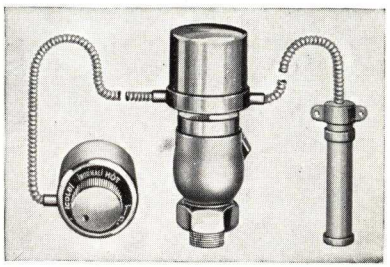
They consist of:

Return line vacuum heating pumps, condensation pump and receiver units and air line vacuum pumps.

Group 3: Temperature Controls

Products in this group are described in Bulletin No. 361 of the STERLING ENGINEERING COMPANY'S loose leaf catalog. They consist of: Type E self-contained thermostatic radiator control valves, Types G 101 to 106 remote control valves, Type F remote control valves, Type J unit heater control valves, No. 111 liquid and tank control valves and motor operated valves.

Type E Thermotrol



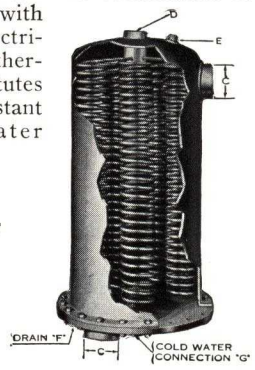
Sterling Type G Thermotrols

Group 4: Hot Water Specialties

Products in this group are described in Bulletins No. 374 and No. 271 of the STERLING ENGINEERING COMPANY'S loose leaf catalog. They consist of:

Sterling Circulators for circulating water in closed circuits, Sterling Instant Water Heaters which heat water instantaneously, using the water from the heating boiler as a heat transfer medium and Sterling No. 21 flow valves which control the flow of hot water to the heating system. The combination of these products, with the necessary electrical controls and thermostats, constitutes the Sterling Instant System of Water Heating.

Left:
Sterling Circulator



Right:
Sterling Instant Water Heater

STERLING ENGINEERING SERVICE

THE STERLING ENGINEERING COMPANY maintains direct company representatives in the cities listed above. Its representatives are engineers schooled in the technique of steam and water heating and are prepared to give technical advice and assistance to architects, engineers and contractors on the application and installation of Sterling equipment.

Write the Company at Milwaukee or communicate with our representative in your territory for a copy of our complete loose leaf catalog describing the above mentioned products in detail and giving complete information regarding their use, application and installation.

AUBURN FOUNDRY, INC.

Manufacturers of Stokers

600 West 11th Street, AUBURN, IND., U. S. A.

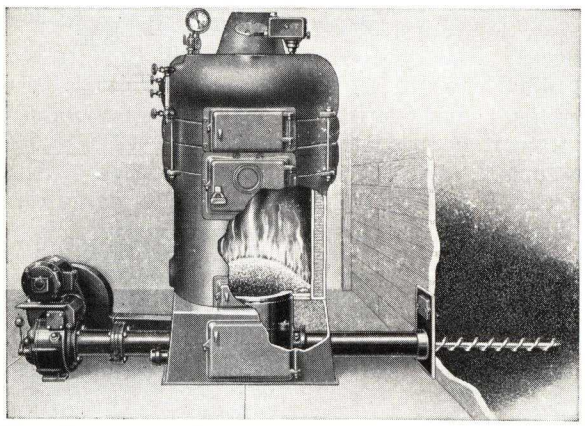
District Offices and Dealers in Principal Cities and Towns in U.S.A. and Canada, also Foreign Countries

DESCRIPTION AND APPLICATION

Auburn stokers are made in thirty-two sizes—from small domestic to 1000 boiler horsepower, both screw feed and hydraulic ram type. There are thirty years of successful combustion engineering and manufacturing experience behind the Auburn line.

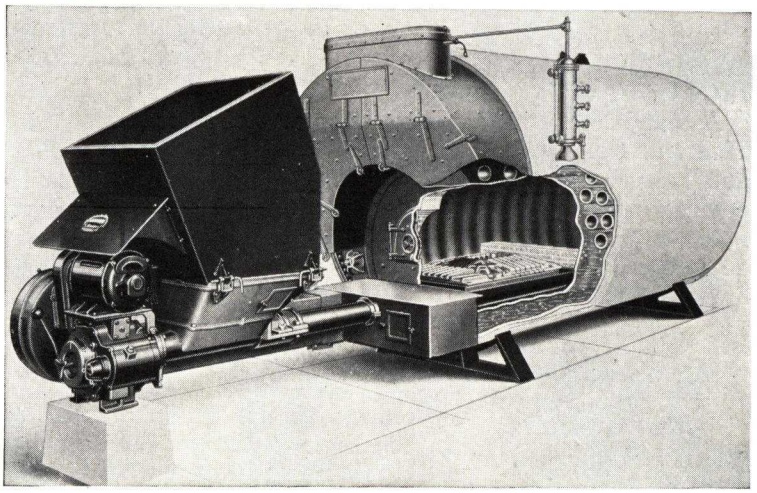
Auburn stokers are not only adapted to all types of heating and power boilers and furnaces, but special application to bake ovens, kilns, enameling ovens, dryers and foundry core ovens is also possible.

Special Bin Fed models and Bake Oven stokers are furnished only in screw type stokers.



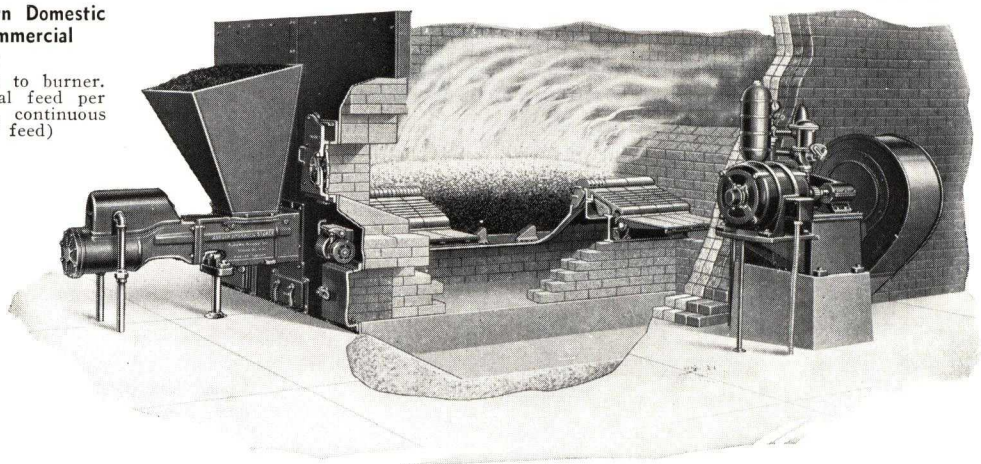
Type ALD Auburn Domestic and Small Commercial Stoker

Feeds from bin to burner. 20 to 60 lbs. coal feed per hour, two speeds, continuous gear drive (screw feed)



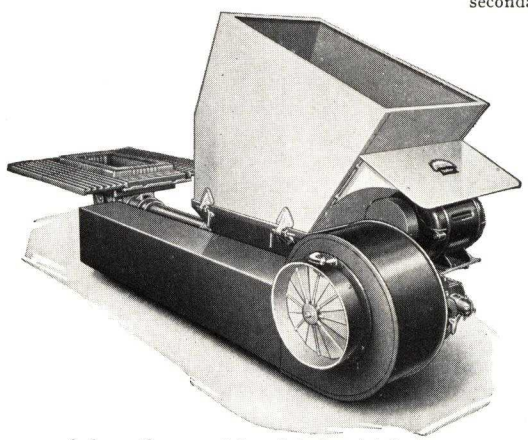
Auburn Scotch Marine Stoker

Self-contained unit, 75 to 800 lbs. coal feed per hour (screw feed)



Type SD Auburn Commercial and Industrial Stoker

Hydraulic drive, ram feed, side dump type, capacity 400 to 2400 lbs. coal feed per hour, with outside secondary pusher adjustment



Auburn Commercial and Industrial Stoker

Capacity 200 to 800 lbs. coal feed per hour (screw feed)

Type DX Auburn Domestic Stoker

18 to 35 lbs. coal feed per hour, two speed, continuous gear drive (screw feed)

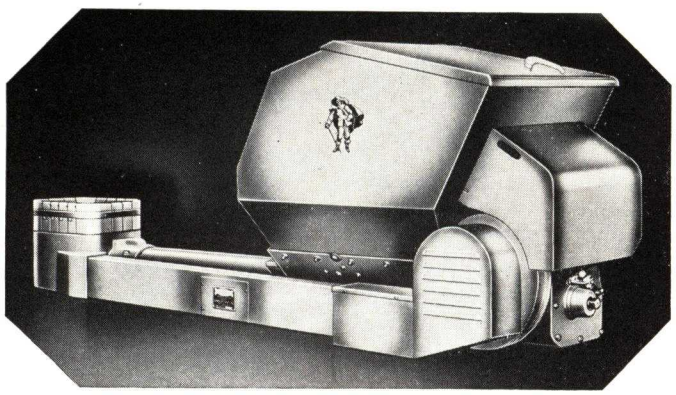
COMBUSTIONEER DIVISION

THE STEEL PRODUCTS ENGINEERING CO.

Automatic Coal Burners for Home and Industry

SPRINGFIELD, OHIO

COMBUSTIONEER Automatic Coal Burners are made in fifteen sizes to meet the requirements of every home heating plant and 90% of industrial and commercial power and heating plants.



A Domestic Model of Combustioneer

A complete automatic system of firing furnace or boiler is accomplished with the installation of COMBUSTIONEER. Coal is fed to the fire just as needed; hour after hour steam pressure or temperature is held at the desired point without worry on the part of the fireman or furnace attendant. Additional coal is fed as automatic controls indicate its need. COMBUSTIONEER is designed for every type of furnace or boiler; for steam, hot water, vapor or warm air systems.

Features

Breathing Fuel Bed
Automatic Respirator
Safety Clutch
No Shear Pins
Intermittent Feed
Quiet

Because of its underfeed method of coal burning; intermittent feed and positive controlled air supply COMBUSTIONEER may be depended upon to give highest efficiency and greatest possible economy wherever coal is burned in heating or power furnaces or boilers.

The COMBUSTIONEER Breathing Fuel Bed insures every particle of coal in the fuel bed being surrounded with the air necessary to clean, complete burning of coal.

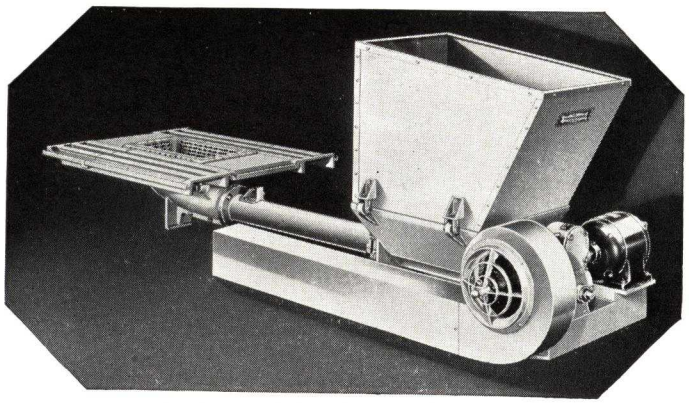
The COMBUSTIONEER Automatic Respirator automatically adjusts the air supply in exact proportion to the actual needs of the fire.

A pioneer in the industry, COMBUSTIONEER has designed and developed many of the basic principles of all successful stokers. On the market for ten years, we have an engineering department that is outstandingly successful in solving coal burning problems. A sales and service organization, that blankets the country, is prepared to render capable and prompt assistance in any problem of sales, installation or service.

More than 300,000 people, in homes and industry, are enjoying the advantages and benefits of COMBUSTIONEER. Thousands of installations in all sorts of plants prove the flexibility of COMBUSTIONEER and indicate the unusually wide range of COMBUSTIONEER applications.

The COMBUSTIONEER Bin Fed model is also available for domestic installations.

A COMBUSTIONEER Installation insures utmost efficiency; dependable service; minimum attention and desirable economy.



An Industrial Model of Combustioneer

See your local COMBUSTIONEER *dealer or write us direct for specifications and details about all models.*

DETROIT STOKER COMPANY

GENERAL SALES AND ENGINEERING OFFICES
General Motors Building, DETROIT, MICH.
DISTRICT OFFICES IN PRINCIPAL CITIES
MAIN OFFICE AND WORKS: MONROE, MICH.
Built in Canada at London, Ontario

Products and Service

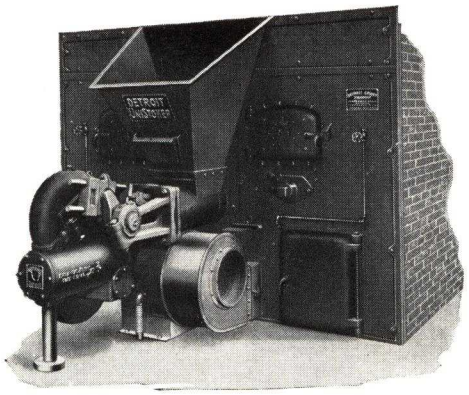
DETROIT STOKERS: Built in various types and sizes to serve heating and power boilers from approximately 30 hp. upwards. They are also used for special industrial process heating.

Bituminous coals, obtainable in all sections are successfully burned. Savings varying from 20% to 40% over other firing methods are not uncommon with Detroit Stokers. Less expensive smaller sizes of coal are used.

Since 1898

Our engineers will study your requirements. District offices, located in principal cities, will furnish catalogs of any Detroit Stoker, or write DETROIT STOKER COMPANY, Detroit, Mich.

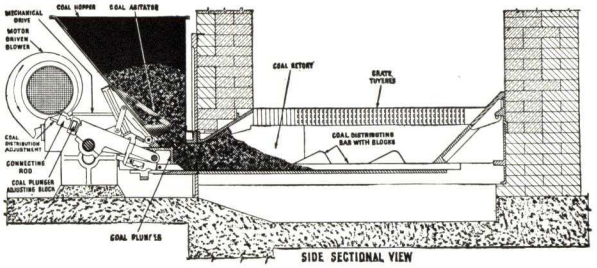
BETTER HEATING AT LOWER COST



Detroit UniStoker
Motor or Steam Turbine Driven

Detroit Single Retort and Detroit UniStoker

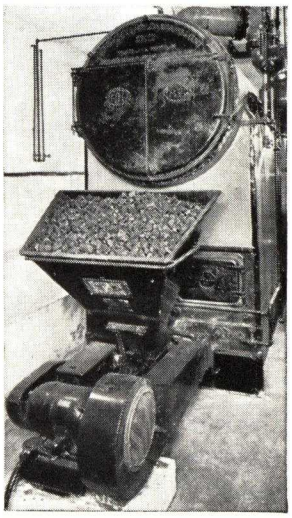
For boilers from 100 to 300 hp., mechanically driven, adjustable plunger feed, side cleaning stokers. Large active grate area with independent control of fuel feed and distribution. Write for Bulletin 660.



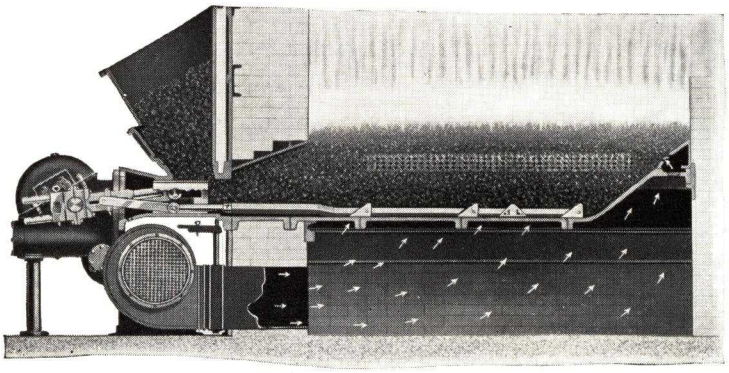
SIDE SECTIONAL VIEW

Detroit LoStoker

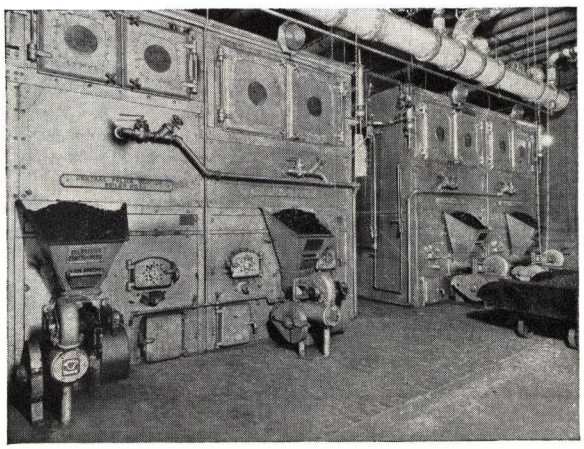
For steel firebox, tubular or cast iron boilers and small water tube boilers. Built in many sizes and capacities to fit the furnace. Adjustable plunger feed, side cleaning. Ashes are periodically dumped into pits and removed through doors provided at the front. May be driven by electric motor or steam turbine. Automatically controlled from steam pressure, water temperature or room thermostat. Plunger feed, side cleaning, air is admitted to all parts of the large active fuel bed. A great coal saver. Write for Bulletin 360.



Detroit LoStoker with High Firebox Heating Boiler

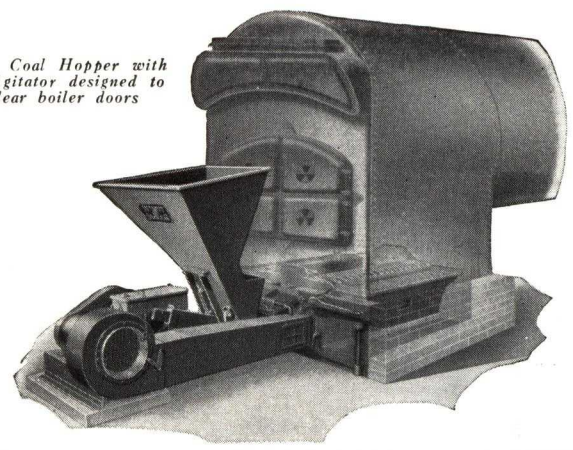


Detroit UniStoker—Side View
Arrows indicate flow of air to all parts of fuel bed



Detroit UniStokers in a Municipal Heating Plant

Coal Hopper with Agitator designed to clear boiler doors



Detroit LoStoker with Firebox Boiler Is Built to Fit the Furnace

FAIRBANKS, MORSE & CO.

MANUFACTURERS

GENERAL OFFICES

900 So. Wabash Avenue, CHICAGO, ILL.

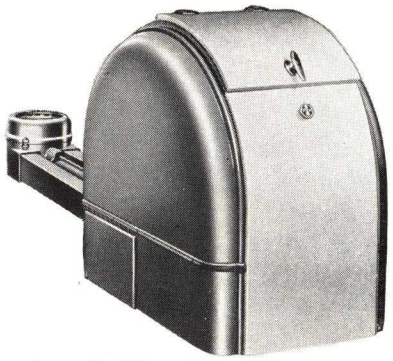
For F-M Air Conditioning Systems, see File Index

FAIRBANKS-MORSE AUTOMATIC COAL BURNERS

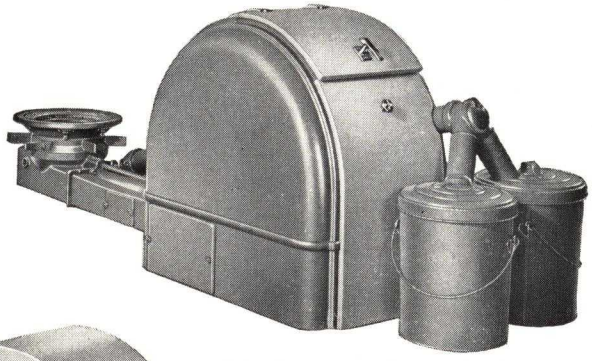
The Fairbanks-Morse complete line of Automatic Coal Burners includes models for burning anthracite as well as bituminous coal. From the smaller home requiring only 20 lbs. of coal per hour to the larger commercial installation requiring as much as 1200 lbs. of coal per hour, there is an efficient Fairbanks-Morse Coal Burner to take over the job of tending the furnace or boiler.

The F-M Coal Burner is backed by a record of successful engineering and manufacturing experience dating from 1830. It is sturdy yet simple in design and is carefully engineered to give economical service. Beautifully finished, the F-M Automatic Coal Burner has extremely reliable automatic controls and simple adjustment features.

The exclusive, patented Fire-Trol is only one of the many distinguished features in the F-M Stoker. Fire-Trol is not simply a constant air volume regulator. It automatically regulates the amount of air supplied to the fuel bed in exact accordance with the amount of air needed for maximum combustion efficiency.

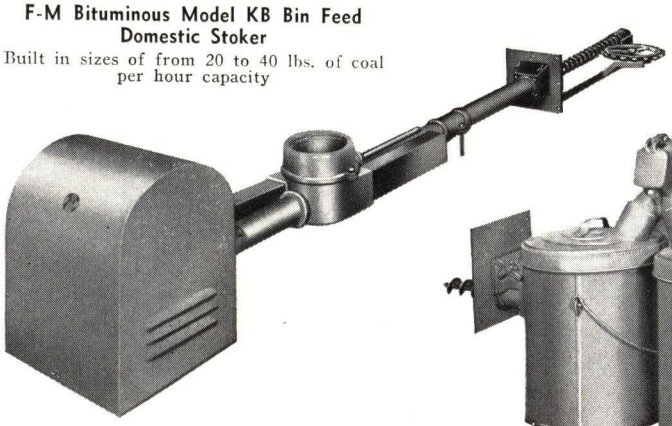


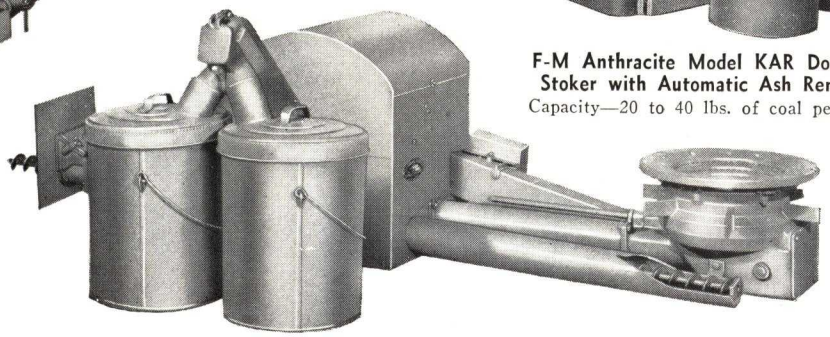
F-M Bituminous Model K Domestic Stoker
Built in sizes of from 20 to 40 lbs. of coal per hour capacity



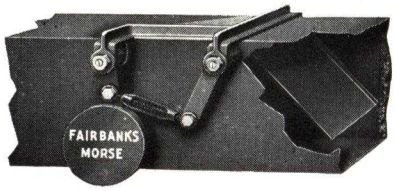
F-M Anthracite Model KAR Domestic Stoker with Automatic Ash Remover
Capacity—20 to 40 lbs. of coal per hour

F-M Bituminous Model KB Bin Feed Domestic Stoker
Built in sizes of from 20 to 40 lbs. of coal per hour capacity





F-M Anthracite Model KABR Bin Feed Domestic Stoker with Automatic Ash Remover
Capacity—20 to 40 lbs. of coal per hour



Fire-Trol, the Exclusive, Patented Fairbanks-Morse Feature Which Insures Maximum Combustion Efficiency

F-M Bituminous Commercial Stoker
Built in sizes of from 100 to 1200 lbs. of coal per hour capacity

MEMORANDA

IRON FIREMAN

AUTOMATIC COAL FIRING

For residential heating plants and for commercial heating or power boilers developing up to 500 boiler horsepower

Consult your Iron Fireman dealer for latest data

"THE MACHINE THAT MADE COAL AN AUTOMATIC FUEL"

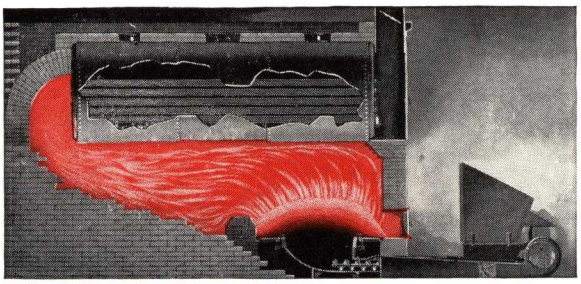
IRON FIREMAN MANUFACTURING COMPANY

CLEVELAND, OHIO PORTLAND, OREGON TORONTO, CANADA

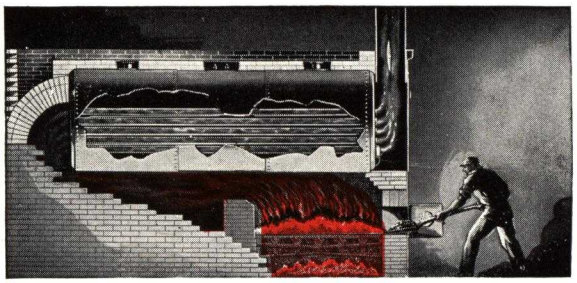
Branches or Subsidiaries: New York, Brooklyn, Chicago, Milwaukee, St. Louis, Montreal

Dealers in principal cities and towns in the United States and Canada. Representation in foreign countries

The principle of Iron Fireman "forced underfiring"



IRON FIREMAN FIRING. Small size, low cost coal **fed to the fire from below.** No smoke nuisance. No fuel waste. Steady, uniform boiler pressure, automatically controlled. Reduced labor costs.

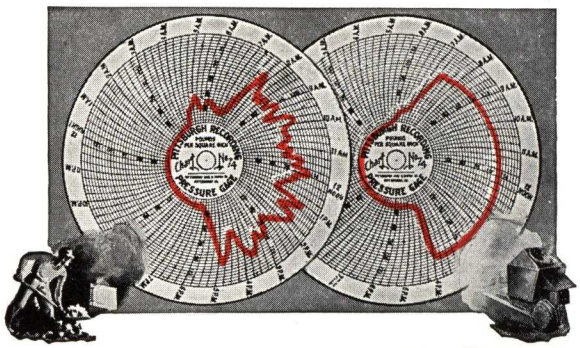


HAND FIRING. High priced coal thrown **on top of the fire.** Fuel waste from smoke and from coal that sifts through the grates, partially burned. Uneven boiler pressure. Constant labor required.

Iron Fireman "*forced underfiring*" is based on the scientific principle of feeding coal to the fire from below, under forced draft.

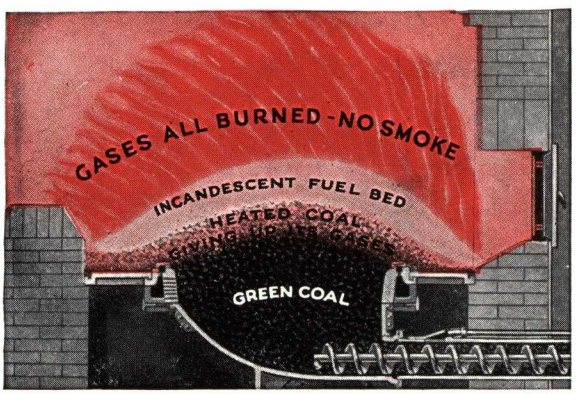
Green coal is slowly conveyed by a revolving worm from the hopper to the retort, which is directly beneath the incandescent fuel bed. The retort turns the flow of coal upward, and as the coal approaches the fire it is gradually heated. The volatile gases are distilled off in the presence of an excess of oxygen. As they pass upward through the incandescent fuel bed, they are ignited, consumed, and turned into useful heat.

The four major advantages of Iron Fireman "*forced underfiring*" are: (1) *Lower fuel costs.* Iron Fireman is especially designed to burn the smaller, cheaper sizes of coal, and to extract the maximum number of heat units per ton from the fuel. (2) *Reduced labor costs.* Iron Fireman is automatic in operation and requires but a minimum of attention. (3) *Steady, even heat or power.* Iron Fireman operates at the command of electric controls and feeds coal to the fire in just the proper amount to hold boiler pressure, or water, or room temperature, at any desired point. (4) *Eliminates smoke nuisance.* Volatile gases pass up through the fire and are thoroughly consumed.

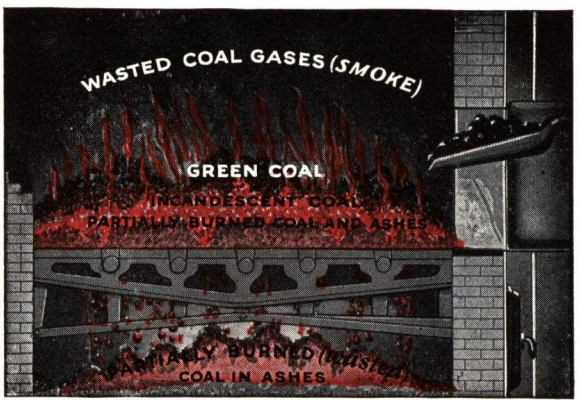


HAND FIRING
With hand firing it is impossible to maintain even heat or boiler pressure. Temperatures fluctuate widely.

IRON FIREMAN FIRING
Temperatures do not fluctuate when Iron Fireman does the firing. Heat or boiler pressure is dependable, steady.



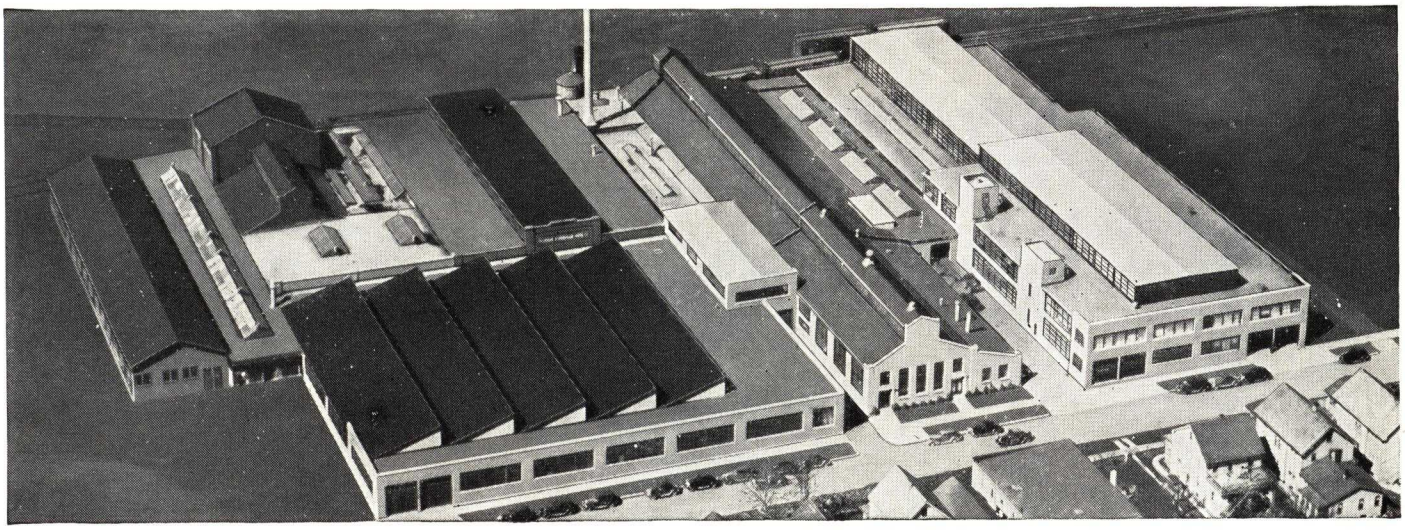
OBSERVE WHAT HAPPENS in the process of **"forced underfiring."** The feed worm forces coal upward, under the fire. Coal is slowly preheated, the gases thus released passing upward through the fire, where they are burned. Coked coal is burned when it reaches the incandescent fuel bed. No smoke nuisance. No fuel waste.



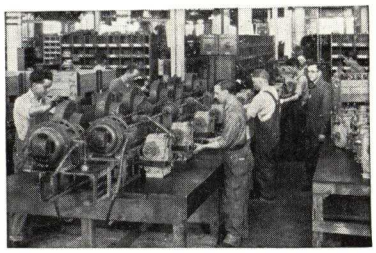
YOU SEE HERE why hand-firing is so wasteful. Green coal is thrown on top of hot fuel bed. Valuable gases are released immediately and pass up the stack unburned. Air supply is deficient. Unburned coal drops through into ash pit.

F. 4021. Copyright 1937, Iron Fireman Mfg. Co. Printed in U. S. A.

IRON FIREMEN—world's standard of stoker value



THE IRON FIREMAN PLANT AT CLEVELAND, OHIO

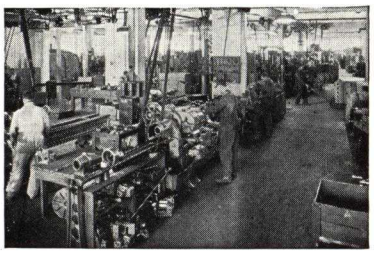


GEAR CASE TESTING DEPARTMENT

IRON Fireman Automatic Coal Burners are made in a range of sizes for heating or power boilers developing up to 500 b.hp. and for homes. They are produced by the pioneer and largest manufacturer in the field.

The IRON FIREMAN MANUFACTURING Co. has factories at Cleveland, Ohio; Portland, Oregon; Toronto, Canada. Factory branches or subsidiaries are located at New York, Brooklyn, Chicago, Milwaukee, St. Louis, Montreal. There are more than 1400 dealers in the United States, Canada, and foreign countries. A staff of factory engineers and sales representatives are maintained in the field at all times.

Reference to the commercial rating agencies or to the company's annual statement will show a well-balanced operation and obvious stability. These matters are important to the purchaser of an automatic coal burner, who has the right to know the prospects of continued service-responsibility of the maker of the equipment he buys.

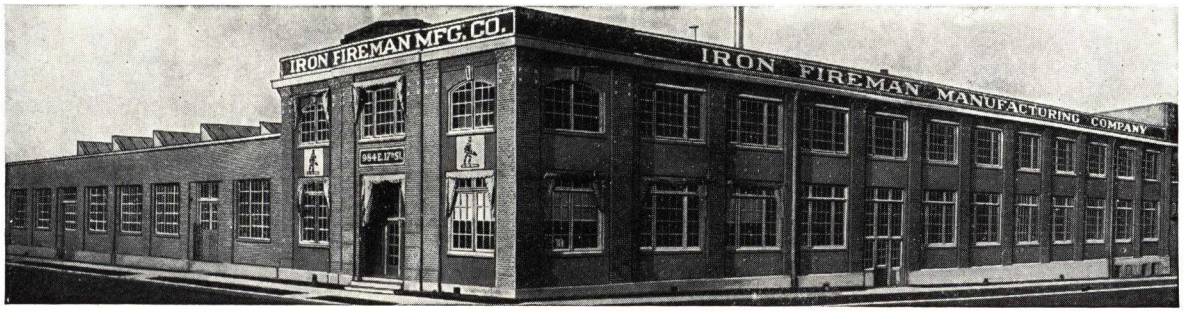


A MACHINE LINE

The Iron Fireman organization has grown to its present size and leadership through success in the invention, design, production, and sale of automatic coal burners. First to recognize the dual opportunity of improved firing results and greater firing economy in the field of automatic coal firing, this company was also the first to successfully apply these advantages. Thousands of Iron Fireman owners are now enjoying the benefits of steady, even firing, automatically controlled, and at the same time are enjoying savings over former methods which aggregate many millions of dollars annually.

The IRON FIREMAN MANUFACTURING Co. recognizes that its continued success rests upon the satisfaction of its customers and to this end spares no efforts in providing the best product which can be produced at the lowest possible cost, consistent with sound business operations, capable of insuring a continuance of service to its users.

THE IRON FIREMAN PLANT AT TORONTO, CANADA



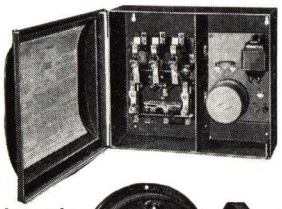
THE IRON FIREMAN PLANT AT PORTLAND, OREGON

An Iron Fireman installation provides complete firing control for homes and for commercial heating and power plants

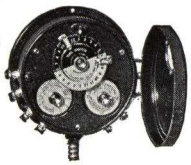
Motor Driven Relay Switch

Hot Water Regulator

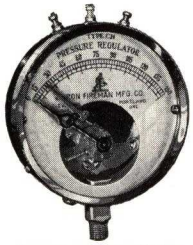
Pyrometric Controls

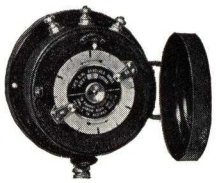

Magnetic Switch

Furnace Regulator


Time Switch

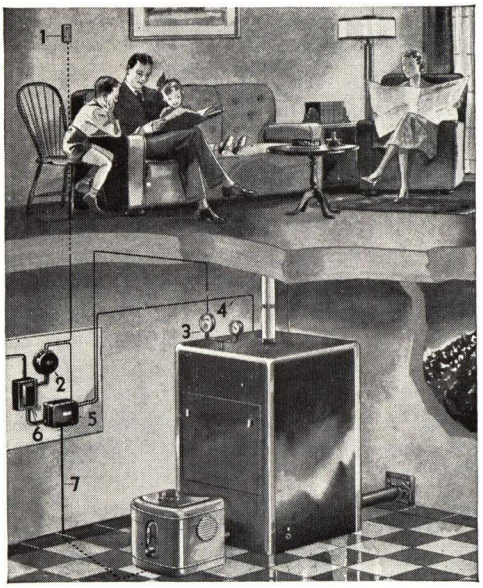
Night and Day Thermostat


Pressure Regulator


Timetactor

Plain Thermostat

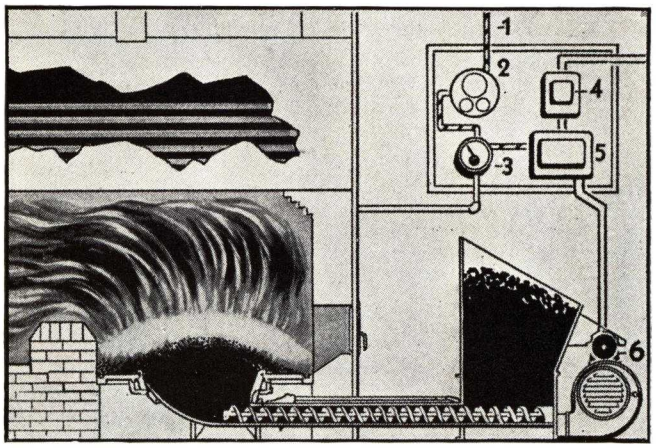
CONTROL SYSTEM ON A DOMESTIC HEATING PLANT



1. Duplex Thermostat (day and night). 2. Time Switch (day and night). 3. Pressure Regulator. 4. To Fire Detector on smoke pipe. 5. Pyrometric Controller. 6. Entrance Switch. 7. To Stoker Motor under hood.

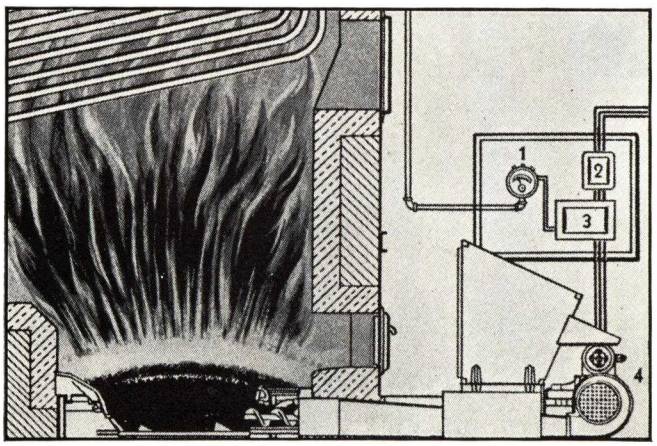
AN Iron Fireman installation is a complete automatic firing system, consisting of stoker unit and specialized controls which are carefully selected and installed in accordance with the exact requirements of each particular firing job. Temperature and steam pressure may be held at just the degree wanted —hour after hour, day after day. When the required temperature is reached, Iron Fireman banks the fire—the fire is not completely extinguished as is the case in most oil or gas burner installations. Instead, the banked, glowing coals retain heat and maintain unvarying temperature. When additional fuel is needed, controls flash the signal to the positive feed mechanism which replenishes the fire steadily and evenly. Iron Fireman heat is completely controlled heat. Controls are made for every type of plant.

CONTROL SYSTEM ON A HEATING BOILER



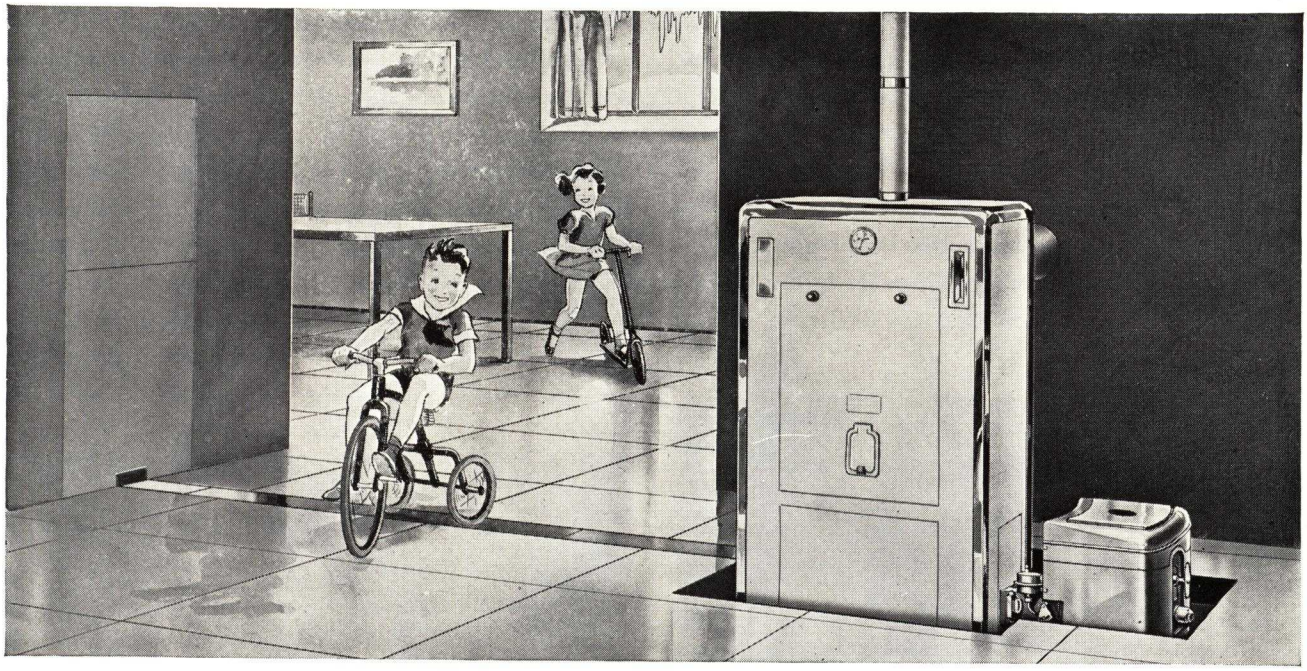
1. To Duplex (Night and Day) Thermostat. 2. Time Switch. 3. Pressure Regulator. 4. Line Switch. 5. Magnetic Switch and Relay. 6. Motor

CONTROL SYSTEM ON A POWER BOILER



1. Pressure Regulator. 2. Line Switch. 3. Magnetic Switch and Relay. 4. Motor

The Coal Flow Iron Fireman Feeds direct from coal bin to furnace

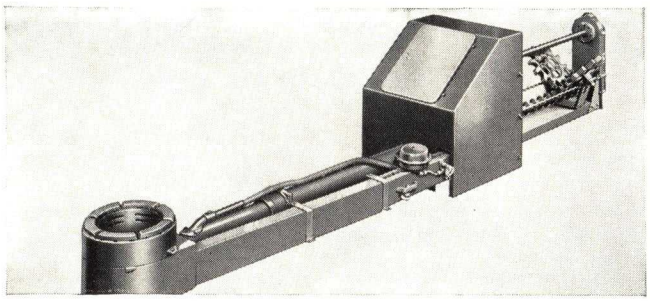


BITUMINOUS COAL FLOW MODEL

Available in various lengths up to 20 ft. Feeds coal direct from bin to fire. Models RF-20, RF-30, RF-40, RF-60. See page 5

BIN-FED models are available to fit practically every type of heating plant or basement arrangement. Coal is carried direct from main coal bin to boiler or furnace by a simple, quiet screw conveyor. Various lengths of coal conveyors are available, entering the boiler or furnace from the front, rear, side, or at an angle. This wide flexibility makes possible installations to fit the most diverse requirements. Models for domestic heating plants and for heating or power boilers.

CHAIN DRIVE COAL FLOW

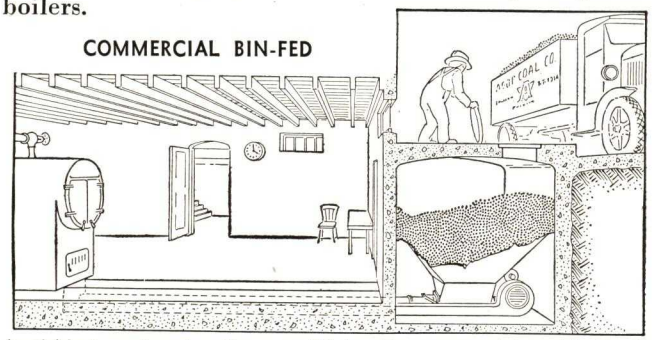


Available in various lengths up to 20 ft. For domestic models RL-20, RL-30, RL-40, RL-60. See page 5

ANTHRACITE COAL FLOW WITH AUTOMATIC ASH REMOVAL

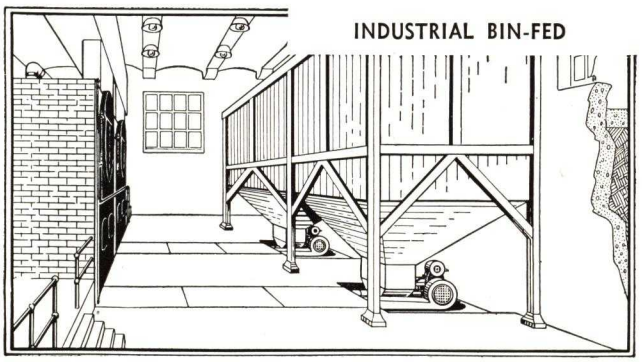
Available in various lengths up to 15 ft. Models RFAA-20, RFAA-35, RFAA-50. See page 6

COMMERCIAL BIN-FED



Available in various lengths up to 20 ft. For commercial models No. 2, No. 3, No. 4. See page 7

INDUSTRIAL BIN-FED



Available in various lengths up to 20 ft. For industrial models No. 4A, No. 5, No. 5A. See page 7. Also for Poweram models No. 4ACD, No. 5CD, No. 5ACD. See page 8

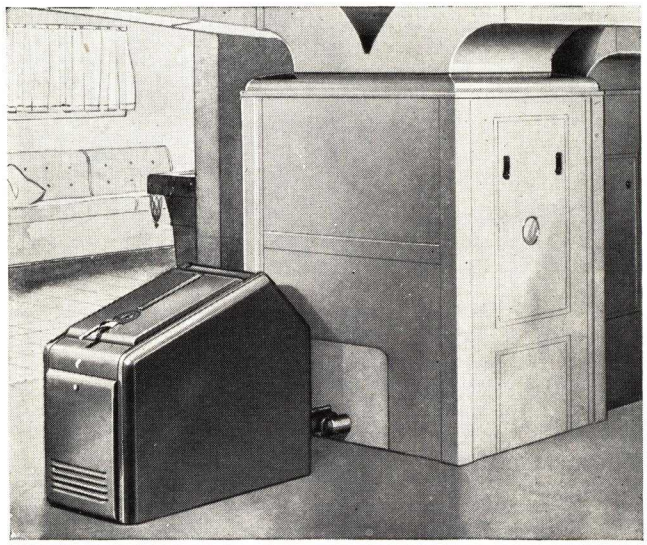
Domestic Stokers (Bituminous)

IRON Fireman is quickly installed in residential hot water, steam, vacuum, or warm air heating plants.

Installation may be made from the front, side, or rear, thus making for flexibility in setting to conform to floor plans.

These machines burn the smaller sizes of bituminous coal which are cheaper than the larger sizes used in hand-firing. A bituminous coal known in the trade as "washed pea" is recommended.

Detailed information regarding Iron Fireman automatic coal burners for residential use with bituminous coal is given in the tables below. If further facts are desired regarding any particular model or its application to a specific heating case, your Iron Fireman dealer will gladly work with you.



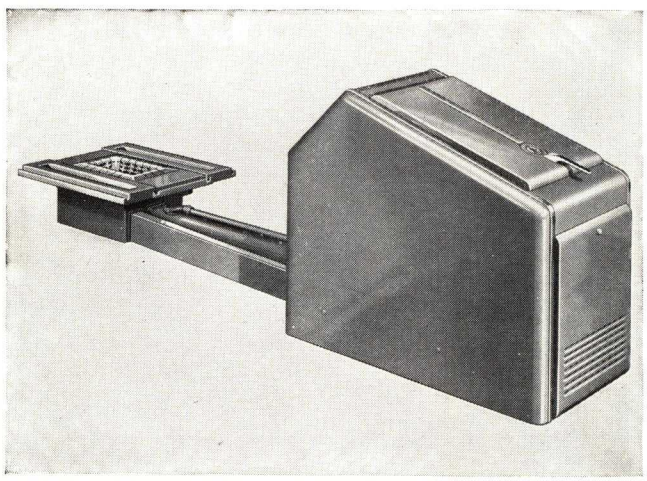
DE LUXE MODEL

RADIATION CAPACITY			
Iron Fireman Size	Warm Air Leader Pipe Area	E.D.R. Steam	E.D.R. Hot Water
DL20	1170	780	1255
DL30	1720	1145	1835
DL40	2340	1565	2507
DL60	3530	2350	3760

Maximum ratings shown are conservatively based on suitable stoker coal having a heat value of 12,500 B.t.u. per pound, as received.

OVER-ALL STOKER DIMENSIONS (ALL SIZES)

Center line of retort to extreme front	78¾ in.
Hopper height	33 in.
Max. stoker width	21½ in.



JUNIOR 100 MODEL

RADIATION CAPACITY			
Iron Fireman Size	Warm Air Leader Pipe Area	E.D.R. Steam	E.D.R. Hot Water
Junior 75	4100	2720	4350
Junior 100	5500	3670	5900
Junior 150	7800	5200	8340

Maximum ratings shown are conservatively based on suitable stoker coal having a heat value of 12,500 B.t.u. per pound, as received.

OVER-ALL STOKER DIMENSIONS

	Junior 75	Junior 100	Junior 150
Center line of retort to extreme front	80 in. short model 98 in. long model	82 in. short model 100 in. long model	85 in. short model 103 in. long model
Hopper height	39¾ in.	39¾ in.	39¾ in.
Max. stoker width	25 in.	25 in.	25 in.

Domestic Stokers (Anthracite)

IRON Fireman automatic anthracite burners are made in two types—ash-removing and non-ash-removing. Both types have been officially approved by the Anthracite Institute.

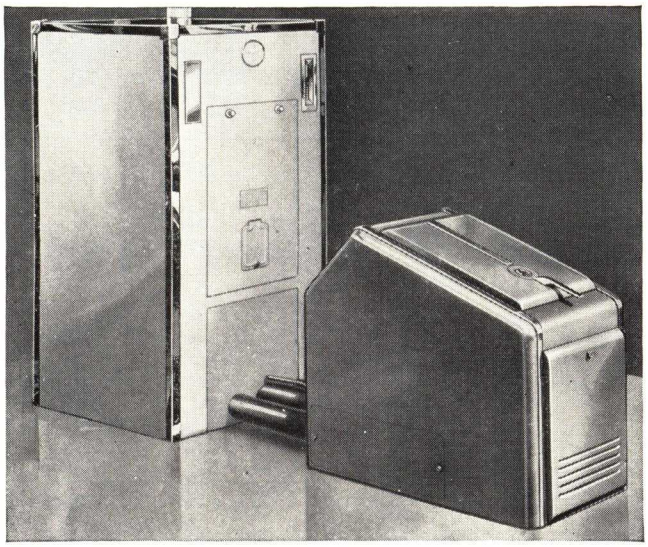
Either type is quickly installed in residential hot water, steam, vacuum, or warm air heating plants. Installation may be front, side, rear, or at an angle.

These machines have been designed for the efficient burning of those grades of anthracite coal known as Buckwheat, Rice, and Stoker Rice.

In the *non-ash-removing* Iron Fireman anthracite burner, ashes are removed from the ash pit manually at periodic intervals.

In the *ash-removing* model, ashes are removed from the furnace automatically and deposited in dust-tight receptacles.

Detailed information on both models is given in the tables below. If additional facts are desired, please consult your Iron Fireman dealer.

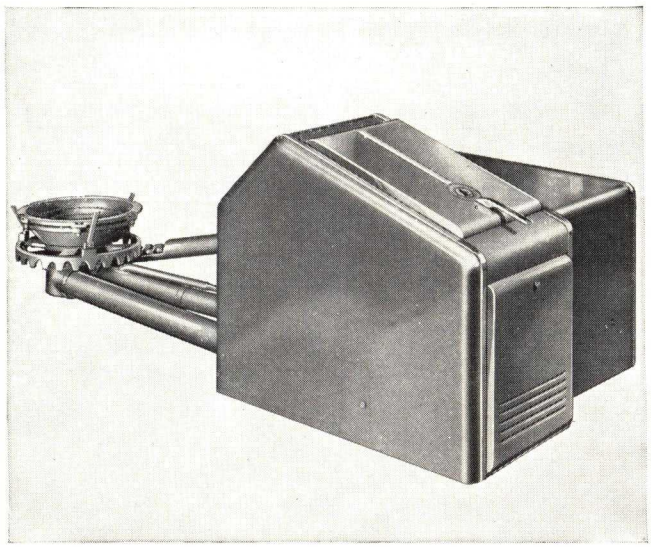


MODEL DLA (NON-ASH-REMOVING)

RADIATION CAPACITY			
Iron Fireman Size	Warm Air Leader Pipe Area	E.D.R. Steam	E.D.R. Hot Water
DLA-20	980	650	1040
DLA-35	1710	1140	1820
DLA-50	2440	1625	2600

Maximum ratings shown are conservatively based on suitable stoker coal having a heat value of 12,000 B.t.u. per pound, as received.

OVER-ALL STOKER DIMENSIONS (ALL SIZES)	
Center of retort to extreme front	78¾ in.
Hopper height	33 in.
Max. stoker width	21½ in.



MODEL DLAA (ASH-REMOVING)

RADIATION CAPACITY			
Iron Fireman Size	Warm Air Leader Pipe Area	E.D.R. Steam	E.D.R. Hot Water
DLAA-20	980	650	1040
DLAA-35	1710	1140	1820
DLAA-50	2440	1625	2600

Maximum ratings shown are conservatively based on suitable stoker coal having a heat value of 12,000 B.t.u. per pound, as received.

OVER-ALL STOKER DIMENSIONS (ALL SIZES)	
Center line of retort to extreme front	78¾ in.
Hopper height	33 in.
Max. stoker width (Including ash cans)	37¼ in.

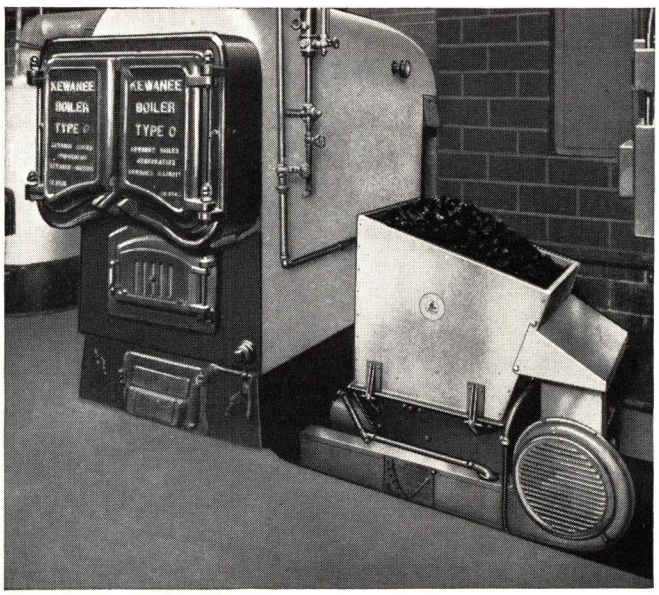
Stokers for Heating or Power Boilers up to 300 Hp.

THE IRON FIREMAN MANUFACTURING CO. is the pioneer in its field, and the largest manufacturer of stokers for heating or power boilers up to 300 hp.

The leadership of Iron Fireman in this boiler range is based on sound engineering and construction, adequate research facilities to make constant improvement in the line, a nation-wide sales and service organization, and excellent performance records in thousands of plants.

Iron Fireman commercial and industrial stokers are designed to burn efficiently the bituminous grades of coal known as Mine Run, Nut, and Slack. Installation can be quickly made.

For Commercial and Institutional Heating and Small Industrial Power



NO. 3 INSTALLATION

LOAD CARRYING CAPACITY

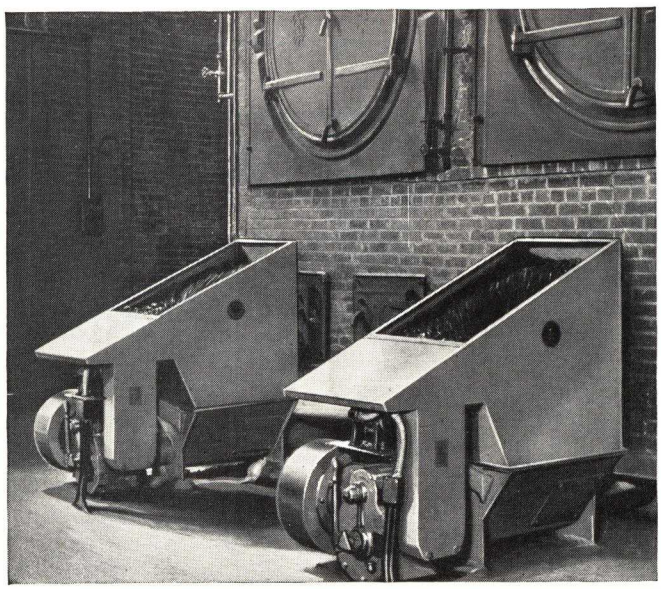
Iron Fireman Size	Heat Available at Boiler Outlet			
	B.t.u. per hour	Boiler hp.	Heating Load in Square Feet	
			E.D.R. Steam	E.D.R. Hot Water
No. 2A	1,200,000	36	5,000	8,000
No. 3 and No. 3D Poweram	1,800,000	54	7,500	12,000
No. 4 and No. 4D Poweram	2,700,000	81	11,250	18,000

Maximum ratings shown are conservatively based on suitable stoker coal having a heat value of 12,500 B.t.u. per pound, as received.

OVER-ALL STOKER DIMENSIONS

	No. 2A	No. 3 and No. 3D Poweram	No. 4 and No. 4D Poweram
Center line of retort to extreme front..	84¾ in. short model 102¾ in. long model	86¾ in. short model 104¾ in. long model	106¾ in. short model 118¾ in. long model
Hopper height.....	48½ in.	48½ in.	48½ in.
Max. stoker width...	30¾ in.	30¾ in.	30¾ in.

For Industrial and Large Heating Loads



No. 4A INSTALLATION

LOAD CARRYING CAPACITY

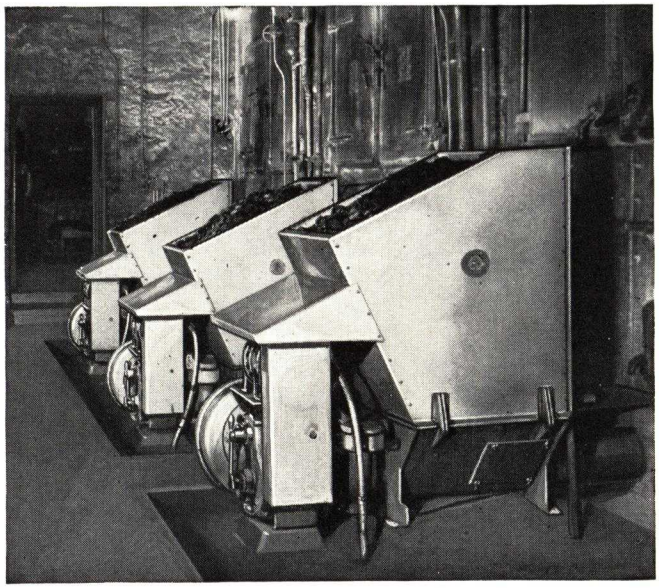
Iron Fireman Size	Heat Available at Boiler Outlet			
	B.t.u. per hour	Boiler hp.	Heating Load in Square Feet	
			E.D.R. Steam	E.D.R. Hot Water
No. 4A	4,200,000	125	17,500	28,000
No. 5	6,300,000	187	26,250	42,000
No. 5A	8,400,000	250	35,000	56,000

Maximum ratings shown are conservatively based on suitable stoker coal having a heat value of 12,500 B.t.u. per pound, as received.

OVER-ALL STOKER DIMENSIONS

	No. 4A	No. 5	No. 5A
Center line of retort to extreme front..	122¾ in. short model 134¾ in. long model	125¾ in. short model 137¾ in. long model	125¾ in. short model 137¾ in. long model
Hopper height.....	66¾ in.	66¾ in.	66¾ in.
Max. stoker width..	34 in.	36 in.	40 in.

For Heavy Duty Industrial Power and Large Heating Loads



NO. 5CD INSTALLATION

LOAD CARRYING CAPACITY				
Iron Fireman Size	Heat Available at Boiler Outlet			
	B.t.u. per hour	Boiler hp.	Heating Load in Square Feet	
			E.D.R. Steam	E.D.R. Hot Water
No. 4ACD	4,200,000	125	17,500	28,000
No. 5CD	6,300,000	187	26,250	42,000
No. 5ACD	10,000,000	300	42,000	67,000

Maximum ratings shown are conservatively based on suitable stoker coal having a heat value of 12,500 B.t.u. per pound, as received.

OVER-ALL STOKER DIMENSIONS

	No. 4ACD	No. 5CD	No. 5ACD
Center line of retort to extreme front..	126⅜ in. short model 138⅜ in. long model	128⅜ short model 140⅜ in. long model	135⅜ in. short model 147⅜ in. long model
Hopper height.....	66¾ in.	66¾ in.	66¾ in.
Max. stoker width...	34¼ in.	35¾ in.	30¾ in.

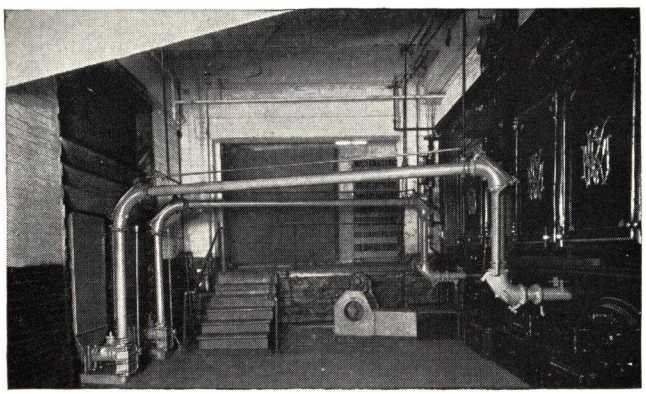
Iron Fireman Stokers for Special Applications

●

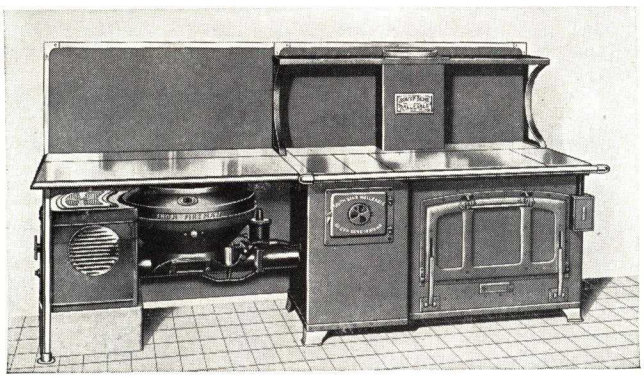
Architects will readily appreciate that an Iron Fireman stoker can be easily adapted to special applications in addition to the orthodox heating or power job in buildings, institutions, and manufacturing plants. Because of its decade of experience in making and installing thousands of stokers under varying conditions and for all types of firing jobs, Iron Fireman has met and mastered the problem of special applications. In a catalog of this nature, however, it is impossible to cover the subject at length. For information in regard to special applications, consult your Iron Fireman dealer, or write to the Iron Fireman Engineering Department (see back cover).

A partial list of Iron Fireman special applications includes: Bake ovens (food), foundry core ovens, restaurant ranges, processing pots, kilns, dryers, annealing ovens, metal pots, etc.

●



IRON FIREMAN PNEUMATIC SPREADER STOKER FOR BOILERS DEVELOPING UP TO 500 HP.

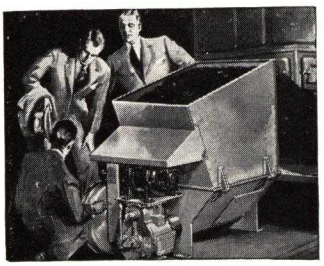


RESTAURANT: IRON FIREMAN INSTALLATION IN A COOKING RANGE

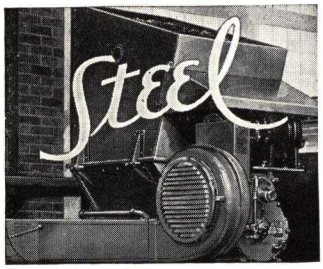
15 IRON FIREMAN FEATURES THAT

1. Balanced Design

The success of any machine is based upon the successful performance of every one of its parts. Like a chain, no machine is stronger than its weakest link. Every unit of the Iron Fireman is not only balanced and perfected in itself, but is also balanced in its relation to the other parts, and so makes the complete stoker a perfectly balanced operating unit.



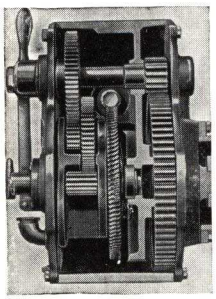
2. Pressed Steel Construction



Pressed steel construction is the accepted standard for automatic coal burners as it is for refrigerators, automobiles and Pullman cars. This construction is strong, light, durable and crack-proof, largely because of the inherent advantages of this uniform material and the method of fabrication. Iron Fireman utilizes this construction whenever possible.

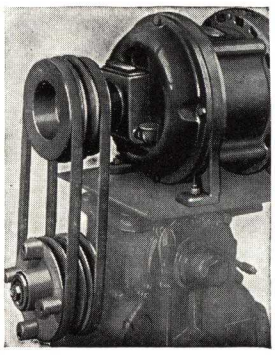
3. Iron Fireman *Transmission*

The Iron Fireman speed reduction unit and its patented speed change gears are an exclusive Iron Fireman development. This transmission drives the feed worm at a constant speed which in turn feeds the coal to the fire in a slow, steady stream at the required rate for proper burning. As a result, a steady, non-agitated fire is obtained. This transmission has three speeds and three neutrals. The gears can be shifted while the stoker is in operation; in fact more easily than when the stoker is idle, and it is impossible to strip the gears while shifting. All the gears operate in a bath of lubricating oil and the unit is most quiet. In design, materials and precision of construction, the Iron Fireman transmission is like that of a fine automobile.



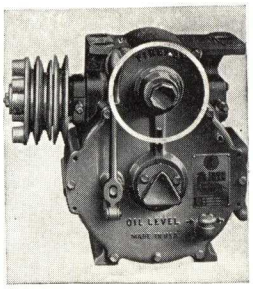
4. Duo-Purpose "V" Belt Drive

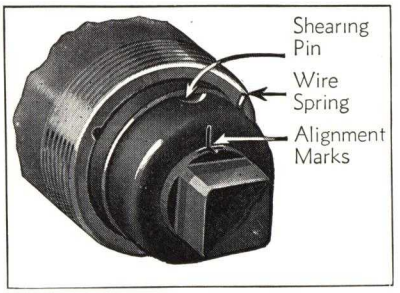
V-belt drives are the latest development in power transmission and they have many desirable qualities. They combine flexibility with ease of alignment, freedom from vibration, long life, and quiet operation. Iron Fireman uses this type of drive to obtain these desirable results and most models make use of an added V-belt application. They are equipped with two belts; one to drive the transmission and one to drive the fan, which rotates on ball bearings, independent of the main drive shaft. This makes a very flexible additional application, since the fan can thus be run at a speed independent of that of the feed worm transmission, and its air output can be exactly balanced to the amount of coal consumed.



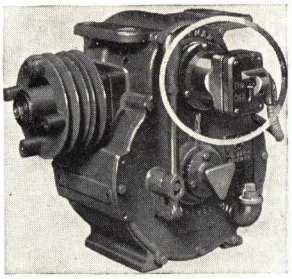
5. Safety Overload Device

Emergencies occasionally arise when an overload device is needed on a stoker; a railroad spike is sometimes thrown into the coal reservoir with the coal, finds its way into the feed worm, and may become lodged at the entrance to the worm housing. In such cases a safety shear pin automatically shears, thus giving positive protection to the stoker mechanism. It is a simple matter to remove the railroad spike or other foreign object on the rare occasions when it gets into the coal supply. The safety shear pin serves the same basic purpose as the ordinary fuse plug in an electrical circuit and it is just as easy to replace. While this simple overload device may never be needed, it continually stands guard against costly breakage and resulting boiler shutdown.



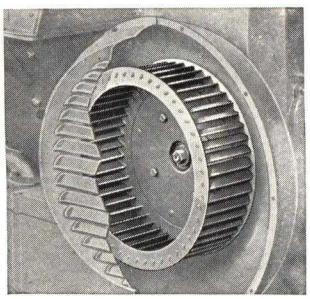


6. Shear Pin Alarm



For hospitals, greenhouses, or other applications where immediate attention must be called to an interruption of the fuel supply. When such interruption occurs, the shear pin alarm will stop the stoker and hold the fuel bed ready for service resumption announcing the emergency with bells or lights.

7. Centro-Balanced Rotor Fan



Air is supplied to the fire by a highly efficient centro-balanced rotor fan, especially designed by Iron Fireman engineers and produced in the Company's own plant. It is accurately balanced to eliminate vibration and is compact, durable and quiet in operation. The fan is inclosed in the pressed steel fan housing designed and made by Iron Fireman exclusively for Iron Fireman fans.

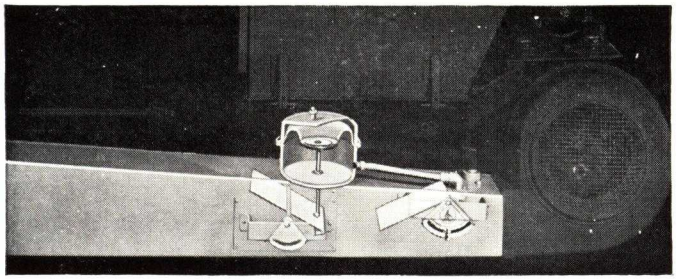
8. Automatic Fire Banking Damper

Located in the steel air duct, through which air moves from the fan outlet to the air chamber, is a device somewhat similar to a check valve. This acts as an automatic fire banking damper. When the stoker is in operation, this damper is held open by the flow of air, but automatically closes the air passage when the stoker stops. It thus holds the fire in the proper condition for good combustion when heat is again required, and between periods of operation conserves fuel by allowing the burning of only a minimum amount of coal in the banked fuel bed.

INSURE DEPENDABLE AUTOMATIC FIRING

9. Iron Fireman *Volumeter*

Automatic control of air volume in the combustion zone is obtained with the Iron Fireman Volumeter. Regardless of fuel bed conditions or the type of coal used, the Volumeter supplies exactly the amount of air needed for perfect combustion.

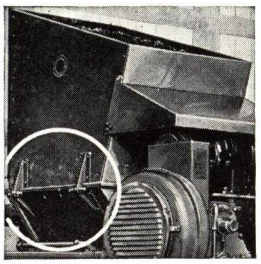


10. *Pneumatic Fume Eliminator*

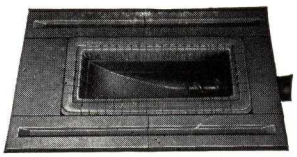
A small air intake is placed in the fan casing at the point at which the air leaves the fan with the greatest velocity. A small air duct connects this intake to an air injector placed at the firebox end of the worm housing. This device insures a stream of high pressure air flowing into the worm housing at all times, and thereby creates a positive movement of coal fumes through the fuel in the bottom of the retort. It prevents any fumes from flowing back through the worm housing to the fuel reservoir, thence into the furnace room.

11. Iron Fireman *Coal Reservoir*

The Iron Fireman coal reservoir is made of heavy gauge steel plate. It is scientifically shaped to facilitate free flow of coal to the feed worm. On the larger sizes, these reservoirs are attached by specially designed hinges. These hinges enable the coal reservoir to be quickly and easily removed or, should occasion arise, to be easily swung to one side or the other. On the domestic and smaller commercial models a gas-tight, dust-tight top is available for installations where extreme cleanliness is a factor.

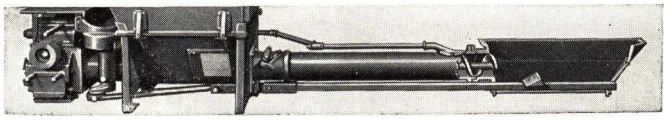


13. Iron Fireman *"Carburetor"*



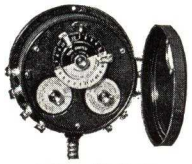
The retort, venturi tuyeres and dead plates constitute the "carburetor" of the Iron Fireman. Within this carburetor, coal and air meet and are mixed in the proper proportion to obtain efficient combustion when they enter the heat zone. In this part of the stoker, design, material and construction meet the acid test. The retort on the larger sizes is made in sections which are especially designed to allow for differences in expansion due to heat. All of these parts are the result of years of development work by Iron Fireman engineers in the laboratory and in the field.

14. Iron Fireman *Coal Distributor*



The kind of coal used or the kind of load to which Iron Fireman is applied may require a slightly agitated, evenly distributed fuel bed low in height. The heavy duty Iron Fireman fulfills this requirement without sacrificing the large hopper and compact mechanism features for which Iron Fireman is famous. After the feed worm conveys the coal to the retort, the auxiliary mechanism distributes the coal uniformly into the combustion zone.

15. Iron Fireman *Automatic Controls*

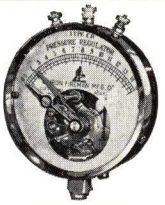


Time Switch

Night and Day Thermostat

SYNCRO-STAT

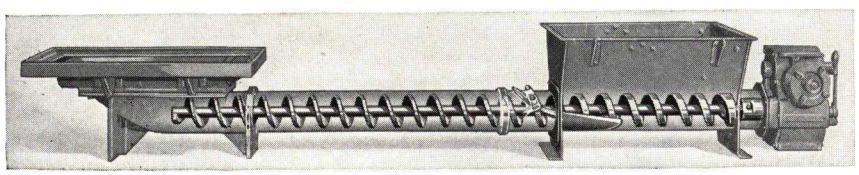
TIMETACTOR



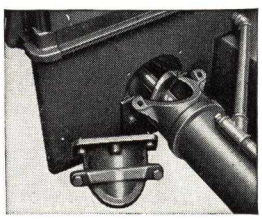
PRESSURE REGULATOR

With sensitive, accurate, automatic controls, Iron Fireman operation is closely governed to the time, temperature, or pressure requirements of the load it is serving. Because Iron Fireman pioneered this field, Iron Fireman first encountered the peculiar requirements of automatic firing control. Now many necessary control features are patented to Iron Fireman exclusive use.

12. Iron Fireman *Conveyor Screw and Worm Housing Cleanout*



The conveyor screw is made of a special heat-resisting alloy steel by an exclusive Iron Fireman process. A one-piece pattern is used which is screwed out of the sand as a bolt is screwed out of a nut. Consequently, it is as true in size and shape as a fine carpenter's bit. The strength of the screw is far in excess of any working requirement. The worm flights and core are scientifically designed to feed coal evenly and with a minimum expenditure of power.



Foreign matter which may find its way into the coal and obstruct the operation of the stoker is led up to the worm housing cleanout, from which position it can be readily removed without damage to the stoker or delay to the operation.

IRON FIREMAN

IRON FIREMAN ENGINEERING SERVICE

The material in this catalog on Iron Fireman stokers for residential heating, commercial and industrial heating or power, and special applications is of necessity somewhat general in nature. However, it should prove to be sufficiently comprehensive to enable the architect to identify the model that seems best suited to fit his particular needs.

Where this catalog stops, Iron Fireman Engineering Service begins. This service is nationwide in scope and is available through the hundreds of factory-trained dealers who are located in all principal cities in the country. This service is at your disposal. It represents the experience and practical heating information gained through servicing thousands of boiler rooms and heating plants in all parts of the country.

In addition to the field engineering organization of Iron Fireman dealers, the services of specially trained factory engineers are available. They are equipped to furnish you counsel and detailed information that will result in your securing an installation that will give maximum performance and years of trouble-free service. The services of these men can be secured without cost or obligation. Address the nearest Iron Fireman factory. Iron Fireman Manufacturing Company, Cleveland, Ohio; Portland, Oregon; Toronto, Canada.

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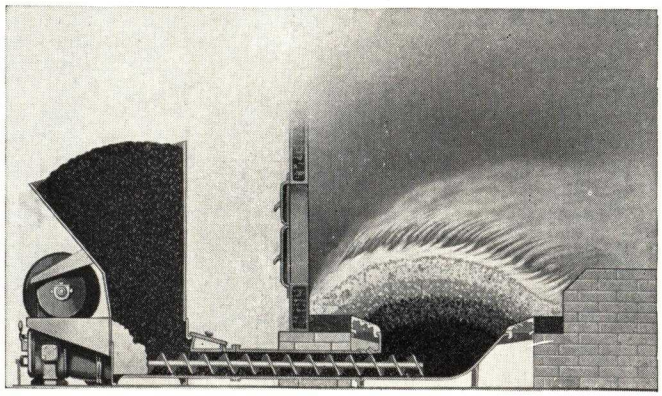
See Sweet's Catalog File—Engineering—for detailed information on Iron Fireman models for commercial and industrial heating and power applications

LINK-BELT COMPANY

STOKER DIVISION

CHICAGO, ILL., 2410 W. 18th Street — PHILADELPHIA, PA., 2045 W. Hunting Park Avenue
DETROIT, MICH., 5938 Linsdale Avenue
In Canada: JAMES ROBERTSON CO., LTD., Toronto, Montreal, Winnipeg, St. John

INDUSTRIAL STOKERS



Link-Belt Stoker with Power-Flex Head

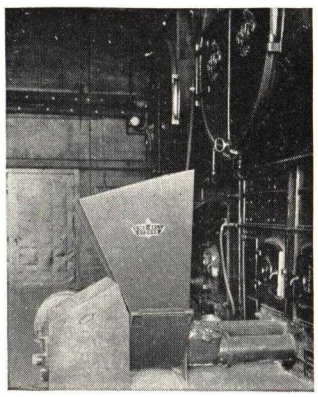
Developed by Link-Belt Engineers out of long experience on large power plant equipment, and proved by many years' actual operating service, the Link-Belt Power-Flex stoker saves up to 45% in fuel costs plus other operating advantages.

For Heating—Apartments are more attractive to tenants because of uniform and adequate heat—rooms that never could be heated are made rentable—there is no smoke—no fire or explosion hazard—no oil burner smudge—no need for coal dust—the janitor is released for productive work around the building.

For Process Steam—Link-Belt stoker firing eliminates steam pressure fluctuations—often requires the use of only one boiler instead of two hand fired—releases the attendant for productive work.

The fuel savings (up to 45% over hand firing; 50% to 75% saving over oil and gas, in most localities) with which the Link-Belt equipment pays for itself and dividends thereafter, are made possible by the fact that Link-Belt stokers are flexible enough to handle the lower cost coals. In Chicago, for example, they burn Illinois or Indiana coals—as against higher priced Kentucky coals required by conventional stokers for high efficiency.

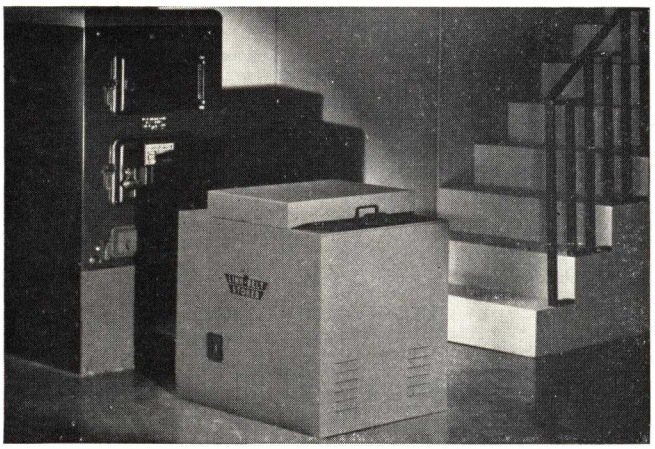
The Power-Flex Burning Head—No dead plates are used. The tuyeres are made up of thin laminated sections; greater air-cooled area eliminates warpage; slag drainage adequately provided for; more active coal burning area.



Other Features—Air-Meter on most sizes — variable intermittent drive — Load Signal automatic cutout—chrome iron firebox parts. All sizes up to 300 b. h.p.

RESIDENTIAL STOKERS

A decided swing towards the use of automatic coal firing for home heating is in progress, for these reasons: the fuel saving is sufficient to more than repay the cost of the stoker during its life—the heat is uniform—no "layer-cake" heating, with cold floors, as with types of burners that pop on and off; there is no vapor smudge, no smoke, no dust or dirt; fire and explosion hazard is done away with; the housewife never needs to touch the heating plant—the man of the house does not have to tend the fire in the morning, or several



Link-Belt Bituminous Stoker, Hopper Type

times during the evening; once a day, when convenient, is all the attention required—and this is amply repaid by the advantages secured.

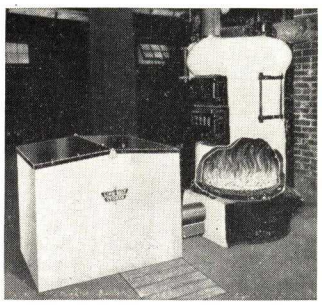
Link-Belt Features—The Link-Belt automatic bituminous stoker has the Air-Meter automatic air control, variable intermittent drive, Load-Signal automatic cutout and buzzer, sectional retort, all firebox parts chrome iron, anti-riddling air ports, easily accessible cleanouts; soundproofed against noise, full set automatic electric controls. Available in 5 domestic sizes from 30 lbs. per hour up.

Bin-Fed and Anthracite Stokers

Bituminous home stokers are available in universal-type bin-fed models, with special Link-Belt features.

Link-Belt anthracite stokers are available in bin-fed and hopper types, with a choice of three methods of ash removal. All domestic and small commercial sizes.

Link-Belt Features—Patented ash sweeper ring, phosphor bronze plunger type coal feed—plunger type ash removal — segmental overlapping tuyeres, with tangential, self-cleaning air ports—bucket type ash elevator.



Anthracite Stoker

MOTORSTOKOR DIVISION

HERSHEY MACHINE & FOUNDRY COMPANY

MANHEIM, PA.

Installed and Serviced by Factory Trained Dealers in Principal Cities

MOTOR STOKOR

Description

An underfeed, screw type stoker for buckwheat or rice anthracite. Models for small and large homes, as well as apartment houses, hotels. office and factory buildings. Attractive. modern, streamline design. Bin or hopper feed, ash-removal or pit type. Equipped with Minneapolis-Honeywell controls for start and stop operation. The standard set of controls can be used for supplying year-round domestic hot water.

Application

Available in 7 models and in units from 8 to 60 tons per season. Adaptable to steam, vacuum, water or warm air systems. Many semi-commercial uses, apartment houses, factories, bakeries, etc. Can be installed in oil and gas boilers. Capacities for anthracite of almost double any other make approved by Anthracite Industries, Inc., Laboratories.

Features of Design

General
Complete, sturdy and rugged.
Oilless bearings throughout.

Bin-to-Burner Models
Feeder operates continuously while stoker is in operation.
Universal (except 5AF models)—fuel may be picked up from any direction.
Exposed section of pick-up screw in bin 41¼ in.—no bearings in coal bin.
Provided with suction from air intake for dustless operation.

Hopper Models
Hoppers made of cast iron $\frac{3}{16}$ in. thick.
Suction to permit dustless filling.

Motor
Flexible mounting.
Fully enclosed.
Built-in overload protection.

Fan
Pressure type, self-compensating (eliminating necessity of special regulators).
Quiet.
Mounted on motor shaft—no couplings.

Coal Feed
Heavy fabricated chrome-moly screws.
Screws easily removed.
Floating screws.
Erosion-abrasion resistant and ventilated coal tube.
Jerkless, even feed.

Main Drive
V-belt drive with positive tension.
Automatic release clutch and current cut-off.
High speed gears and bearings submerged in oil.

Burner
Concentric dustless ring grate—no cleaning necessary.

Ash System
Positive clinker breaker—revolving clinker bar.
Monel shafts.
Multi-can discharge.

Controls
Intermittent thermostat operation.

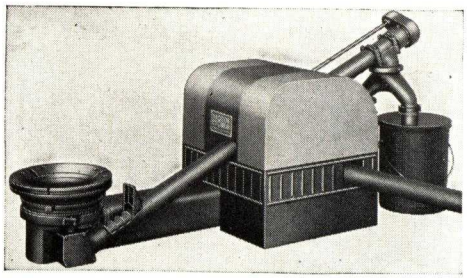
MODEL SPECIFICATIONS

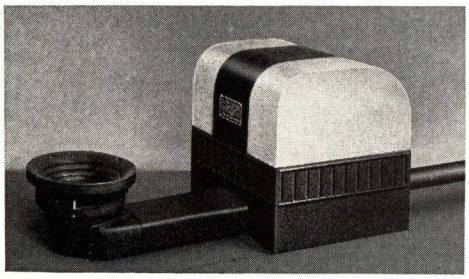
Model—last number indicates rating in pounds fuel burnable per hour	Max. rating sq. ft. E. D. R. steam or vapor (see note)	Max. rating sq. ft. E. D. R. water (see note)	Dia. of burner in.	Burner clearance req'd in.	Recommended clearance top of burner to crown sheet, in.	Height of burner in.	Motor H.P.	Max. length feeder center bin to center of boiler ft.–in.	Hopper holds lbs.	Ash capacity cans
2AF20	640	1020	13	15	20	11½	⅙	29	.....	2 to 7
30	850	1360	15	17	23	12½	⅙	29	.....	2 to 7
40	1100	1760	17	20	26	12½	⅙	29	.....	2 to 7
50	1450	2320	17	20	26	12½	¼	29	.....	2 to 7
65	1800	2880	20	25	30	15	¼	29	.....	2 to 7
85	2450	3920	24	29	36	16½	¾	29	.....	2 to 7
100	2800	4480	24	29	36	16½	¾	29	.....	2 to 7
2AH20	640	1020	13	15	20	11½	⅙	.....	450	2 to 7
30	850	1360	15	17	23	12½	⅙	.....	450	2 to 7
40	1100	1760	17	20	26	12½	⅙	.....	450	2 to 7
50	1450	2320	17	20	26	12½	¼	.....	450	2 to 7
65	1800	2880	20	25	30	15	¼	.....	450	2 to 7
85	2450	3920	24	29	36	16½	¾	.....	750	2 to 7
100	2800	4480	24	29	36	16½	¾	.....	750	2 to 7
3AF20	640	1020	13	20	20	11½	⅙	29	.....	PIT
30	850	1360	15	22	23	12½	⅙	29	.....	PIT
40	1100	1760	17	25	26	12½	⅙	29	.....	PIT
50	1450	2320	17	25	26	12½	¼	29	.....	PIT
65	1800	2880	20	28	30	15	¼	29	.....	PIT
85	2450	3920	24	36	36	16½	¾	29	.....	PIT
100	2800	4480	24	36	36	16½	¾	29	.....	PIT
3AH20	640	1020	13	20	20	11½	⅙	.....	450	PIT
30	850	1360	15	22	23	12½	⅙	.....	450	PIT
40	1100	1760	17	25	26	12½	⅙	.....	450	PIT
50	1450	2320	17	25	26	12½	¼	.....	450	PIT
65	1800	2880	20	28	30	15	¼	.....	450	PIT
85	2450	3920	24	36	36	16½	¾	.....	750	PIT
100	2800	4480	24	36	36	16½	¾	.....	750	PIT
5AF20	640	1020	13	20	20	11½	⅙	27–3	.....	PIT
30	850	1360	15	22	23	12½	⅙	27–3	.....	PIT
40	1100	1760	17	25	26	12½	⅙	27–3	.....	PIT
50	1450	2320	17	25	26	12½	¼	27–3	.....	PIT
65	1800	2880	20	28	30	15	¼	27–3	.....	PIT
8AF20	640	1020	13	15	20	11	⅙	27–3	.....	2
30	850	1360	15	17	23	12½	⅙	27–3	.....	2
40	1100	1760	17	20	26	12	⅙	27–3	.....	2
9AF20	640	1020	13	20	20	11	⅙	27–3	.....	PIT
30	850	1360	15	22	23	12½	⅙	27–3	.....	PIT
40	1100	1760	17	25	26	12	⅙	27–3	.....	PIT

Note: Choose next larger size when within 20% of rating. It is sound engineering to over-stoker.

Series 8AF. Universal Bin Feed with Ash Removal

Series 9AF—Universal Bin Feed Without Ash Removal.

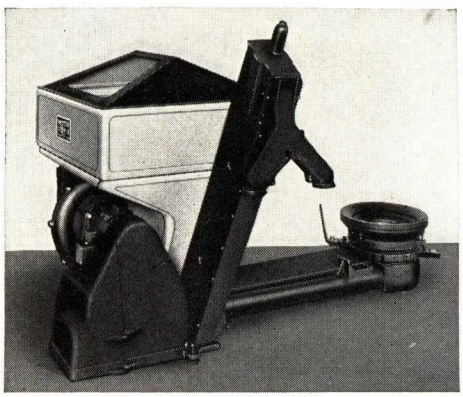


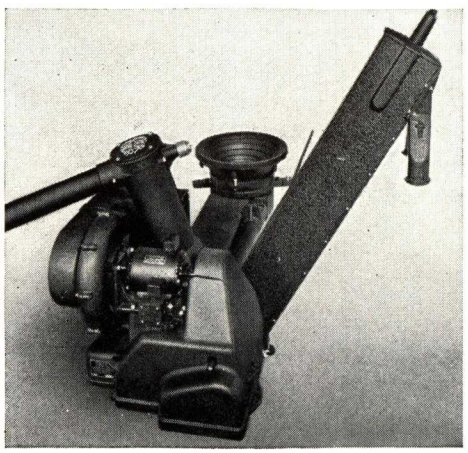


Series 5AF. Straight Line Bin Feed without Ash Removal

Series 2AH. Hopper Feed with Ash Removal

Series 3AH—Hopper Feed Without Ash Removal.





Series 2AF. Universal Bin Feed with Ash Removal

Series 3AF—Universal Bin Feed Without Ash Removal.

VICTOR ELECTRIC PRODUCTS, INC.

750 Reading Road
CINCINNATI, OHIO

VICTOR COMPANIES AND WAREHOUSES IN ALL PRINCIPAL CITIES

VICTOR IN-BILT VENTILATORS

The DeLuxe **VT28 VT28X**

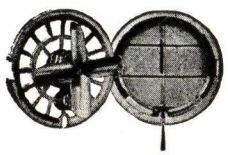
The Victor DeLuxe is the "king" of all ventilators. It has an attractive aluminum grille that blends with any kitchen decorative scheme and a triple outside shutter construction that provides a neat, weatherproof exterior appearance. The powerful 12-in. fan exhausts over 800 cu. ft. of free air every minute. This means a complete change for the average kitchen every 1½ to 2 minutes, assuring thorough ventilation and the elimination of all grease and cooking odors. Its motor operation is automatic with the opening and closing of the shutters, being controlled by the nickel-silver bead chain.

The Master **VS32 VS33**

The newest Victor In-Bilt. Designed particularly for *small homes, apartments and bathrooms,* it has many of the features of the DeLuxe and moves 400 cu. ft. of free air per minute. Its compact design permits its use in limited space areas, over windows, through shallow cabinets, etc. It has a one-piece, streamlined shutter that seals tightly against the outside panel when closed, plus a rain sill which prevents the leakage of moisture into the wall.

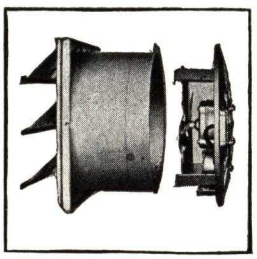
The Special **VS30 VS31**

This Victor In-Bilt is for the average sized home. It moves 600 cu. ft. of free air a minute with absolute quietness which is ample to not only exhaust kitchen odors quickly, but also provide adequate ventilation for the entire first floor. Its one-piece, rustproof louvre, streamlined to eliminate any resistance, seals tightly upon a weatherproof felt when closed. The Victor Motor is equipped with a one-shot oiler which is easily accessible.



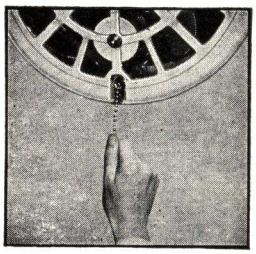
Easy to Clean

The telescopic sleeve construction of all Victor In-Bilts makes for easy installation in any type or thickness of wall. It also adds efficiency to the fan as there are no corners to pocket air and, likewise, there are no corners to pocket grease, thus making cleaning effortless.



Telescopic Sleeve Makes Installation Easy

The automatic operation of Victor In-Bilts is a feature appreciated by the housewife. To start the fan and open the shutter, the chain is released from its catch. The shutter opens under spring tension and the motor starts. This feature eliminates the use of rods which often become lost rendering the fan practically useless.



Automatic Operation

	VT 28 VT 28X	VS 30 VS 31	VS 32 VS 33
Blades (quiet)	12-in. diameter	10-in. diameter	8-in. diameter
Capacity	800 c.f.m.	600 c.f.m.	400 c.f.m.
Interior Grille	15¼-in. diameter	12-in. diameter	11½ in. diameter
Outside Panel	15⅜x15⅜ in.	12½x12½ in.	10¼x10¼ in.
Wall Opening	14-in. diameter	11¼ in. diameter	8¾ in. diameter
Wall Thickness	5½ to 9 in.—VT 28, VT28X 9 to 17½ in.—No. 28—1 Extension sleeve 17½ to 26 in. No. 28—2 Extension sleeve	5½ to 9½ in.—VS 30, VS 32 9½ to 13½ in.—VS 31, VS 33 13½ to 21½ in.—VS 31 and 31—1 Extension sleeve; VS 33 and 33—1 Extension sleeve 21½ to 29½ in.—VS 31 and 31—2 Extension sleeve; VS 33 and 33—2 Extension sleeve	
Louvres	Three Inter-Locking	One-Piece	Streamlined
Finish (grille)	VT 28—Brushed Aluminum VT 28X—Polished Aluminum	Silchrome	Silchrome
(wall sleeve)	Mat Silver—Plated	Silchrome	Silchrome
Wiring	BX or Conduit	BX or Conduit	BX or Conduit
Motor	Induction 110-120 volts 50-60 cycle a.c.	Induction 110-120 volts 50-60 cycle a.c.	Induction 110-120 volts 50-60 cycle a.c.
Watts	70	40	35

All Victor In-Bilts guaranteed one year against electrical and mechanical defects.

AMERICAN COOLAIR CORPORATION

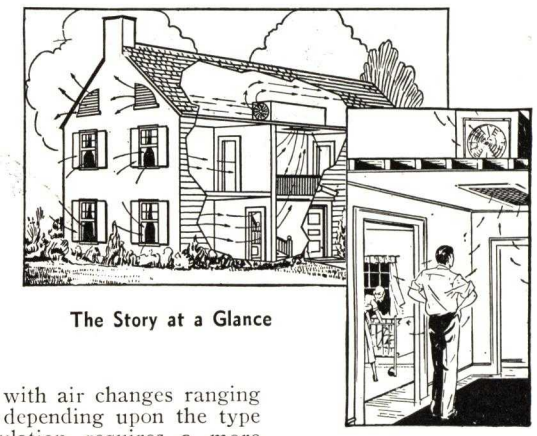
Manufacturers of Coolair Ventilating and Cooling Systems

JACKSONVILLE, FLA.

COOLAIR VENTILATING AND COOLING SYSTEMS

Cooling homes and commercial buildings through air circulation is a field pioneered by COOLAIR for more than ten years. Every one is familiar with the delightful cooling effect of a natural breeze or a refreshing automobile ride. The moving air evaporates moisture from the human body, creating a cooling sensation equivalent to a 5° or 6° drop in temperature.

In addition to creating a natural breeze, COOLAIR forces stagnant overheated air out of the building making the inside just as cool as the outside air. The removal of overheated air plus the cooling effect of the gentle breeeze provides summer comfort. The system is even more effective at night, when the outside air is 10° to 20° cooler than the air in the home.



The Story at a Glance

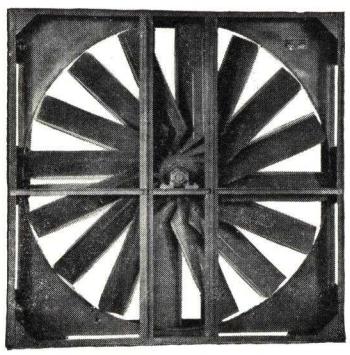
Do not confuse cooling with ventilation. Ventilation can be provided with air changes ranging from once each two to five minutes depending upon the type building. Cooling through air circulation requires a more rapid rate of air change ranging from once each one-half to once each one and one-half minutes.

One of the outstanding advantages of COOLAIR ventilating fans is that they will deliver more air under free delivery with less horsepower and, consequently, less operating cost than other types of air handling equipment. Frequently the elimination of costly and unnecessary duct systems will more than pay for the COOLAIR equipment. It is important to provide ample exhaust and intake openings to avoid restricting the air volume. In no case should the net free air passage area be less than the area of the fan, and for maximum quietness the free area should be enough larger than the fan to assure a grill velocity of not more than 750 ft. per minute.

There is a COOLAIR system for every requirement, and our Engineering Department will gladly assist in working out the application to your problem.

Description

COOLAIR Belt Drive Fans are designed to meet the ventilating and cooling requirements of any building, large or small. They deliver gently moving air in sufficient volume to cool as well as ventilate. They spread the air in all directions, sweeping the entire room, and are just as efficient when blowing in as when exhausting from a building. One or more units of proper size correctly placed will maintain a constant flow of fresh air, drawing it from the outside through windows and doors or other openings and forcing it out again through the exhaust openings. The V-belt drive feature permits using standard electric motors operating at the most efficient speed, and easily replaced in event of motor trouble. Slower speed motors are costly, difficult to replace and not as efficient. With the simple exchange of a motor the COOLAIR unit can be converted from a very quiet, slowly turning residence unit using a small motor, to a high speed industrial unit using a large motor.



Standard Type—Front View

The belt drive fans are designed to operate in either direction, so that by using a reversible motor air can be blown into or exhausted from the building at will. This is particularly advantageous when it is desired to pull air from the cool side of the building in the morning and then reverse the procedure when the sun moves to the opposite side in the afternoon. It also makes it possible to operate the fan with the prevailing breeze, reversing the fan to meet the changes in the direction of the breeze.

Advantages

(1) Low initial cost. Greater air delivery per dollar of power.

(2) Economical operation. The V-belt drive permits using a small motor at the most efficient speed, easily replaced in event of motor trouble. Slower speed motors are costly, difficult to replace and not as efficient.

(3) Quiet performance. The large slowly turning fan wheel delivers great volumes of gently moving air without objectionable noise or drafts.

(4) Reversible. Can be equipped with reversible motors to exhaust or blow in at will.

(5) Air volume controlled by means of two-speed pulley on smaller units.

(6) Rubber insulated motor support. Adjustable to maintain proper belt tension.

(7) Equipped with best ball bearings money can buy, assembled in dustproof, grease-packed housings.

(8) Easy to install. The steel blades and sturdy square steel frame make durable units, yet light in weight.

(9) The electric motors are standard types, made by one of the best known motor manufacturers. They can be enclosed when specified, and no vent holes are necessary to keep them cool. As a result, lint or dust cannot penetrate into the motor.

(10) Blades are individually mounted. Easy and inexpensive to replace in event of damage.

(11) The Type "B" units, when equipped with ball bearing motors, are suitable for operation in any position.

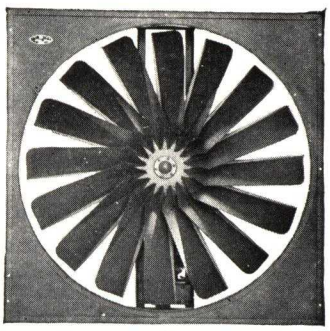
(12) Blades of Type "B" belt drive units are non-overloading, eliminating danger of motor failure through neglecting to open exhaust or intake louvers.

(13) All Coolair equipment is backed by a factory organization that lists satisfied customers first among its assets.

OVER-ALL DIMENSIONS

Size	Height and †width, in.	Approximate depth, in.
2B	30⅝	12
2½ B	36⅝	12
3B	42⅝	12
3½ B	49	16
4B	55⅛	17½
4½ B	61⅛	18½
5B	67⅝	16½
*6	75¼	28
*7	87½	34½
*8	99½	34
*9	112	34

*Standard type frames.
†Double width for Type "T" units.



Type "B"—Front View

PERFORMANCE DATA—COOLAIR BELT DRIVE FANS

Fan Size	Horsepower	Watts per hour	Fan, r.p.m.	Standard Code Test, c.f.m.
2B	° ¼	190	427	3250
	† ¼	280	582	4450
2½B	° ¼	300	413	5750
	† ⅓	420	460	6400
	†† ½	570	507	7000
	†† ¾	800	663	9200
3B	° ¼	300	305	7800
	† ⅓	420	340	8700
	† ½	570	385	9800
	†† ¾	800	448	11000
	†† 1	1035	529	13500
3½B	° ⅓	420	258	11200
	† ½	570	290	12100
	† ¾	800	350	14600
	†† 1	1050	392	16300
	†† 1½	1450	489	20400
4B	° ½	570	259	15800
	† ¾	800	277	17000
	† 1	1085	306	18800
	†† 1½	1450	369	22500
4½B	° ½	570	194	17000
	† ¾	800	225	19700
	† 1	1085	260	22700
	†† 1½	1450	286	25000
	†† 2	1900	329	28000
5B	° ¾	800	195	23000
	† 1	1085	211	25000
	† 1½	1450	251	29600
	†† 2	1900	277	32800
	†† 3	2850	324	38000

Fan Size	Horsepower	*Watts per hour	Fan, r.p.m.	Standard Code Test, c.f.m.
6	° 1	1085	171	32000
	† 1½	1500	190	35500
	† 2	1900	206	38500
	†† 3	2850	263	49000
	†† 5	4500	306	57500
7	° 2	1900	163	49500
	† 3	2850	176	53500
	†† 5	4500	227	72000
	†† 7½	6500	262	80000
8	° 3	2850	147	66500
	† 5	4500	176	80000
	†† 7½	6500	204	93000
	†† 10	8700	277	104000
9	° 5	4500	150	98000
	† 7½	6500	165	108000
	†† 10	8700	193	128000
	†† 15	13000	237	155000
2½T	° ⅓	420	387	10760
	† ½	570	442	12200
3T	° ⅓	420	277	14170
	† ½	570	334	17000
	† ¾	800	380	18600
3½T	° ½	570	245	20440
	† ¾	800	305	25440
	† 1	1085	357	26590

*Average wattage on size 6 and larger.
°Very quiet (homes, theaters, hospitals, churches, offices, banks, etc.)
†Quiet (stores, restaurants, barber shops, etc.)
††Industrial (laundries, bakeries, factories, canneries, pressing clubs, garages, etc.)

COOLAIR DIRECT DRIVE FANS

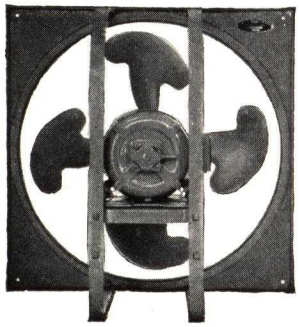
COOLAIR Direct Drive Fans were developed to meet demand for a small, relatively inexpensive, high speed fan without the characteristic aeroplane noise. They are positively quiet when operating at 1200 r.p.m. and are not excessively noisy at 1800 r.p.m.

The unique blade, covered by U. S. Patent No. 1,855,660, is designed to give maximum air per horsepower with minimum noise. Large surfaces at blade tips create a surprising velocity, while noise is reduced by cutting out and shaping at the center.

Type "B" Direct Drive COOLAIR Fans are now manufactured in four sizes with capacities to meet the most exacting requirements. They are truly flexible units. At 1200 r.p.m. they are excellent for installations requiring quiet operation, such as residence kitchens, small stores, etc. At 1800 r.p.m. they are efficient for cooling, drying; for removing dust and fumes.

Motors are totally enclosed long hour service types and the ⅙ hp. and larger are ball bearing, permitting operation in any position and under extreme temperature or humidity conditions. The motors are also cushion mounted to reduce vibration and to insure quiet operation.

COOLAIR has tried to make the Type "B" Direct Drive fans the highest quality direct drive fans money can buy.



DIMENSIONS

Size	Height and width, in.	*Depth, in.
16B	21	8½
18B	22¾	11
20B	24¾	11
24B	29 1/16	13

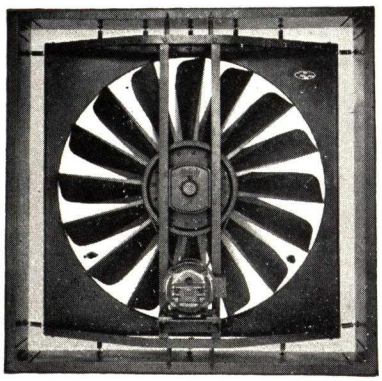
*"Depth" dimensions approximate, depending on type motor.

PERFORMANCE DATA—COOLAIR DIRECT DRIVE FANS

Fan Size	Horsepower	Average watts, per hour	Fan, r.p.m.	Cu. ft. air per minute
16B	*1/30	50	1165	1360
	*1/15	100	1750	2050
18B	⅙	200	1165	2250
	¼	300	1750	2900
20B	⅙	200	1165	2640
	¼	300	1750	4000
24B	¼	300	1165	4450
	¾	800	1750	6900

*Sleeve bearing motor. All others ball bearing.

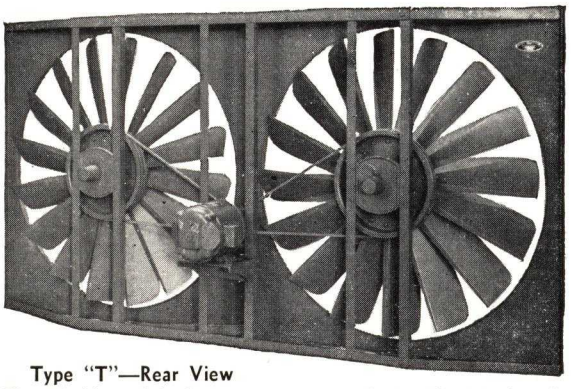
COOLAIR RESIDENCE UNITS—PRACTICAL AND ECONOMICAL



Type "B"—Mounted on Springs Rear View

Type "B" Unit—Unique spring suspension eliminates all vibration noise. Comes complete with mounting springs; wood frame to be supplied by installation contractor. Quiet, trouble-free, a size for every home or apartment. Unit and spring mounting method covered by U. S. Patent No. 1,992,112.

Twin Unit—Type "T"—For homes where attic headroom or clearance will not permit use of single fan of proper size. Two smaller fans mounted side by side in one frame operate efficiently and economically. Patent applied for.



Type "T"—Rear View
Use of this model often saves expense of alterations to install a large fan

Send for new, illustrated Instruction and Installation Manual on COOLAIR home cooling systems

MEMORANDA

TELEPHONE
MUrray Hill 3 9744

DAVIES AIR FILTER CORPORATION

396 Fourth Avenue, NEW YORK, N. Y.

THE AIR FILTERING AND SILENCING VENTILATOR

Perfect Ventilation in Any Weather

The Filteraire is designed to give pleasant ventilation the year round.

Here is what it does:

(1) It ventilates without drafts, giving all the air you need.

(2) It shuts out all street noises.

(3) It cleans the air of all dust, soot, pollen and bacteria.

(4) It provides positive circulation of air in the room. With its double set of louvers you can direct the air to any corner of the room.

Filteraire is portable and can be installed in any window and moved to a new address.

FILTERAIRE
BRINGS IN CLEAN AIR-KEEPS OUT NOISE

A Typical Filteraire Installation
Note how Filteraire harmonizes with the surroundings in this modern living room

Important Features of Filteraire

Within this sturdily built compact unit is a large centrifugal blower, an air filter and the patented Davies Silencer which muffles and absorbs all outside street, motor and air noises.

A double set of adjustable shutters, which is an exclusive feature on Filteraire, allows the air to be directed to any part of the room.

A pilot light in front shows when the machine is operating; its function is to save electricity.

Installation in sash type windows is a matter of fifteen minutes. Can also be installed in casement or factory type windows.

Specifications

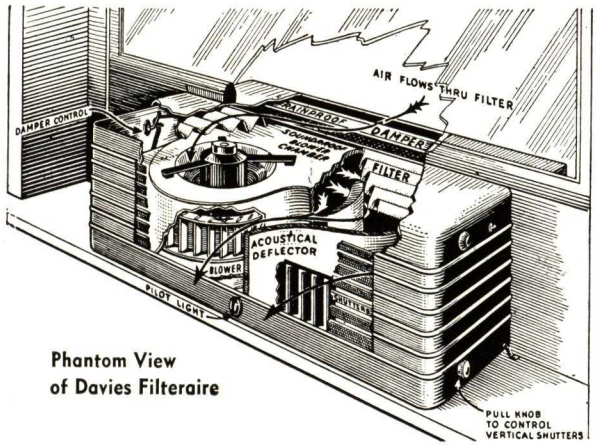
Dimensions:
Length—27 ins.
Width—15 ins.
Height—10 ins.
Projects only 6½ ins. into the room.
Capacity—500 cu. ft. of filtered air per minute.

CONSTRUCTION FEATURES

(1) Motor—Specially designed with wool packed bearings, variable speed control.
A.C.—Condensor type.
D.C.—Shunt wound.

(2) Blower—Eight inch centrifugal aluminum balanced wheel. Capacity—500 c.f.m.

(3) Cabinet—Constructed entirely of high grade furniture steel. Finish consists of one baked priming coat and one coat of baked synthetic enamel. Standard colors — ivory and brown. Special colors or wood grain finish supplied on request.



Phantom View of Davies Filteraire

(4) Filter—Of our own manufacture especially designed for this unit, full size industrial type known as A200. It consists of 8 sq. ft. of especially processed cotton assuring complete filtration of dust, pollen, etc. The large filtering surface assures long life and high efficiency. Replacement filters are very inexpensive.

(5) Silencer—Consists of acoustically treated blower chamber and labyrinthic ducts. All walls are lined with patented Davies Sound Deadening material.

(6) Damper Control—A steel plate damper operated by a control knob at the left of the machine will shut out all air when closed. This damper will keep out rain whether open or closed.

PROMINENT USERS OF FILTERAIRE

Hospitals and Laboratories

Department of Health Research Laboratories, New York, N. Y.
French Hospital, New York, N. Y.
Jewish Hospital of Brooklyn, Brooklyn, N. Y.
New York Hospital, New York, N. Y.
Hall Institute, Melbourne Hospital, Melbourne, Australia
United States Department of Agriculture Laboratories, Washington, D. C.
Asthma and Hay Fever Sanitorium, Iowa City, Iowa
University of California, San Francisco, Cal.
Gelzer Laboratories, Buenos Aires, Argentina
Louisiana State University, Baton Rouge, La.

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Sperry Gyroscope Co., Inc., Brooklyn, N. Y.
Burnett-Timken Research Laboratory, Alpine, N. J.
Arlington Chemical Co., Yonkers, N. Y.
The Bayer Company, Inc., Rensselear, N. Y.
H. J. Heinz, Co., Pittsburgh, Pa.
Crucible Steel Co. of America, Harrison, N. J.
Nitragen Co., Milwaukee, Wis.
McQueen Bacteria Co., Baltic, Ohio
State Department of Health, Austin, Tex.
International Vitamin Co., New York, N. Y.

THE EMERSON ELECTRIC MFG. CO.

ST. LOUIS, MO.

BRANCH OFFICES

CHICAGO, ILL., 564 W. Randolph Street
CINCINNATI, OHIO, 457 East Sixth Street
DETROIT, MICH., Woodward at Grand Avenue
NEW YORK, N. Y., 17 East 42nd Street

Authorized Wholesalers and Retailers in all Principal Cities

EMERSON ELECTRIC

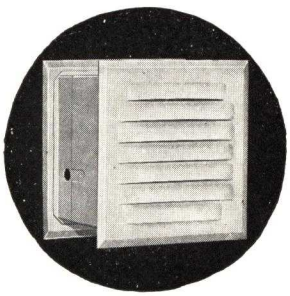
MOTORS – FANS – APPLIANCES

Leaders in the Fan and Motor Industry Since 1890

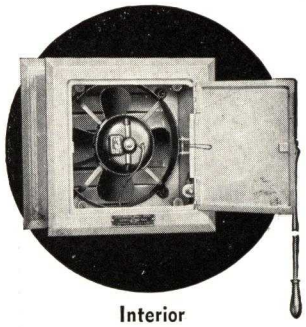
Kitchen Ventilating Fans

In the modern kitchen a ventilating fan is a necessity to exhaust cooking odors, steam and excessive heat, and to prevent spreading them to other rooms in the home.

Emerson-Electric wall boxes are for permanent built-in installations. In new homes they are installed when the walls are erected. They can be installed at very little extra expense when modernizing kitchens.



Exterior



Interior

Features—The welded-steel wall box is made in two telescoping sections, adjustable to wall thickness. Fan and inner door panel are installed after the plastering is completed. No special wood frame or lintel is necessary. Line leads may be brought out through special openings at either side of box or through insulating bushing in door frame, for connection to convenience outlet. Door may be hinged from either side by merely inverting door frame. Automatic switch starts and stops fan with opening and closing of door. Furnished with handle for operating door. Exterior section has permanent louvre which protects the fan from the elements. Exposed parts made of rust-resisting steel. All parts finished in washable, durable, gray enamel. These wall boxes are available in two sizes, each with two types of fans, described below.

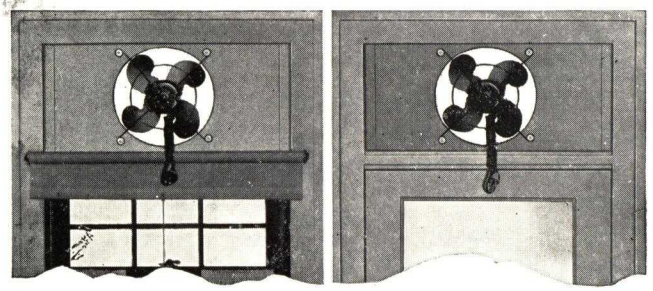
Standard Emerson-Electric Ventilators

Type 2345, 9-in. fan, 600 c.f.m. free air delivery.
Type 59666, 12-in. fan, 1050 c.f.m. free air delivery.
Fully-enclosed, dustproof, induction-type, *electrically reversible motors.* Exhausts kitchen air or brings in fresh air. Toggle reversing switch on motor cover, is operated with same handle furnished for opening door of wall box. Motor mounting supports have sponge-rubber bushings which insulate the fan for quiet operation. Wool-packed bronze bearings. Cotton wicking leads oil to the shaft. Requires lubrication only a few times a year. One-year guarantee. (Does not interfere with radio reception.)

Emerson—Seabreeze Popular-Priced Ventilators

Type 3350-AA, 10-in. fan, 570 c.f.m. free air delivery.
Type 3360-AA, 12-in. fan, 875 c.f.m. free air delivery.
Non-reversible, induction-type motor for exhaust duty only. Parker blades. Self-aligning, wool-packed, bronze bearings with felt-packed oil reservoirs. Sponge-rubber bushings on the motor supports insulate the fan for quiet operation. One-year guarantee. (Does not interfere with radio reception.)

Ventilators with Metal Mounting Panels for Window or Transom

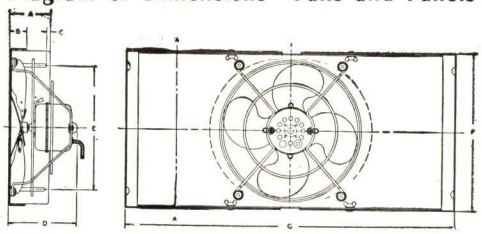


Panel ventilators provide an inexpensive yet effective method of securing proper ventilation in kitchens, bedrooms, lavatories and other rooms of similar size. They do not interfere with the operation of the window, being designed to install flush with stops on the inside. When fan is operated the upper sash is lowered to the bottom of panel.

Features—Adjustable in width. Attached with 4 wood screws. Finished in washable, durable, gray enamel. Panels are made in three sizes for Emerson-Electric Ventilators and in two sizes for Seabreeze Ventilators.

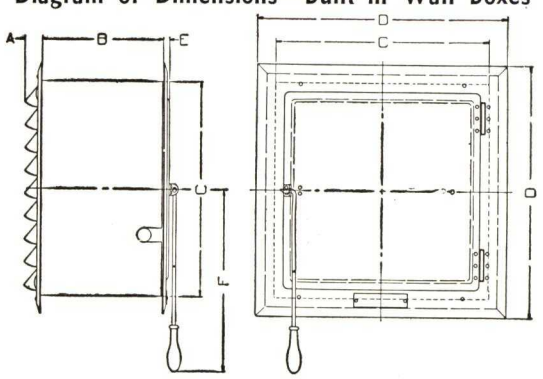
Type 2345, 9-in., reversible fan, panel adjustable 26 to 38 in.
Type 59666, 12-in., reversible fan, panel adjustable 27 to 37 in.
Type 59666, 12-in., reversible fan, panel adjustable 36 to 46 in.
Type 3350, 10-in., Seabreeze fan, panel adjustable 23 to 36 in.
Type 3360, 12-in., Seabreeze fan, panel adjustable 27 to 37 in.

Diagram of Dimensions—Fans and Panels



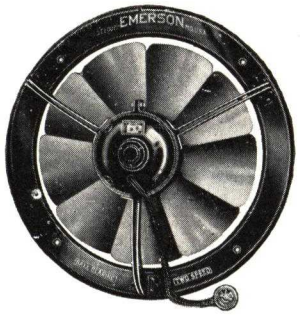
Fan type	A	B	C	D	E	F	G
2345	4″	1 9/16″	3/8″	5 21/32″	9″	11 1/2″	26″ to 38″
59666	4″	1 5/8″	3/8″	7 19/32″	11 3/4″	14 1/4″	27″ to 37″
59666	4″	1 5/8″	3/8″	7 19/32″	11 3/4″	14 1/4″	36″ to 46″
3350	3″	1 1/4″	1/4″	4 31/32″	9″	11 1/2″	23″ to 36″
3360	4″	1 5/8″	3/8″	6 1/4″	11 3/4″	14 1/4″	27″ to 37″

Diagram of Dimensions—Built-in Wall Boxes

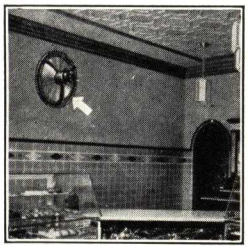


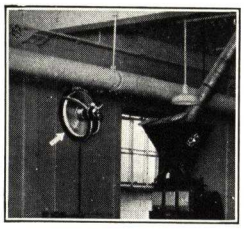
Fan Type	A	B	C	D	E	F
2345 } 3350-AA	1 1/8″	8″ to 14″	11 1/16″	13 1/2″	3/8″	28 1/16″
59666 } 3360-AA	1 1/8″	8″ to 15″	14 1/16″	16 1/2″	3/8″	28 1/16″

Emerson-Electric 2-speed Exhaust Fans



Emerson - Electric Exhaust Fans are used in all types of commercial and industrial buildings to exhaust heat, steam, odors, fumes, dust and excess humidity. In stores, shops and offices they are used to provide proper air circulation and ventilation.





Features — *Two-speed, fully-enclosed, ball-bearing motors;* self-cooled—the air stream passing over the exterior surfaces prevents overheating.

Can be installed horizontally, vertically or at any angle without injury to the motor. Slow speed, quiet operation. Steel supporting arms, outside mounting ring and motor clamping ring. Specially designed overlapping blades made of rust-resisting steel and finished in durable enamel. Available in five sizes: 12, 16, 18, 24 and 30-in. diameters with capacities ranging from 725 to 6700 c.f.m.

Automatic Shutters

Automatic shutters that effectively close the opening and protect the fan when not in operation are supplied in all sizes.

The louvers are made of aluminum, and each shutter is individually hung on corrosion-proof brass pins, to assure continuous service, without attention.

When the fan is started, the louvers, being light in weight, open and give practically no resistance to the flow of air. When the fan is stopped they close of their own weight. The tie-rod connecting the individual louvers holds them rigid and prevents rattling.

Made in five sizes for 12, 16, 18, 24 and 30-in. exhaust fan openings.

Types of rooms and buildings	Required changes per hour
Club rooms, billiard and card rooms	6– 8
Dining rooms	2– 3
Sleeping Quarters	1– 2
Offices, banks, drug, grocery and barber shops	4– 6
Smoking rooms and bowling alleys	8–10
Public lavatories	18–25
Garages and laundries	10–15
Restaurants	10–14
Kitchens	12–15
Markets	8–12

The proper size exhaust equipment required is determined by two factors—(a) Size of room or other space to be ventilated. (b) Number of times per hour the air is to be changed.

After determining the number of cubic feet of air in the space to be ventilated multiply that figure by the number of times per hour the air is to be changed. That gives the volume of air to be removed per hour and determines the size of exhaust fan or number of exhaust fans needed.

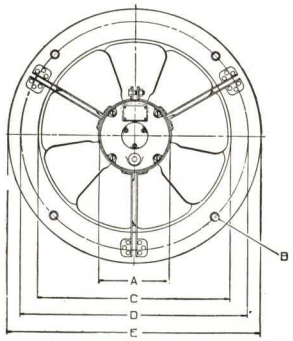
If ducts are used they should be as short and direct as possible. Round ducts should be from 2 to 6 in. larger in diameter than the fan. Rectangular ducts should be as nearly square as possible with 50 per cent greater area than diameter of fan used.

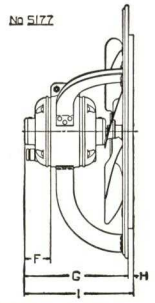
Fans should be installed to exhaust directly into the open air with prevailing winds and not against them.

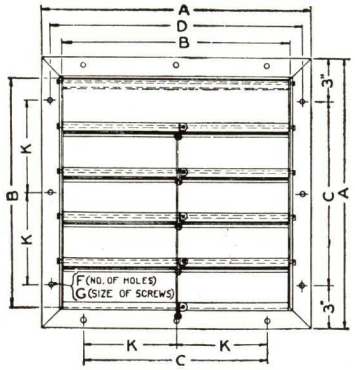
PERFORMANCE OF 60-CYCLE AND DIRECT-CURRENT EXHAUST FANS IN FREE AIR AND AGAINST STATIC PRESSURE

Size fan	R.p.m.	C.f.m. free air	C.f.m. under static pressure (inches of water)									
			.05	.1	.15	.2	.25	.3	.35	.40	.45	.50
12″	1140	850	700	500	300	*C.f.m.—Cubic feet of air per minute.*						
	860	725	525	375	230	*R.p.m.—Speed of fan in revolutions per minute.*						
16″	1140	1500	1350	1150	925	670	400					
	860	1125	1050	875	700	500	300					
18″	1140	2350	2150	2000	1750	1550	1200	700	400			
	860	1750	1650	1500	1300	1150	900	570	300			
24″	860	4000	3800	3600	3300	3000	2700	2300	2000	1500	900	400
	570	2700	2550	2500	2200	2000	1800	1500	1300	1000	650	250
30″	685	6700	6200	5740	5240	4800	4350	3860	3360	2700	2200	1500
	570	5600	5180	4750	4350	4000	3620	3200	2780	2300	1820	1240

Diagrams of Dimensions Emerson-Electric Exhaust Fans and Automatic Shutters







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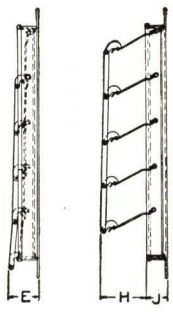


DIMENSIONS EMERSON-ELECTRIC EXHAUST FANS

Size of fan	A	B		C	D	E	F	G	H	I
		No.	Size							
12″ A.C.	4 7/8″	3	5/16″	12 3/8″	14 1/8″	15 9/16″	2 5/16″	7 3/4″	3/8″	8 1/8″
12″ D.C.	4 7/8″	3	5/16″	12 3/8″	14 1/8″	15 9/16″	2 5/16″	7 3/4″	3/8″	8 1/8″
16″ A.C.	6 1/16″	4	9/16″	16 1/2″	19 1/2″	21 3/4″	2 1/4″	9″	7/16″	9 7/16″
16″ D.C.	6 1/16″	4	9/16″	16 1/2″	19 1/2″	21 3/4″	3 1/16″	9 13/16″	7/16″	10 1/4″
18″ A.C.	7 1/16″	4	9/16″	18 1/2″	21 3/8″	23 3/4″	2 5/8″	9 3/8″	7/16″	9 13/16″
18″ D.C.	7 1/16″	4	9/16″	18 1/2″	21 3/8″	23 3/4″	3 29/32″	10 29/32″	7/16″	11 11/32″
24″ A.C.	8 1/2″	4	9/16″	24 3/4″	28 1/2″	31 1/2″	3 5/8″	13 3/8″	11/16″	14 1/16″
24″ D.C.	8 1/2″	4	9/16″	24 3/4″	28 1/2″	31 1/2″	4 17/32″	14 9/32″	11/16″	14 31/32″
30″ A.C.	11 1/4″	4	9/16″	30 3/4″	35 1/2″	39 1/4″	4 1/4″	16 3/8″	7/8″	17 1/4″
30″ D.C.	11 1/4″	4	9/16″	30 3/4″	35 1/2″	39 1/4″	6″	18 1/8″	7/8″	19″

DIMENSIONS AUTOMATIC SHUTTERS FOR USE WITH EXHAUST FANS

Size fan	Dimensions									
	A	B	C	D	E	F	G	H	J	K
12″	14 3/4″	12″	8 3/4″	13 5/8″	1 3/4″	8	1/4″	3″	1 9/16″	.....
16″	19″	16″	13″	17 1/2″	2 1/4″	8	1/4″	3″	1 9/16″	.....
18″	21″	18″	15″	19 1/2″	2 1/4″	8	1/4″	3″	1 9/16″	.....
24″	27″	24″	21″	25 1/2″	2 1/4″	12	1/4″	3″	1 9/16″	10 1/2″
30″	33″	30″	27″	31 1/2″	2 1/4″	12	1/4″	3″	1 9/16″	13 1/2″

See next page for listing of Emerson-Electric Air Circulators, Ceiling and Portable Fans.

Emerson-Electric Air Circulators

Emerson-Electric Air Circulators are recommended for installation in all public places, and wherever there is a problem of providing rapid ventilation over large areas, such as in retail stores and shops, taverns, restaurants, churches, recreation buildings and industrial plants of all kinds.

Three types of fans—four styles of mountings.

Type S60WC, 24 in., 1-speed, 3600 c.f.m.

Type S60WA, 24 in., 2-speed, 4800 c.f.m. (high speed)

Type S60WB, 30 in., 2-speed, 6000 c.f.m. (high speed)

Type S60WC is a four-blade fan, others have three blades. Above types are for 110 volts, 60 cycles, alternating current. Can also be furnished for direct current.

All three types can be used with any of four styles of mounting accessories; ceiling, wall-bracket, counter or adjustable floor-column.

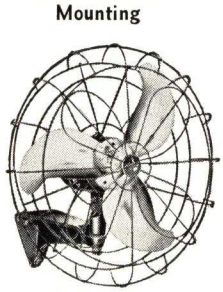
When used in industrial plants as man-coolers or other places where safety conditions require, fine mesh guards are available.

Adjustable Floor Column Mounting

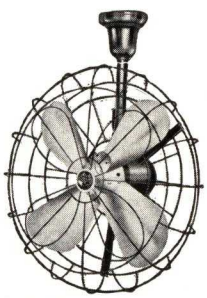
Features—Induction-type, streamlined, *fully-enclosed motor with grease-packed ball bearings.* Will normally give 6000 hours of service before relubrication is necessary. Spot-welded, 2-piece, ornamental guard. Can be tilted to any position from 8° above horizontal to 25° below horizontal in ceiling mounting, or vice versa in column or bracket mounting. Pull switch in back motor cover. Rubber-insulated mounting yoke. Standard fans are finished in black with polished blades. Also available in chromium plated finish.

Installation Suggestions—Circulators are usually placed to blow from front to rear with the entry of outside air from the front doors and exhausting through windows in the rear. The location of columns, ceiling beams, and other obstructions that may reduce the free flow of air through the building, must be taken into consideration in placing the fans.

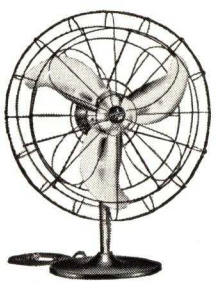
Ceiling height varies with each building; however, where possible, best results will be obtained when the fans are installed so the center of the fan is located approximately 9 ft. from the floor. By tilting the fan at an angle of approximately 7 degrees, the fan will produce a satisfactory circulation of air at the breathing line, without causing a disturbing draft or interfering with the display of merchandise. In buildings with low ceilings, it may be desirable to mount the fans exactly horizontal or to tilt them slightly upward, instead of downward, to create a general air turbulence. In buildings with exceptionally high ceilings, or places where ceiling installation is not practical, either of the other three types of mountings—wall-bracket, floor-column, or counter-column may be used to advantage.



Wall Mounting

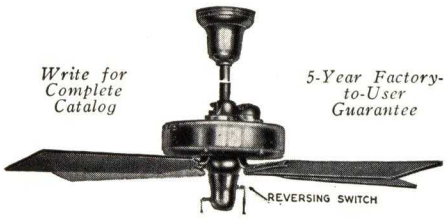


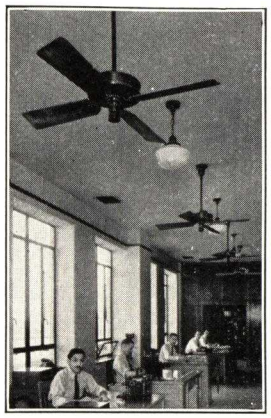
Ceiling Mounting



Counter Mounting

Emerson-Electric Ceiling Fans





Ceiling fans are becoming increasingly important as the need for adequate air circulation becomes more apparent. Hotels, offices, restaurants, stores and homes have requirements that are best solved by the use of ceiling fans.

Emerson-Electric has been a leader in value since ceiling fans were first introduced, with more long-life construction features, more dependable and economical operation, and a service record that grows more impressive with each passing year.

Features—Two sizes, 36 and 52-in. Sweep Fans; 2 and 3-speeds, respectively. Electrically reversible (blow air up or down) and non-reversible types. Available with or without fitter for use with light and unit glassware. All switches can be on the fan or wall switches for remote control can be used. Ball bearings are submerged and rotate in oil. Special lubrication system gives continuous oil circulation. Cannot leak oil. Oil cup may be drained and refilled without removing fan from ceiling. All types wired for lights.

Emerson-Electric Portable Fans

Stand fans—the newest innovation in fan design—are now available in several models. They are recommended because of their portability and ease of adjustment to meet practically any usage in hotel rooms, offices, shops and homes.

Shown at left is overlapping-blade oscillator, available in 10 and 12-in. sizes. The ornamental Silver Swan (right) is made in the 12-in. size only. Stands are adjustable from 3 ft. 3 in. minimum to 4 ft. 9 in. maximum, floor to center of fan.

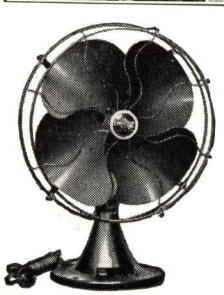
Emerson-Electric Wall-Type Fans

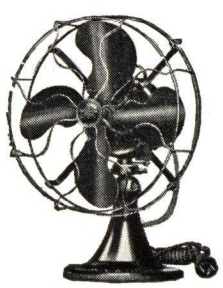
Emerson-Electric Parker and Overlapping-Blade Oscillators are standard equipment in many of the nation's largest institutions.

Available in 10, 12, and 16-in. sizes.

Features—Stationary, hollow-steel shaft. Force-feed lubrication system. Oiltight, dust-proof bearing, can not throw oil from the blades. Finger-tip oscillation control. Patented adjusting collar permits pointing fan in a wide arc without moving base.

Write for complete catalog.





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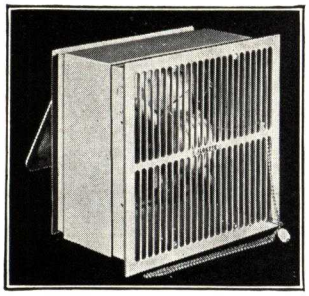
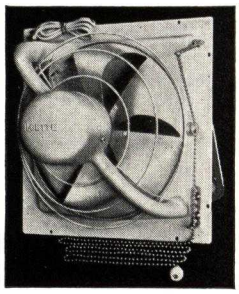
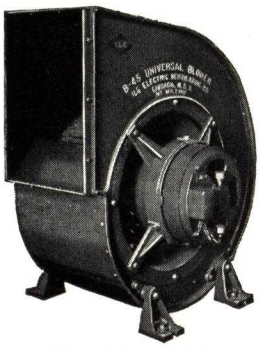
VENTILATION
and Air Conditioning



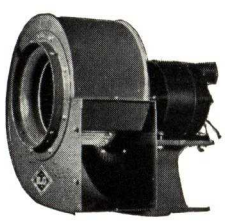
Built-in Ilg Kitchen Ventilator



Package Ilgette Kitchen Ventilator



Direct-Connected Type B Blower



Type B Volume Blower

Products

FANS, BLOWERS, UNIT HEATERS, and COOLERS, AIR CONDITIONERS.

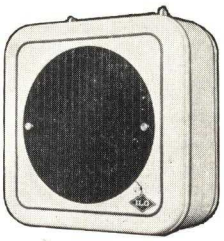
Ilg Kitchen Ventilators

An Ilg kitchen ventilator is one of the housewife's most useful servants. It quickly, quietly, thoroughly, exhausts the cooking odors and the excessive heat of cooking and provides ventilation for the whole house without the draft of open windows. Available in two sizes—the Ilgette for small kitchens; the Ilgair for the larger kitchens, and each is available in models for the wall, window or transom. Both the Ilgette and Ilgair have the fully enclosed Ilg self-cooled motor, noted for its quietness, power, economy and long-life. There is no radio interference. See Ilg Catalog FB-46.

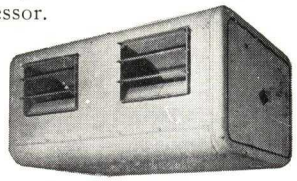
Blowers

Ilg blowers are available in a number of types and a wide range of sizes with both direct-connected and belted drives. Ilg Type B and Type P volume blowers are suitable for small volume low-pressure work in direct-connected type only. Ilg Type B direct-connected Universal blowers and the Type BW belted Universal blowers cover a complete range of capacities in the higher brackets. Ilg Type BC direct-connected and belted Universal blowers with backward curved blade wheels have non-overloading motor characteristics. All capacities are rated in accordance with the Test Code of American Society of Heating and Ventilating Engineers. See Ilg Catalog FB-46.

Air Conditioning and Cooling Units



Ilg Ceiling Type Cooling Unit



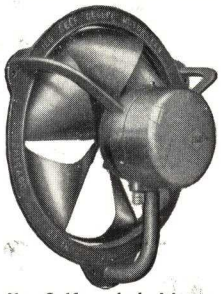
Ilg Central System Air Conditioner

Ilg offers a complete series of models for partial and year-round air conditioning. Ilg central system air conditioners are suitable for residential or commercial air conditioning, including winter or summer air conditioning or both. Unit systems are also available, consisting of one or more ceiling or floor type cooling units connected singly or in multiple to a remotely located compressor. These units can also be used for heating. They are suitable for stores, offices, restaurants, etc.

Two self-contained room cooling units are available:—Model 11 Ilg Spot Kooler, a ½-ton model with water-cooled condenser; Model 31 Ilg Spot Kooler, a ½-ton model with air-cooled condenser. Both closely resemble a console model radio cabinet in size and appearance. Each is a complete summer air conditioner for cooling, dehumidifying and circulating the air.

Ilg air conditioning systems are designed for simple, quick installation and servicing, dependable operation and long life.

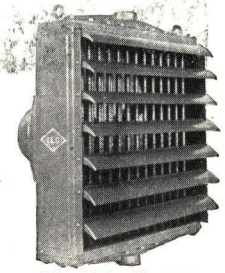
Electric Ventilating Fans



Ilg Self-cooled Motor Propeller Fan

Made in sizes from 9½ to 72 in. with capacities 450 to 40500 c.f.m. Each fan has the famous Ilg self-cooled motor which is exclusive in Ilg fans and is responsible for the economy, durability and efficiency characteristic of Ilg fans. Models are available for wall mounting and for use as power-roof ventilators. Other models include floor fans, attic cooling fans, etc. Ilg Catalog FB-46.

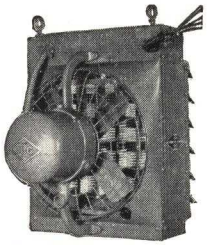
Ilg Unit Heaters



Ilg Unit Heater For Steam or Hot Water

The new Ilg unit heater for steam or hot water has won its way into the factories, stores, garages, etc., by its sheer ability to heat faster and better at lower cost. Its smooth, powerful Ilg self-cooled motor propeller fan enables it to concentrate its stream of warm air on the floor level and minimize heat losses above the working zone. It is available in standard finish, and also in deluxe finish in a number of attractive colors.

The Ilg all-electric unit heater is suitable for installation where ordinary heating methods are not practical. It heats instantly and uniformly and is intended for heavy duty use. An Ilg fully enclosed, self-cooled motor propeller fan insures quiet, steady distribution of heat to the working zone. Available in sizes from 1½ to 60 kw. capacity. See Ilg Catalog No. 126.



Ilg All-Electric Type Unit Heater

PRYNE & CO., INC.

Pioneer Manufacturers of Electric Ventilators for Homes

1245 East 33rd Street, LOS ANGELES, CAL.

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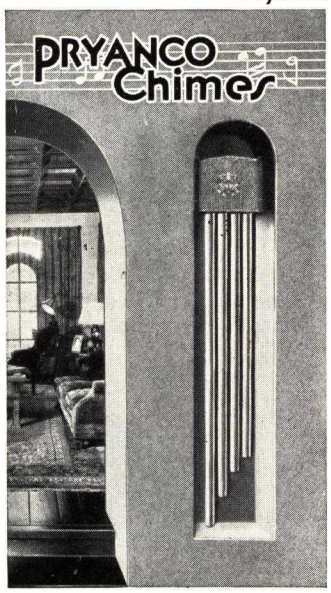
"Pryanco" Products

"Pacific Breeze" SIDEWALL Ventilators
"Blo-Fan" CEILING Ventilators
"Pry-lite" Concealed Lighting
"Pryanco" Door Chimes, Mail Boxes, Dorgrils and Building Specialties

"Pryanco" Chimes



2-tube Magnetic—*No. 299*—2 notes from front door only; over all 7½x42 in.

No. 301—Same as No. 299 with 2 notes front, 1 note rear door.

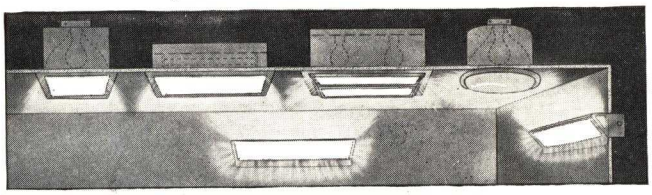
No. 302—Same as No. 301 with longer, heavier tubes; over all 7½x53½ in.

3 and 4 - Tube Motor Driven—*No. 303*—3 tubes, 4 or 6 notes front, high note side, low note rear door; over all 9x52 in.

No. 305—4 tubes, 8-note half-hour Westminster tune front, high note side, low note rear door; over all 9x60 in.

Motor driven sets may be installed with remote control for playing dinner chimes, servant calls and telephone calls. Chimes are built on same principle as distributor on an automobile and are reliable. Write for detailed specifications and catalog.

"Pry-lite" Concealed Illumination



"Pry-lite", the modern recessed illumination, is rapidly making surface fixtures out-of-date. A type for every room. Write for special catalog.

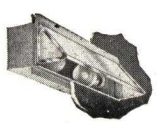
Cat. No.	Lamps			Rough opening		Notes
	Number	Type	Watts	Size, in.	Depth, in.	
100*	1	Mazda	100	9 x 9	8¼	*Flush frames with ground coat for painting on job. If desired in chrome add "—C" to stock number. All drop and wall frames are chrome plated.
102*	2	Lumiline	60	7⅛x20¾	4¼	
103*	2	Mazda	75	7⅛x20¾	7½	
153-C	2	Mazda	75	7⅛x20¾	5¾	
154-C	1	Mazda	100	10½" dia.	7½	
155-C	1	Mazda	100	10⅛x 4½	3¾	
156-C	2	Mazda	100	21½x 4½	3¾	

Scientifically designed to eliminate fire hazards. Line production items. Approved by Underwriters' Laboratories.

No. 153-C
With "Drop" chrome frame

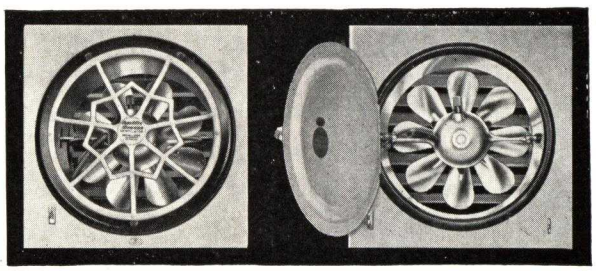
Nos. 100, 102, 103, 153-C and 154-C and for ceiling installation.
Nos. 155-C and 156-C and for sidewall installation only.

No. 156-C
For sidewall (chrome frame)



"Pacific Breeze" Sidewall Ventilators—Reversible

Made only in 10 and 12-in. sizes. The 10-in. size is either reversible or non-reversible; 12-in. size is non-reversible type only. Reversing mechanism somersaults the entire motor, thus preserving the efficiency of the cup on the fan blades for both directions.



Grille Type **Door Type**

Switch is built into the unit and is operated in conjunction with the exterior louvers by a slight pull or push on the left-hand lever. In reversible types a similar movement of the right-hand lever somersaults the motor (while running). Metal operating rod is furnished, making operation a very simple matter. Exterior louvers are opened and closed *mechanically* by switch lever—positive, non-fluttering, foolproof, weatherproof. Solid inside door (furnished in all climates, except extreme South) gives *double insulation against cold.* It is easily opened and closed by using the operating rod.

Tested and Approved 3068 by Good Housekeeping Institute GOOD HOUSEKEEPING MAGAZINE

INSTALLATION DATA

Cat. No.	Speeds	Blade size, in.	Reversible	Housing, in.	Wall depth, in.
106	1	10	No	12x12	6
109	1	10	Yes	12x12	9½
119	1	10	No	12x12	9½
113	1	10	Yes	12x12	13
124		10	Extension parts *only* for additional 15 in.		
140	2	12	No	14x14	6
143	2	12	No	14x14	9½
144	2	12	No	14x14	13
125		12	Extension parts *only* for additional 15 in.		

Door type furnished everywhere, except in California and extreme south, unless otherwise specified.

For Extra-thick Walls—Stock extension parts provide easy means of extending regular housings through cabinets or extra thick walls. Consist of auxiliary supporting housing, extension for air chamber and extension for switch-louver rod.

Motor and Guarantee—Motor manufactured and guaranteed jointly by Westinghouse and Pryne & Co. Streamlined, cast aluminum, polished, with special long-life oiling system; 1500 r.p.m.; 10-in. sizes 40 watts and 500 c.f.m.; 12-in. size 100 watts and 900 c.f.m. Fan blade one-piece aluminum. Conduit enters upper left hand corner.

Disassembled
Parts telescope

"BLO-FAN"

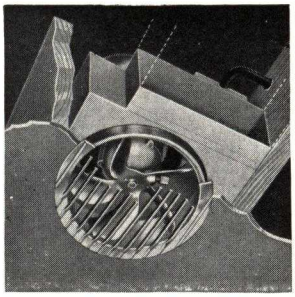
Advanced Blower-Type Ceiling Ventilator

Introduced for the first time in 1938, this new Pry-anco "Blo-Fan" Blower Unit is not comparable to anything else on the market.

"Blo-Fan" is neither a breeze fan nor a blower, but something of a combination—preserving the advantages but eliminating the weak points of each type.

Breeze Fan vs. Blower

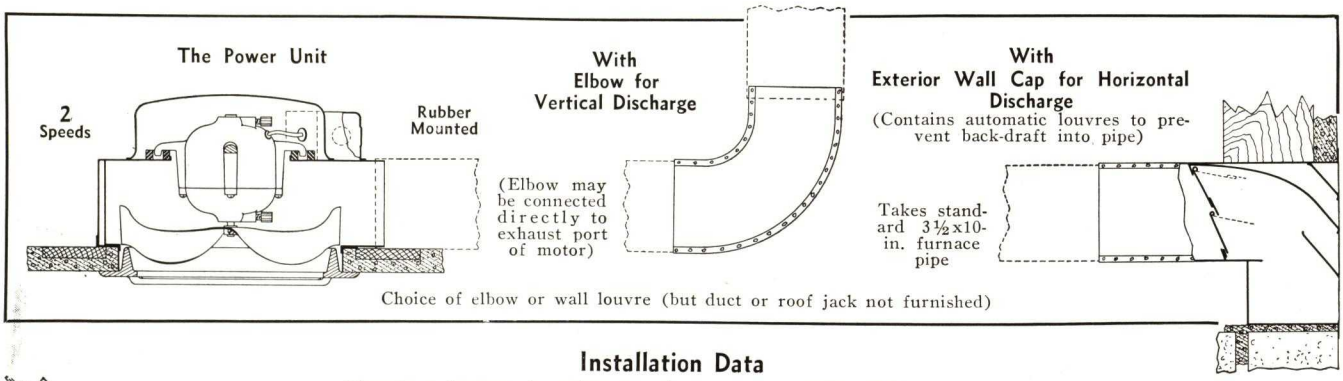
While breeze fans agitate a larger volume of *free* air, they are notorious for the way they lie down on the job when they meet a little resistance. Conventional cubic feet per minute figures are very misleading because they refer to "free air" and mean little when the air is being forced through a duct or against a head wind. Under such circumstances a breeze fan merely "churns" the air. On the other hand, blowers suffer from "shock loss" of sucking the air into the vacuum created by the blower blades. Consequently, they move less "free air" but are much more efficient against resistance.



Cut-away View of "Blo-Fan" as Seen from Room Below

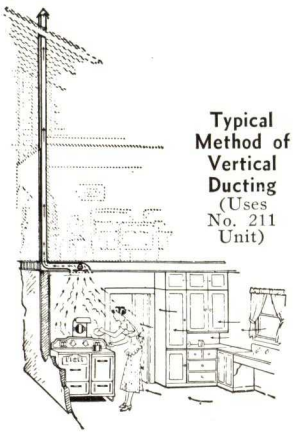
Where "Blo-Fan" Excels

"Blo-Fan" is a new, patented combination of breeze fan and blower principles. The *volume* of the breeze fan is combined with the *efficiency* of the blower. Air is fed into the vortex of the blower under pressure by the breeze-fan blades and is then *packed,* centrifugally, into the exhaust duct—*by blower pressure.* "Blo-Fan" is believed to be the most important forward step in air-movement engineering in many years. It provides a *maximum* of air movement with a *minimum* of power—and at lower revolutions per minute than a blower of equivalent capacity could be operated efficiently.



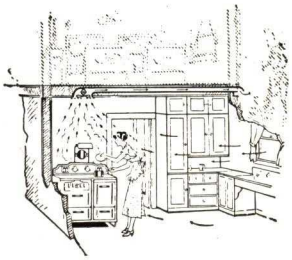
Installation Data

Housing frames in prior to plastering; is 11¾x11¾ in. square and 8 in. high over all; round hole through ceiling is 9¾ in. in diameter; exhaust port takes standard 3½x10-in. furnace pipe. Packed with *either* the elbow *or* the exterior wall cap. (Specify No. 211 for ventilator with elbow, No. 212 with wall cap. Ducts and roof jacks are *not* furnished.) Provide regular 2-gang wall box for switch and speed control.



Typical Method of Vertical Ducting (Uses No. 211 Unit)

Typical Method of Horizontal Ducting (Uses No. 212 Unit)



Advantages of Ceiling Ventilation

Fresh air naturally enters the kitchen through the doors and windows, is heated over the stove and then tries to push its way out through the ceiling. A *ceiling* ventilator, therefore, is from 30% to 40% more efficient than a sidewall ventilator of similar capacity. In addition, it forms a "hood" out of air, thus protecting ceiling, walls, drapes, etc., from the grease stains which will be deposited if cooking steam is permitted to scatter and crystalize before it is exhausted.

Essential With Air Conditioning

Modern air conditioning makes imperative a complete and efficient removal of foul odors and greasy cooking steam before they can reach the return duct openings. "Blo-Fan" skims off and discharges this undesirable air.

Comparative Capacity

Tests made at the exhaust end of 18 ft. of duct (2 ft. horizontal and 16 ft. vertical, as a typical residence installation) showed that "Blo-Fan" delivered nearly 10% more air than a highly efficient *12-in.* breeze fan and 30% more than a standard squirrel-cage blower of similar speed and wattage. Static resistance in such a duct is relatively low, which makes breeze fan readings abnormally favorable when compared to blower readings. If headwind or atmospheric pressure is exerted, breeze fan efficiency drops rapidly, but "Blo-Fan" efficiency remains relatively superior to all other types.

Type of Motor and Guarantee

Motor is induction, cast aluminum, streamlined, with long-life oiling system; mounted on live rubber for silence. Fully guaranteed (windings by Westinghouse), with an enviable record of successful performance over 12 years. Specially designed thrust bearings running in oil.

In Combination With a Recessed Light

Also made in combination with a 100-watt recessed light, attached either to the end or a side of the power unit. Grille then covers both openings, making a very modern finished installation flush with the ceiling or top of hood. Light increases either width or length of power unit 6 ins., depending on whether attached to the end or the side of the ventilator. This arrangement makes it possible to point the discharge in any direction and still keep the ventilator-light grille in the desired position on the ceiling.

SIGNAL ELECTRIC MFG. CO.

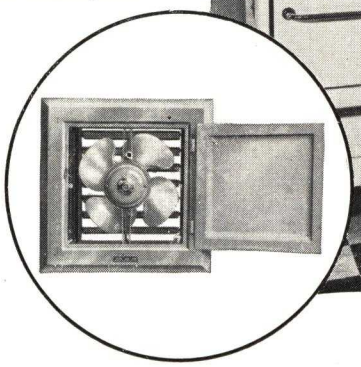
MENOMINEE, MICHIGAN

SIGNAL — MANUFACTURERS OF ELECTRICAL PRODUCTS

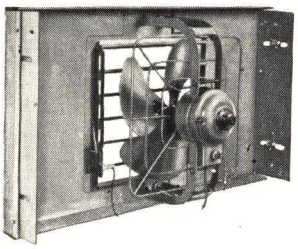
Automatic Kitchen Ventilating Fan

Adjustable to wall thickness, easy to install, no metal or wood frame necessary; no screws in plaster, wood, or brick needed to install, 10-inch quiet type fan—available for alternating or direct current; alternating current type non-radio interfering. Attractive finish — inside and outside frames are polished cast aluminum—adjustable wall box is steel. Automatic switch and shutters are controlled by opening and closing door. Opening door starts the motor, as illustrated here, and opens shutters. Closing door stops motor and closes shutters.

Descriptive bulletin on request.



No.	Voltage	C.f.m.	Watts	For walls, in.	Shipping weight, lbs.
V-30	110 a.c.	600	50	7 to 13	25
V-31	110 uni.	680	65	7 to 13	25
V-30s	110 a.c.	600	50	13 to 24	52
V-31s	110 uni.	680	65	13 to 24	52



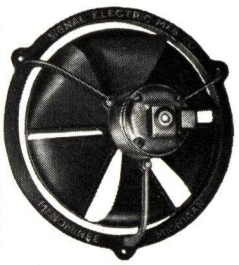
Adjustable Window Vent Fan

For windows from 24 to 37 in. in width. 10-in. quiet type polished aluminum fan blade, steel frame, weatherproof shutters, 10-ft. rubber cord and plug. Shutters are opened and closed from inside with a pull cord. Finish is French gray.

No.	Voltage	C.f.m.	Watts	Shipping weight, lbs.
V-24A	110 a.c.	600	50	19¼
V-25A	110 uni.	680	65	18¼

Two-speed, wall mounting, lever type switch available for all Bucket and Flat Blade Vent Fans.

Bucket Blade Exhaust Fan

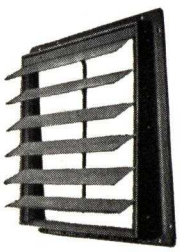


For commercial installations, or where displacement of large volume of air is desired. Quiet and economical in operation. Motor is shaded coil, self-cooling type, built into fully enclosed housing, equipped with reversible conduit box, bearings special leaded bronze with wool packing —black enamel finish.

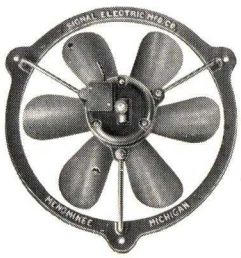
Size, in.	No.	Voltage	C.f.m.	R.p.m.	Shipping weight, lbs.
12	V-112	110 a.c.	700	1100	25
12	V-212	110 d.c.	700	1150	25
16	V-116	110 a.c.	1400	1150	36
16	V-216	110 d.c.	1400	1280	36
18	V-118	110 a.c.	2200	1100	40
18	V-218	110 d.c.	2300	1150	40

Automatic Shutters

For use with Signal Bucket and Flat Blade Vent Fans. Protect fan opening. Vanes made of aluminum are fastened to a tie-rod mounted in cast iron frame. Vanes open when fan starts and close when fan stops.



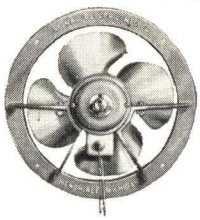
Size, in.	No.	Shipping weight, lbs.
12	L-12	11
16	L-16	18
18	L-18	23



Flat Blade Vent Fan

For offices, washrooms, kitchens, poultry houses, etc. Reinforced cast iron frame. Shaded coil fully enclosed motor. Black enamel finish.

Size, in.	No.	Voltage	C.f.m.	R.p.m.	Shipping weight, lbs.
12	V-1A	110 a.c.	720	1060	21
12	V-5A	110 d.c.	720	1330	21
16	V-2A	110 a.c.	1200	980	32
16	V-6A	110 d.c.	1200	1030	32



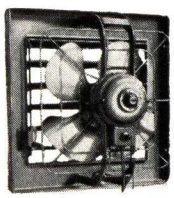
Ring Type Kitchen Vent Fan

For installations where weight must be considered this vent fan is recommended. Can be mounted on wallboard. Cast aluminum mounting ring; quiet type 10-in. polished aluminum fan blade, on-and-off switch and 10-ft. rubber cord and plug.

No.	Voltage	C.f.m.	Watts	Shipping weight, lbs.
V-105	110 a.c.	600	50	12
V-106	110 uni.	680	65	12

Built-In Type Vent Fan

For permanent installation. Equipped with 10-in. quiet type polished aluminum fan blade and 10-ft. rubber cord and plug. Steel frame with weatherproof shutters. Shutters are opened and closed from inside by a pull cord. Finish is French gray.



No.	Voltage	C.f.m.	Watts	Shipping weight, lbs.
V-24A-BT	110 a.c.	600	50	12¼
V-25A-BT	110 uni.	680	65	11

B. F. STURTEVANT COMPANY

Heating, Ventilating, Air Conditioning and Vacuum Cleaning Equipment

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The Cooling and Air Conditioning Corp., division of B. F. Sturtevant Company, Hyde Park, Boston, Mass.

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Engineering Service

Each of the above offices maintains a staff of trained engineers who are always at the seryice of Architects and Consulting Engineers to discuss air handling equipment, and to make recommendations for suitable apparatus.

Silentvane Fan

Backwardly curved blade type. A ventilating fan to meet the most exacting specifications, where very high efficiency and exceptionally low power consumption are required.

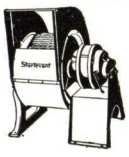
Multivane Fan

Forwardly curved blade type. A highly efficient centrifugal ventilating fan of sturdy construction to meet the general run of ventilating requirements.

Rexvane Fan

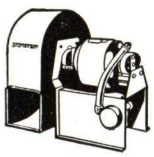
The modern paddle wheel. Correct inlet blade curvature and stream line shrouding retain all good features of the old paddle wheel and greatly increase capacity.

Convertible Multivane Fan



This is a low speed centrifugal type fan with convertible and reversible housing, permitting quick conversion to any horizontal or vertical discharge.

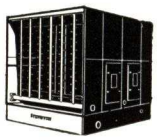
Ventilating Set



Direct connected; motor driven. For use with ducts, in ventilating small rooms, laboratory hoods and, in general, any room up to 10,000 cu. ft. contents.

Sturtevant
REG. U. S. PAT. OFF.
Puts Air to Work

Air Washer

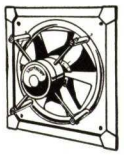


Built in several types to meet varying requirements in cleaning, cooling, dehumidifying and humidifying air.

Filticooler

A compact, highly efficient, sectional type air washer. For filtering, washing, humidifying, cooling, and dehumidifying. Principally for public buildings and factories. Range of sizes.

Propeller Fan



Built in fan sizes from 12 up to 45 in. Electric motors are available for both alternating and direct current, in wide variety of voltages.

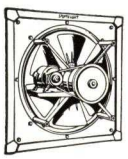
Pent House

Sheet steel construction, with angle-iron framework. Includes automatic shutter. Made in range of sizes for Sturtevant Design 5 and Design 7 Propeller Fans.

Unit Ventilator

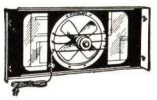
A combined steam heating and ventilating unit widely used in schools and other places. Finished in duco of any standard color. Stainless steel trim.

Attic Fan



A propeller type fan for installation in the attic, for house cooling and ventilating. Range of sizes. Motors for various voltages, for a-c. and d-c.

Kitchen Type Propeller Fan



Complete with switch, cord and plug with or without adjustable panel. Panels all-metal or with glass windows. Fan dia., 10 in. Motors, 110 volt, a-c. or d-c.

Built-in Kitchen Type Fan

Consists of fan section and shutter section. These sections are fastened to wood frames built into wall by contractor. Fan: 10 in. diameter, 600 c.f.m. Motors: 110 volt, a-c. or d-c.

Suspended "Speed Heater"

Wall or ceiling installation. Fin type heating element. For all steam pressures up to 200 lbs. Capacities up to 329,000 B.t.u.

Rexvane "Speed Heater"

Floor, wall, or ceiling installation. Fin type heating element. For steam pressures up to 200 lbs. Capacities up to 1,421,000 B.t.u.

Electric Motors

AC and DC Traction and integral horsepower sizes. For general purposes and special application.

WEST WIND CORPORATION

Airport Way at Grand Street, SEATTLE, WASH.

WEST WIND KITCHEN EXHAUST FAN

Special Advantages

1. The fan of the West Wind is removable without tools or disassembling. It is readily taken down and its wheel and the interior of its casing easily cleaned of the grease that is found to accumulate. Thus the West Wind can be kept as clean as other kitchen equipment. Being removable, the fan has a "plug-in" connection. Outlet near top of casing should be specified.

2. West Wind motors are not ordinary desk fan motors; they have only one-third of the usual clearance or "play" in the bearings. They have an oiling system with reserve lubrication that has operated a stock fan continuously for two years, day and night, without attention.

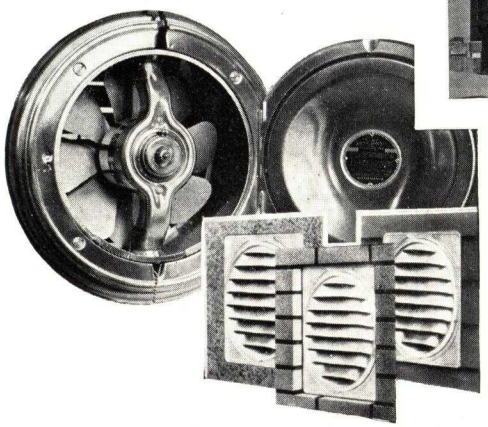
"West Wind" is the original copyrighted name of this character as applied to kitchen ventilating equipment. Others that are sufficiently similar to cause confusion are infringements and will be prosecuted.

3. From the standpoint of efficiency West Wind's eight deep-pitched blades permit a smaller casing assembly without sacrifice of capacity. This allows installation in restricted spaces, and an attractive design and finish difficult to attain in larger bulk.

Prominent Architects Who Endorse the West Wind Fan

Ernest Flagg, New York, N. Y.
Donald Johnson, Washington, D. C.
Murray D. Hetherington, Chicago, Ill.
Cay G. Weinel, St. Louis, Mo.
J. Roger Musick, Denver, Colo.
Arthur Loveless and Lester Fey, Seattle, Wash.
Paul R. Williams, Los Angeles, Cal.

Buildings Five and Six of the New Flagg Court Apartments, Brooklyn, N. Y.
450 West Wind units installed
ERNEST FLAGG, Architect and Owner

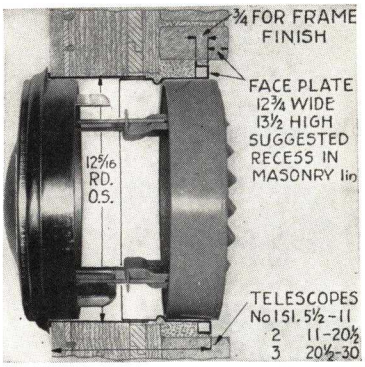


No. 301—Assembly without telescoping sleeve Can be installed on a 11⅛-in. round opening in any kind or thickness of wall.

The West Wind Standard

The removable fan assembly is reversible and has a two-speed motor operated by a pull-chain switch. Its inside door and casing have a "brushed silver" finish and, when closed, give a trim, wall-safe appearance.

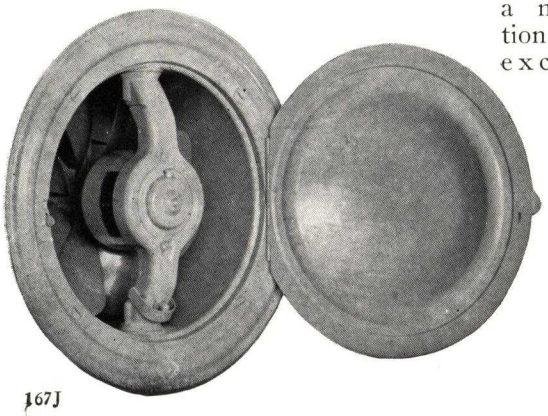
We also make a West Wind Junior for sidewall, ceiling or under-cupboard installation.



No. 101—Assembly complete with telescoping sleeve for wall of any thickness.

THE VENTAIR EXHAUST FAN

Specially designed for use *in quantities* on apartment or group house projects where walls are uniform and low cost is important. The new model incorporates a modification of the exclusive West Wind removable-for-easy-cleaning feature. Fixed or automatic louvres. Totally enclosed motor with oversize shaft and bearings and special West Wind lubrication. Eight blades. Finished in white or ivory lacquer. Easily installed. Inside door gives wall-safe appearance.



167J

Specifications:

A—¾ in., for siding, shingles or stucco.

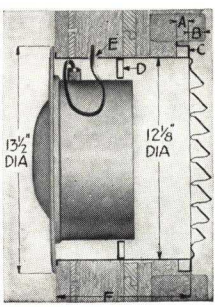
B—1 in., suggested recess in masonry.

C—Face plate 12¾ in. wide, 13½ in. high. To secure in wall grout in mortar or nail against sheeting.

D—Ring for holding sleeve round and to enclose wiring.

E—Knockout for service wire on top, bottom, and both sides.

F—Over-all length of sleeve from face of plaster. In ordering give this dimension.



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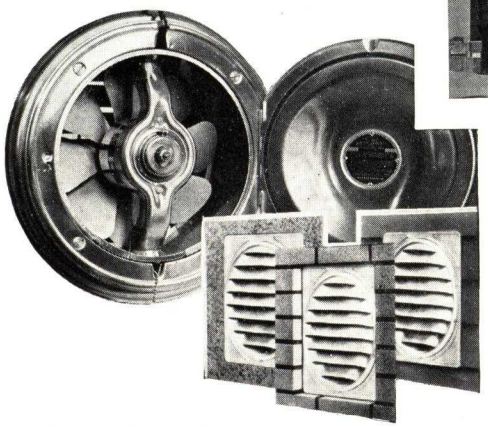

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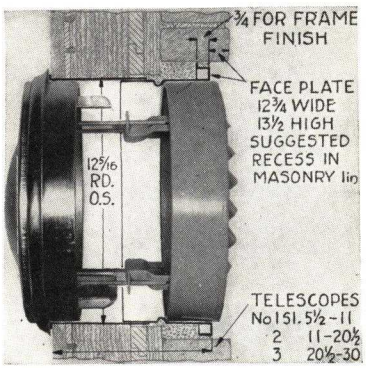

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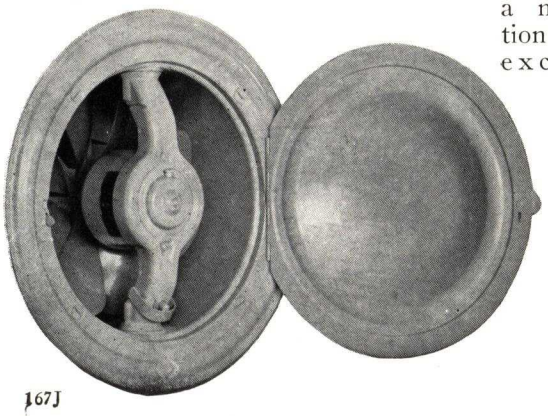

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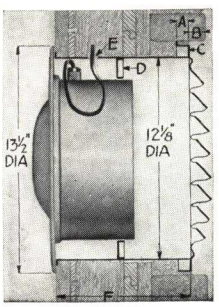
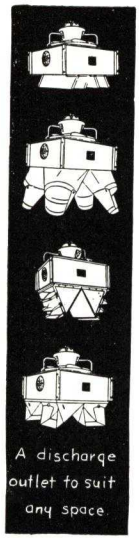


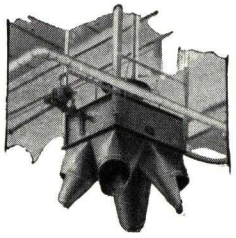
L. J. WING MFG. CO.

51 Seventh Avenue, NEW YORK, N. Y.

WORKS: NEWARK, N. J. BRANCH OFFICES IN PRINCIPAL CITIES

Wing Featherweight Unit Heaters Floodlights of Heat





Low heating cost and uniform diffusion of comfortable warmth are two features in which WING Floodlight Heating excells all other systems.

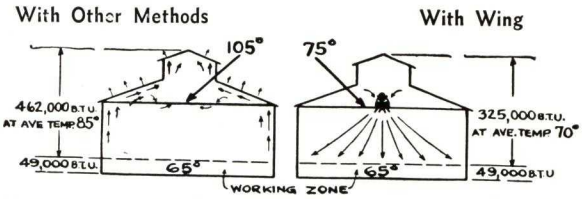
Located near the ceiling or roof, they prevent accumulation of hot air in the upper spaces with the accompanying costly waste of heat that is suffered with other systems.

They project the air, comfortably warmed, to the working area where the heat spreads to every point. Vertical downward discharge from multiple outlets at proper velocity assures even distribution.

The lightness of the units permits their suspension directly overhead in any location. Furthermore, one large WING unit with multiple discharge takes the place of several one-direction heaters at less cost for units, piping, wiring and installation.

There is a type for every condition from low ceilings to installations as high as 55 ft. from the floor.

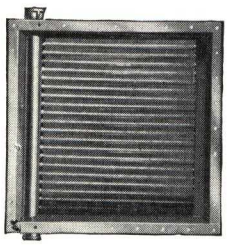
They make use of the WING Featherfin Heating Element described below. Bulletin H-6A.



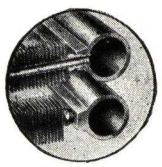
137,000 less B.t.u. is lost above the working zone with WING Featherweight Unit Heaters.

(Based on a 35° day)

Wing Featherfin Heater Sections



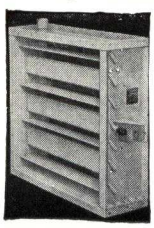
For heating air for any purpose by steam or hot water. The WING Featherfin Heating Element, used in these sections, is extremely light in weight. For equal heat transfer, it offers less resistance to air flow than any other element on the general market. It is of the tube-and-fin extended-surface type. The hairpin shape of the tubes avoids strains caused by expansion and contraction. Each tube is easily replaced in case of accidental damage.



Detail of Wing Featherfin Heating Element—Showing Compression union tube connection

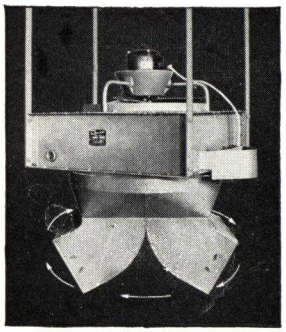
The sections are tested at 1000 lbs. pressure. They are available for any desired final air temperature. Are used separately for any heating purpose and in WING Unit Heaters. Bulletin H-6A.

Wing Variable Temperature Featherfin Heater Sections



These sections will deliver air at any temperature from the maximum obtainable with the prevailing steam pressure down to the temperature of entering air. Invaluable in supplying fresh air for space heating or process work where close control of temperature must be maintained. Either manual or automatic control. Obtainable separately or in combination with WING Heaters. Bulletin VT-2.

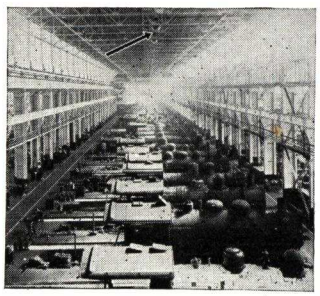
Wing Revolving Discharge Featherweight Unit Heaters



Operate on an entirely new scientific principle of heating that projects uniformly and comfortably warmed air to the walls and remote corners of the plant. Eliminates difficulties encountered in certain plants where machines or other equipment would permanently or temporarily obstruct the flow of heat from a fixed discharge—a condition that cannot exist with this new, constantly moving, slowly rotating discharge.

These heaters have been giving entire satisfaction in some of the most trying situations, as for instance, on fruit piers where even temperatures are essential—where "hot" spots would be disastrous. This discharge supplements the list of eight different designs of standard discharge outlets available for WING Featherweight Unit Heaters. Bulletins W-229 and H-6A.

Note how every part of the heat is diffused to the plant

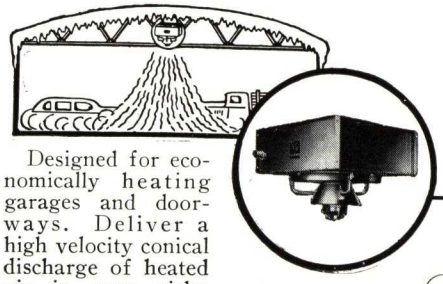


Locomotive shop, with Wing Heaters 56 ft. high

Revolving Discharge Heaters in airplane plant

Wing Utility Heaters

A lightweight suspended unit heater for delivering heated air in one general direction. Has the same powerful fan and rugged heating element as WING Featherweight Unit Heaters. This is the latest refinement of the original horizontal light-weight heater which was developed by WING and was the forerunner of all modern unit heaters. Bulletin U-4.

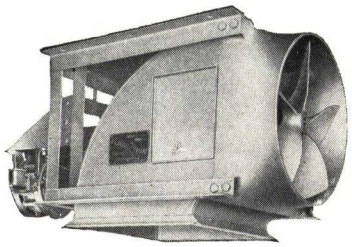


Wing Garage and Door Heaters

Designed for economically heating garages and doorways. Deliver a high velocity conical discharge of heated air in open aisles and open doorways that actually heats up the cold air as it enters and causes the warm air to roll along the floor in every direction. Bulletin G1 (Garage), D1 (Door).

Wing-Scruplex Exhausters

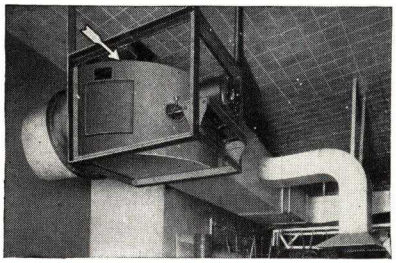
For economically moving air wherever ducts are used. It combines the efficient WING-Scruplex Propeller Fan with a housing of convenient form which places the motor entirely outside the air duct. The motor and drive remain cool and clean and are easily accessible.



Particularly valuable in exhausting air containing paint spray, dirt, dust, grease, vapors, gases, steam heat, explosive mixtures, etc.

The powerful WING-Scruplex Fan delivers high air volume with low power consumption against any pressures for which duct systems should be designed. V-belt drive permits the most economical fan speed to meet any conditions of air volume and duct resistance.

The exhaust is built in the form of an elbow and is used as such. Light, compact and easy to install, it fits into tight places and can be mounted horizontally or vertically, by hanging from the ceiling or by bolting to ceiling, wall or floor. No expensive foundation is needed for this lightweight unit.



Made in a complete range of sizes from 10 to 60 in. and for 500 to 70,000 cu. ft. per min. Bulletin E-70.

FAN SPEEDS AND HORSEPOWER FOR VARIOUS C.F.M. DELIVERIES AND STATIC PRESSURES FOR WING-SCRUPLEX EXHAUSTERS

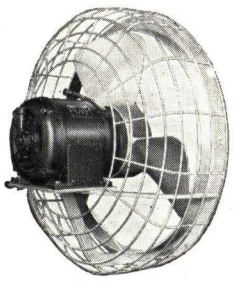
Cubic feet per minute	Exhauster No.	0.0″ Static Pr.		0.1″ Static Pr.		0.2″ Static Pr.		0.3″ Static Pr.		0.4″ Static Pr.		1.8″ Static Pr.		20″ Static Pr.	
		R.p.m.	Fan hp.	R.p.m.	Fan hp.	R.p.m.	Fan hp.	R.p.m.	Fan hp.	R.p.m.	Fan hp.	R.p.m.	Fan hp.	R.p.m.	Fan hp.
2000	2	1617	0.16	1712	0.19	....	....	....	....	....	....	....	....	....	....
	3	850	0.08	1030	0.13	1190	0.22	1305	0.32	1425	0.44	....	....	....	....
	4	640	0.05	806	0.08	925	0.12	1042	0.19	1146	0.25	....	....	....	....
	5	433	0.02	610	0.11	780	0.16	897	0.26	980	0.38	1780	2.83	....	....
10,000	6	1166	1.28	1240	1.62	1301	1.87	1373	2.20	1435	2.56	....	....	....	....
	7	720	0.61	775	0.80	835	1.04	900	1.34	970	1.72	....	....	....	....
	8	362	0.19	437	0.45	502	0.70	563	1.10	622	1.58	1150	13.3	....	....
	9	239	0.11	310	0.40	375	0.80	445	1.30	506	1.93	966	16.5	....	....
20,000	7	1436	4.67	1462	5.35	....	....	....	....	....	....	....	....	....	....
	8	720	1.52	760	2.00	800	2.53	834	3.08	870	3.65	....	....	....	....
	9	478	0.85	527	1.41	569	1.95	608	2.48	650	3.08	....	....	....	....
	10	335	0.53	390	1.10	430	1.70	473	2.10	507	2.70	923	22.8	967	26.4
	11	243	0.36	305	0.80	350	1.40	387	2.20	424	3.10	794	23.4	830	28.8

This is part of a table for quick selection of WING-Scruplex Exhausters to fit any condition of air volume and duct resistance. The space available here permits showing only a small portion of the table. The complete table, which is published in Bulletin E-70 shows the fan speed and horsepower for air deliveries from 200 to 70,000 cu. ft. per min. at static pressures from zero to 2 inches.

Wing-Scruplex Safety Ventilating Fans

A propeller type fan that delivers air against static pressure, quietly and efficiently. The true screw design of the fan wheel propels air in straight and parallel lines at uniform velocity over the entire area. Eddy currents are therefore reduced to a minimum, the result being quiet, smooth and efficient operation.

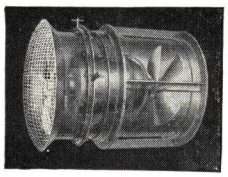
A heavy welded steel guard is fastened to the fan frame. It is designed to provide perfect safety without reducing the efficiency of the fan.

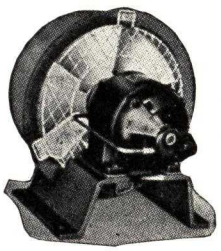


Where it is not expedient to use direct-connected motor driven fans, WING-Scruplex Safety Pulley-Driven Fans may be employed. Bulletin F-5.

Wing High Pressure Motor Driven Blowers

When applied to high pressure boilers produce high static pressures at low speed. Can be placed in boiler wall and often completely eliminate duct work. Integral damper mechanism permits variation of air delivery over a wide range with decreasing horsepower. Volumes up to 100,000 c.f.m. Static pressures to 7 in. Bulletin CO-2.



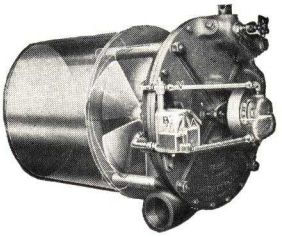


Wing Motor Driven Blowers For Forced Draft

The installation of WING Motor-Driven Type EM Blowers and Combustion Control on boilers of all sizes makes possible use of inexpensive fuels with great savings which usually pay for the blowers in the first year of operation. Increased capacity with minimum attendance. Firing intervals as long as 24 hours. For hand or stoker fired, oil or pulverized fuel boilers. Bulletin M-76.

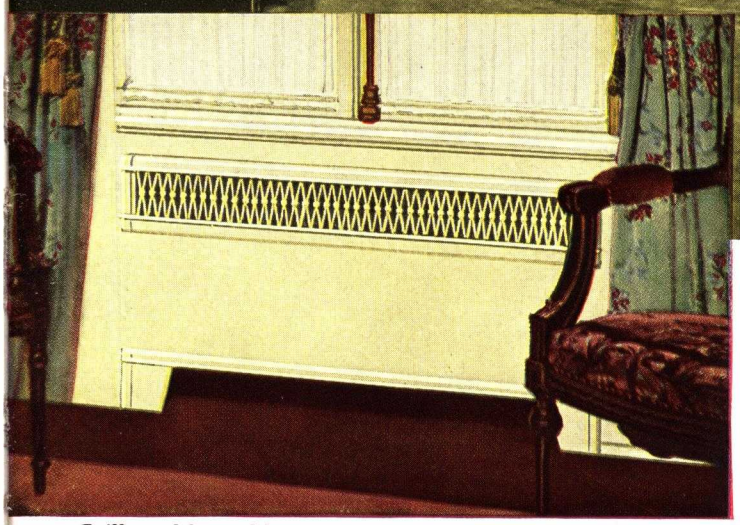
Wing Turbine Blowers

For economically supplying forced draft for hand or stoker fired high pressure boilers. Greatly increased boiler capacity, flexibility of control and thorough combustion of low cost fuels are obtained. Require little floor space. Easily installed. Effect great savings. Exhaust steam from turbines can be used for heating buildings or feed water or for processing purposes. Bulletin T-97.



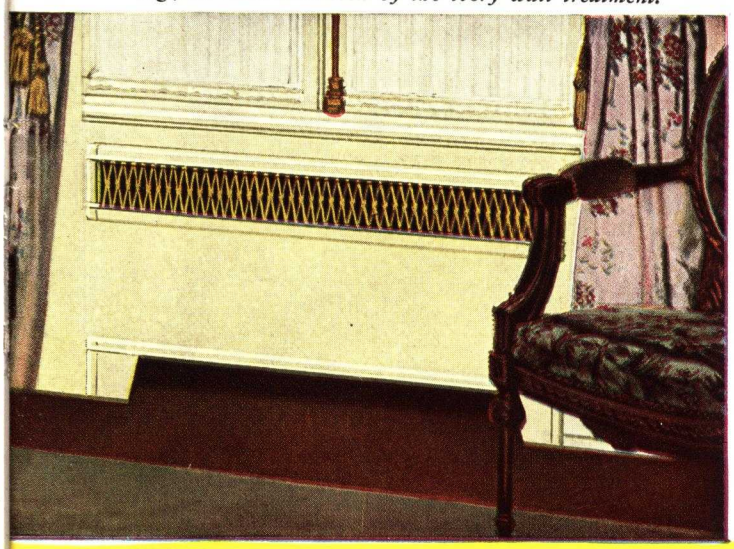
MEMORANDA

In this Louis XVI room the Concealed Type Convector with its ornate Empire design grille pleasingly reflects the spirit of the period furnishings.



Grille and framed lower opening, attractively finished in ivory, blend perfectly with the ivory wall treatment.

Gold-plated grille harmonizes with the period furnishings, its color enhanced by the ivory wall treatment.



Beauty

IN

MODINE

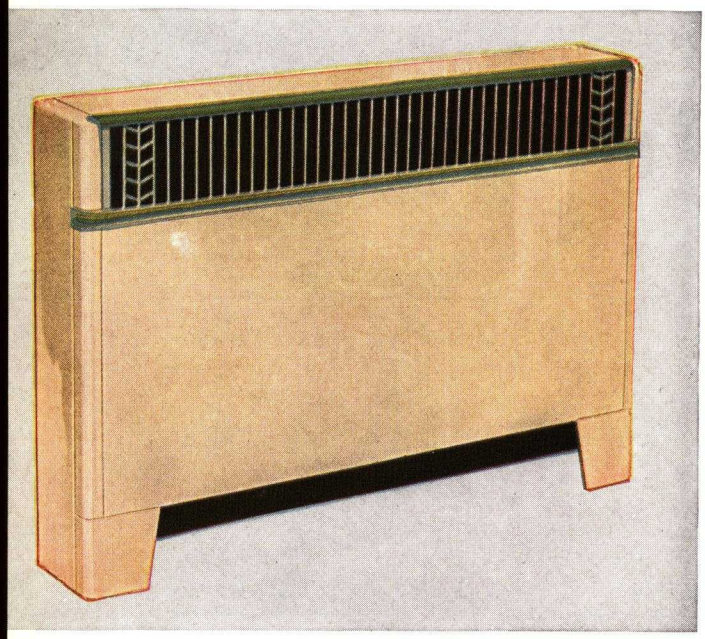
CONCEALED RADIATION

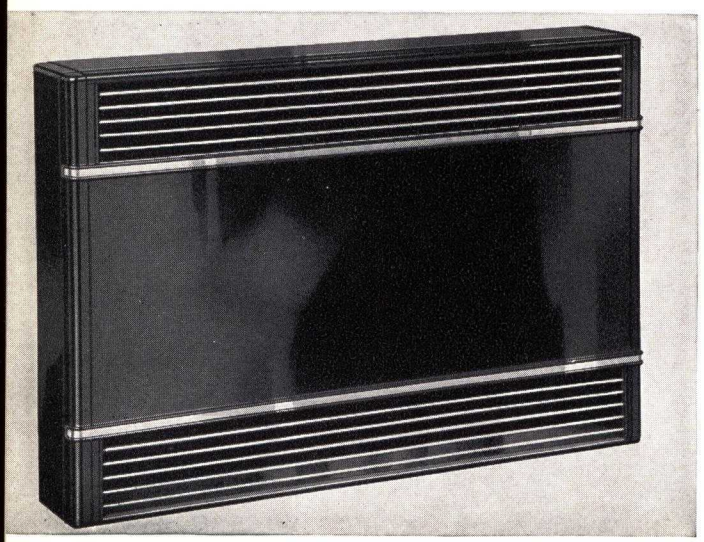
Bulletin 237-B

Copyright Modine Mfg. Co.—1937

MODINE MANUFACTURING COMPANY, RACINE, WIS.

With Modine's smart Modern Venetian Grille, the Modine Wall Cabinets conform in a most pleasing manner to the modern trend shown in office appointments





For architect-designed buildings, CONVECTORS with enclosures and grilles that HARMONIZE with ROOM INTERIORS

● Truly beautiful designs . . . embodying a new idea of styling . . . have been created for the new Modine Concealed Heater enclosures and grilles, by a nationally known furniture stylist.

● The virtual custom-built flexibility of grille design . . . *patented and exclusively Modine* . . . allows the architect new and individual freedom of expression. By means of variations and combinations of the four elementary grille designs (shown below) he may *at no extra cost* choose a grille to harmonize with any style, period, or special requirement, of the interior appointments of the finest homes, offices, hotels, or public buildings.

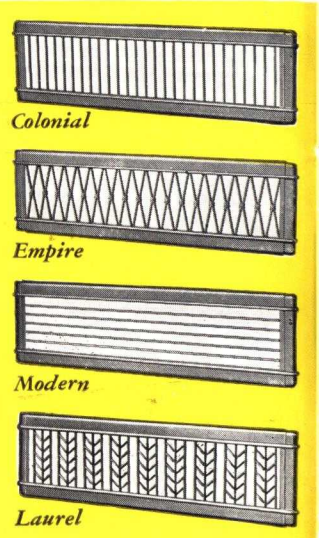
● Modine grilles are die castings having actual weight and depth. Being non-corrosive, their beauty may be still further enhanced by a plating appropriate to the style or period of the interior, and the design of the grille used. *At slight extra cost* any of Modine's concealed heater grilles may be supplied in Colonial Brass, Antique Silver, Statuary Bronze, 24K. Gold, or Polished Chrome plated finishes.

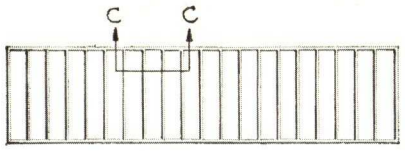
FOUR ELEMENTARY GRILLE DESIGNS

The number of grilles which may be created through the combination of the four elementary grille designs is limited only by the versatility of the architect or the requirements of the individual room. For example, the Modern Venetian grille of the Wall Cabinet Convector shown at top of page is a combination of the elementary designs, Modern and Laurel. The Colonial Classic upper grille of the Floor Cabinet Heater, shown at upper left, is a combination of the Colonial and Laurel. Floor Cabinet Convector at lower left is equipped with Modern grilles. Unless otherwise specified Modine Convectors will be furnished with Colonial grille and framed lower opening (except wall cabinet type which requires no bottom grille).

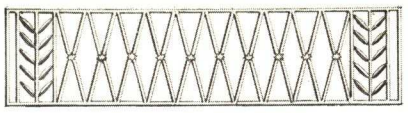
FOUR TYPES CONVECTOR ENCLOSURES

Four Modine Convector Enclosure Types are available—*Concealed* (shown on preceding page); *Wall Cabinet* (shown at top of this page); *Floor Cabinet* (shown in two cuts at left); and *Recessed* (shown on page 5). All enclosures are planned with an eye to color treatment adaptability. Rails and stiles have been put on different levels from each other and from main panels, so that color treatment may be effectively and inexpensively applied.

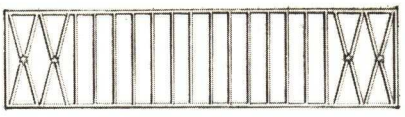




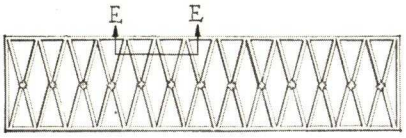
COLONIAL



EMPIRE CLASSIC



REGENCY CLASSIC



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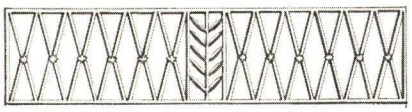

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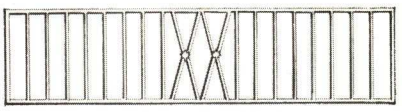
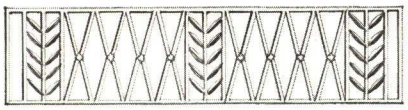


REGENCY MEDALLION

MODERN



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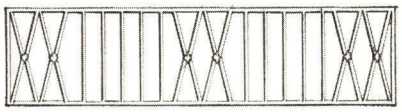
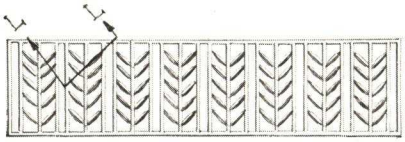
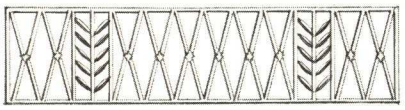


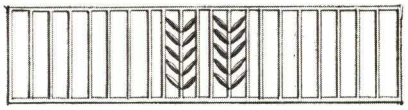
REGENCY VENETIAN



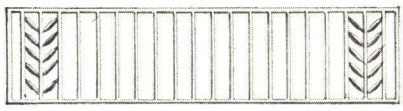
LAUREL



EMPIRE LAUREL

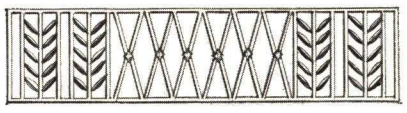


COLONIAL · DUAL MEDALLION

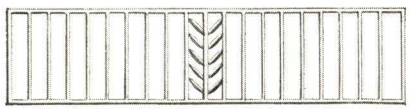


COLONIAL CLASSIC

MODERN CLASSIC

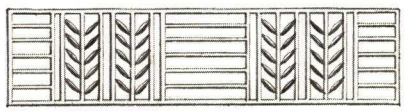


EMPIRE · DUAL · CLASSIC

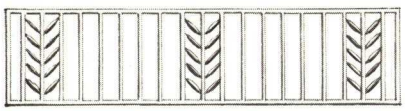


COLONIAL MEDALLION

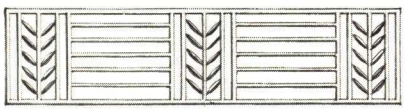
MODERN · MEDALLION



MODERN DUAL LAUREL



COLONIAL · VENETIAN



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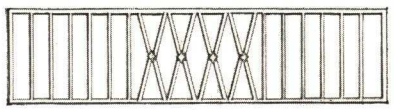
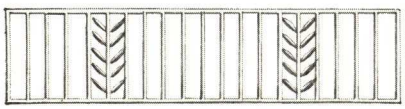


REGENCY · DUAL MEDALLION



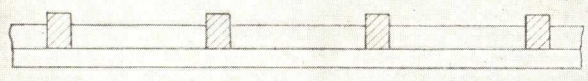
COLONIAL LAUREL

MODERN LAUREL

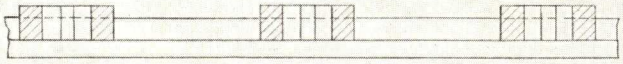
BASKET · WEAVE · MEDALLION

Note: The Basket-Weave Medallion and the Modern Dual Laurel cannot be furnished in a grille less than 22½ inches in length.

TRUE CROSS SECTIONS OF CAST GRILLES TO ACTUAL SCALE

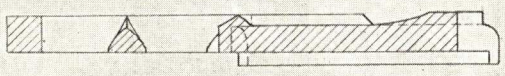


SECTION · C · C



SECTION · E · E

SECTION · M · M

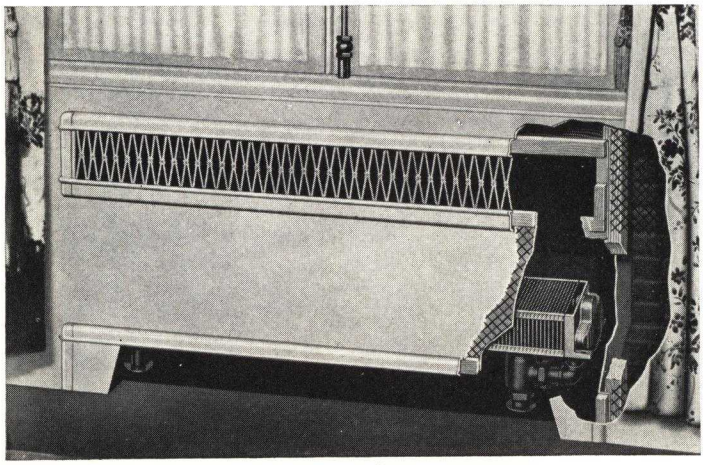


SECTION · L · L

MODINE CAST GRILLES HAVE DEPTH AND WEIGHT

THE MODINE FULLY CONCEALED TYPE CONVECTOR

The Modine Concealed Type Convector, illustrated on the front cover, is the truest concealed heater obtainable. As the front cover illustration clearly shows, the only parts which are visible are the grilles (or lower framed opening). All other parts of the convector assembly are installed in the wall behind the plaster.



Cut-away view of the Concealed Convector

Only with a copper convector can this degree of concealment be safely obtained—because only with a copper convector can a concealed installation be made in such a manner that the heating unit itself can be removed without disturbing the wall or its finish.

The Concealed type convector consists of a Modine copper heating unit, a steel enclosure and its separate front sheet for housing the heating unit and designed for installation in the wall behind the plaster, and two cast grilles—one for admission of room air, the other for delivery of heated air.

Installation is quickly and easily accomplished. In the earlier construction stages of a building, a recess is left in the wall which is of a depth, length and height to properly receive the convector assembly. The steel enclosure is placed into the recess and nailed through each side to the wood studding with which this recess is customarily framed. The Modine copper heating unit is then placed within the enclosure and the proper piping and fittings brought up to the unit so that the bottom of the unit is not over six inches above the floor.

After the piping has been completed, the plaster backing sheet is placed across the open face of the enclosure and fitted so that it covers the wall recess and leaves horizontal openings at the top and bottom of the enclosure. These openings, framed with wood ground-strips, receive the grilles.

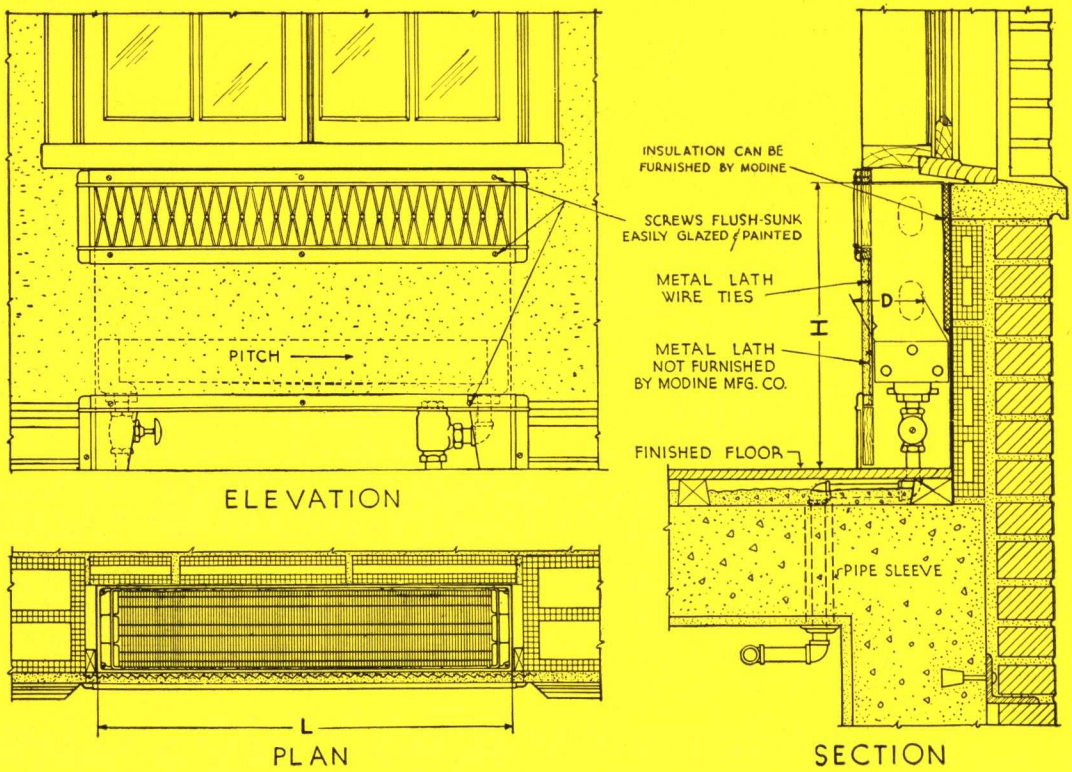
After the front is in place, metal lath and plaster can be carried across the face of the enclosure front. Wire ties spot welded to the front serve as anchors for the metal lath, and the wood ground strips (furnished by Modine) framing the grille openings serve as plaster stops.

After plastering is completed, the grilles are installed on the ground strips by means of wood screws inserted through flush-sunk holes along the perimeter of the grille frames.

Unless another grille combination is specified, the Concealed Convector will be regularly furnished with a Colonial upper grille and a framed lower opening.

For capacities and engineering data, see pages 8-12.

INSTALLATION DIAGRAM—CONCEALED CONVECTOR



For explanation of "L," "H" and "D" see Capacity Table, page 8.

THE MODINE RECESSED TYPE CONVECTOR

The Modine Recessed Convector is also an in-the-wall type and has been developed to serve the same general application as the Concealed type. It, however, does not require plastering across its face and it occupies less space in the wall than the Concealed type.

With less depth of wall recess, a convector unit of greater heating capacity can be employed. This is possible because the front extends about 1½″ from the wall. Therefore, although the heating unit may be 1½″ deeper than the rear half of the enclosure, this difference is accounted for by the slight projection of the front from the wall. This frequently results in lower installation costs where only one convector need be placed in a room where two would otherwise be necessary.

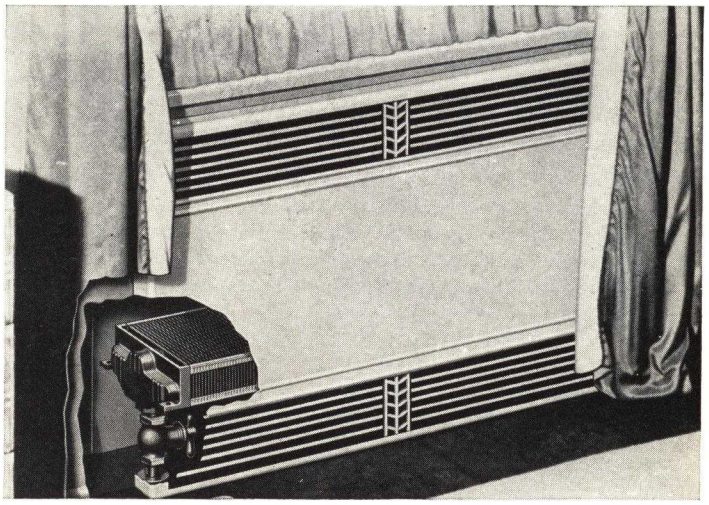
Inasmuch as convectors are properly placed beneath windows, the projection forward gives a pleasing panelling effect and generally just equals the depth of baseboard and of window sill forward of plaster line. The Modine Recessed Convector front trims itself; no moulding is required.

The Recessed type convector consists of a Modine copper heating unit, a steel enclosure for housing the heating unit in the wall, and a heavy steel front that completely covers the enclosure and the wall recess in which it is installed, overlapping plaster line with a box flange and self-trimming The cast outlet and inlet grilles are integral parts of the enclosure front.

Since the enclosure is flanged along the front edge of the top and along the sides so that it does overlap the edges of the wall recess left by the general contractor, the Recessed type enclosure may be installed either before or after the plastering has been completed. It is permanently secured in place by nailing it to the studding that frames the wall recess, using as the nailing surface the flanged edges of the top and sides of enclosure rear half.

The copper heating unit is then placed in the enclosure and connected according to the character of the heating system.

Fastening the front of the enclosure in position completes the installation. This front has flush-sunk screw holes in the flanged faces of the rear half enclosure. Additional retaining screws across the top are concealed behind outlet grille but are easily accessible through this grille. Screws holding front pass on through flanges of rear half of enclosure and into framing, giving secure support to front. All necessary screws are furnished by Modine.



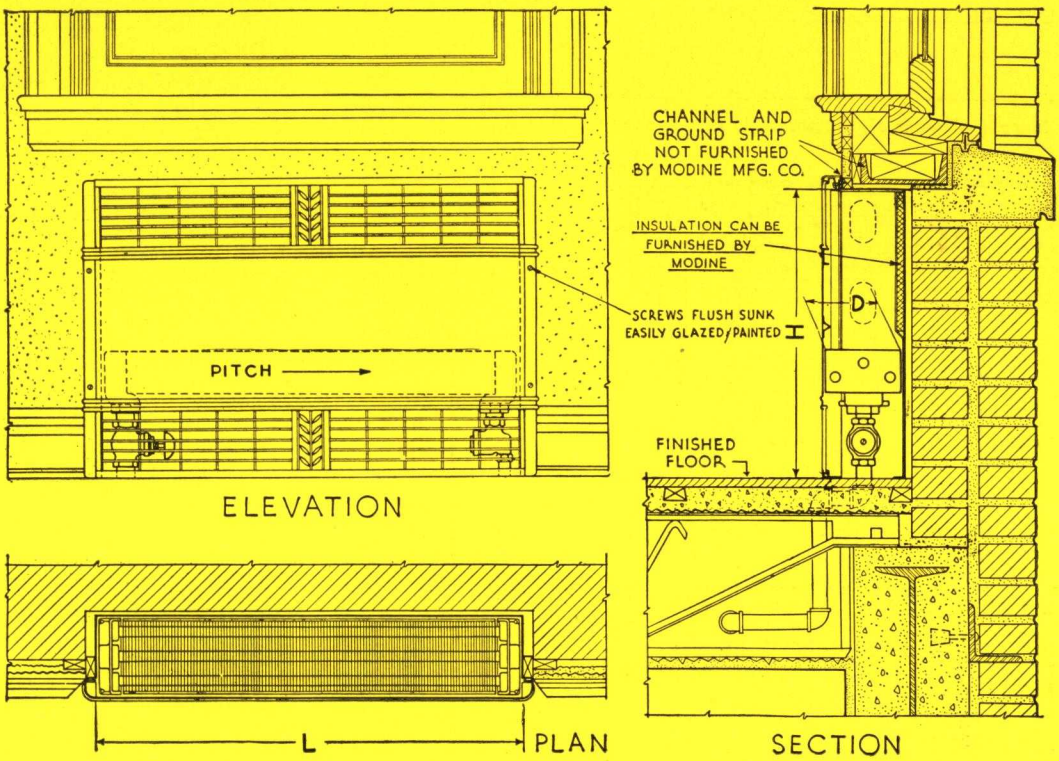
Cut-away view of the Recessed Convector

Painting with any desired color over the prime coat, which is applied at the factory, finishes the job.

Unless another grille combination is specified, the Recessed Convector will be regularly furnished with a Colonial upper grille and a framed lower opening.

For capacities and engineering data, see pages 8-12.

INSTALLATION DIAGRAM—RECESSED CONVECTOR



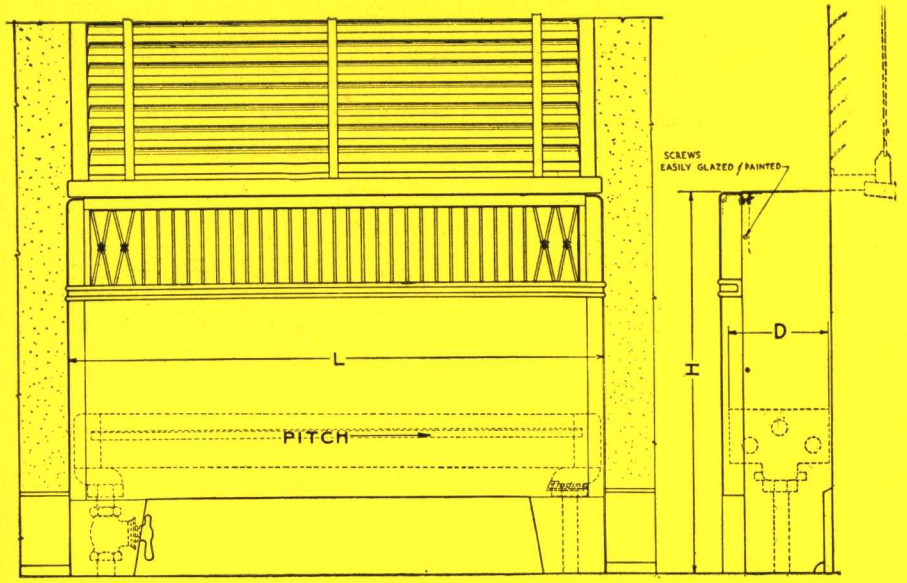
For explanation of "L," "H" and "D" see Capacity Table, page 8.

THE MODINE FLOOR CABINET TYPE CONVECTOR

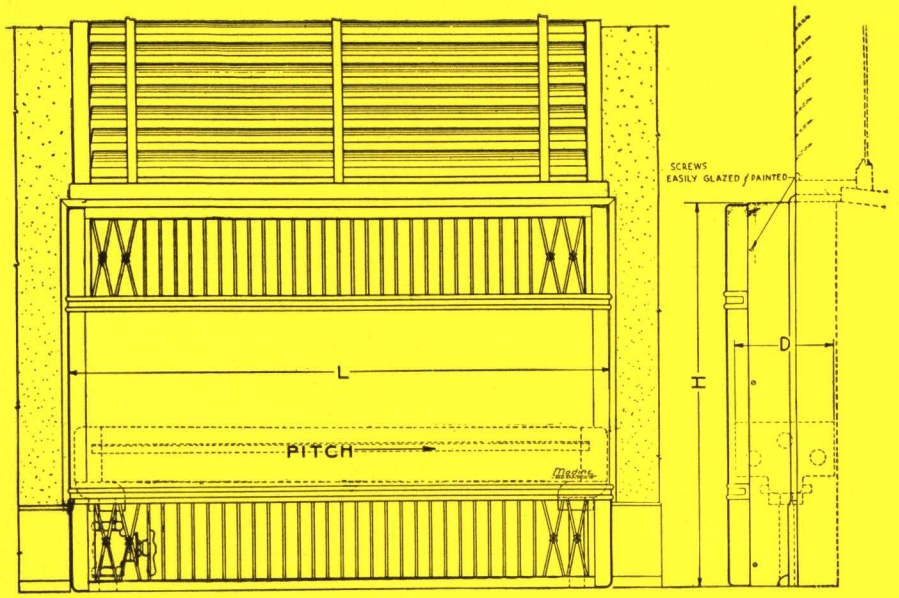
The Modine Floor Cabinet Convector has a wide range of applications in existing buildings as well as in contemplated construction. As it is primarily designed for open installation in a room—against a wall rather than in it—this convector is often specified where modernizing is being done and it is not desired to disturb existing wall construction. As will be illustrated later, the Floor Cabinet is nevertheless suitable for partial recessing in a wall and often answers the need for a semi-concealed installation which must deliver greater capacity than could be obtained from a Concealed or Recessed type occupying the same wall area.

The Floor Cabinet convector has three parts to its assembly—the copper heating unit, the rear enclosure half, and the front enclosure half or front which contains the outlet grille. An inlet grille is not often used with the Floor Cabinet inasmuch as the general contour of the lower part of the front forms a natural inlet for the incoming air. It can be furnished, however, and is particularly recommended where the fully Moderne effect is wanted.

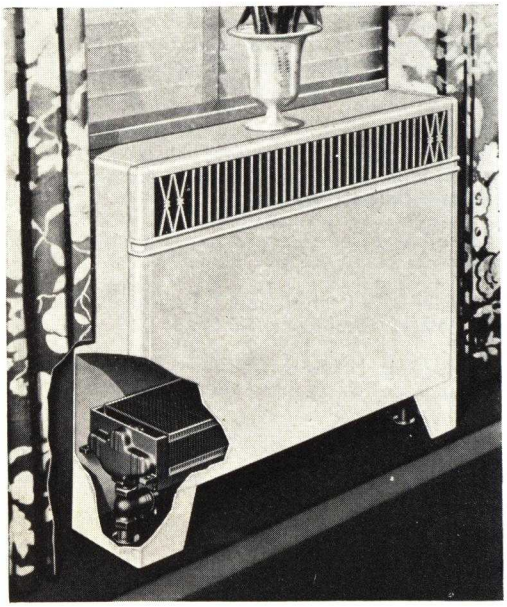
Installation of a Floor Cabinet convector is extremely simple. The enclosure rear half is first set in the desired location. The copper heating unit is then brought within the enclosure and connected with the steam or hot water piping that has been installed to serve it. The heating unit should not be over 6 in. above the floor. This done, the front is attached to the enclosure by screws inserted through several holes located in the sides which line up with similar holes on the sides of the rear half of the enclosure. Further fastening is accomplished through joining, by means of screws, a drilled flange welded to the underside of the beveled top of the front to a drilled flange welded to the underside of the enclosure top. Access to these screws is had through the upper grille. With the front secured in place the cabinet is ready for finish painting.



Installation Diagram—Completely Exposed Floor Cabinet Convector.



Installation Diagram—Partially Recessed Floor Cabinet Convector.
For explanation of "L," "H" and "D" see Capacity Table, page 8.



Cut-away view of completely exposed Floor Cabinet Convector

When the Floor Cabinet convector is to be installed partially recessed in a wall, the building contractor provides a wall opening of a depth that equals the distance to which it is desired to recess the cabinet. The enclosure should not be recessed so deeply, however, that the junction line between enclosure and front is concealed.

When installing a Floor Cabinet in a recess it is always advisable to allow a small opening—approximately 1/8 in.—between the enclosure and the plaster line. This will provide allowance for any expansion of the enclosure that might result from heating. This clearance space should then be trimmed by an appropriate moulding so as to present a finished appearance. (See Diagram at left.)

By recessing Floor Cabinets in this way it is possible to install a size, or two sizes, deeper heating unit without increasing the dimensions of the wall recess.

For capacities and engineering data, see pages 8-12.

On page 3 some of many available grilles are illustrated. All of these grilles are available for the floor cabinet. Unless some other grille combination is specified, however, this convector will be furnished with a Colonial upper grille and a framed lower opening. The Floor Cabinet convector cannot be furnished with top (horizontal) outlet grille except where the convector is 7 3/8 in. or greater in depth.

THE MODINE WALL CABINET TYPE CONVECTOR

The Modine Wall Cabinet Convector, illustrated on top of page 2 and on this page, has found its widest range of application in institutional and commercial fields. Designed for installation on the wall, it is an ideal type for offices, stores and school rooms where recessing is not practicable and easy cleaning of floors is demanded.

This type of convector fits in unusually well where modernizing is being done and where it is not desirable to make changes in the existing building construction. The general design of the Wall Cabinet lends itself particularly well to color treatment with the result that the Wall Cabinet unit can be made to harmonize with other appointments in the room, or stand out frankly in a color of its own.

The Wall Cabinet assembly consists of an enclosure, copper heating unit and front, the latter containing the outlet grille. Obviously with the Wall Cabinet type no lower grille is necessary.

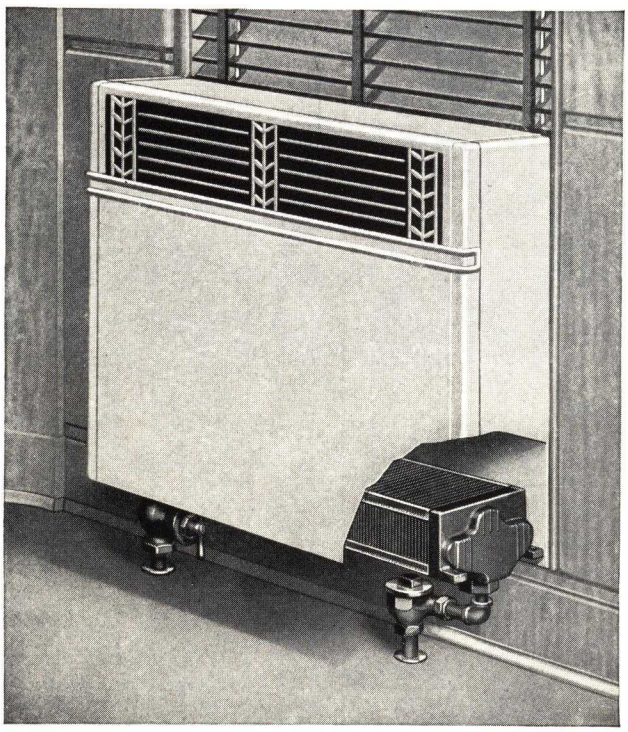
Before actually installing a Wall Cabinet Convector it is advisable to first place the enclosure at the desired location on the wall and then mark on the inside of the enclosure the places in which the screw fastenings are to be inserted. Holes can then be punched in the light metal covering perforated support strip. The enclosure is next fastened to the wall by means of wood-screws driven through the plaster to the wall studding.

The copper heating unit is then placed within the enclosure and connected with the steam or hot water piping that has been installed to serve the unit. The final installation should provide for bottom of heating unit being level with bottom of enclosure.

The front is then fastened to the enclosure by means of screws inserted through several holes located in the sides. Further fastening is accomplished by means of screws, to which access is had through the upper grille. With the front securely in place, the cabinet is ready to receive its final painting.

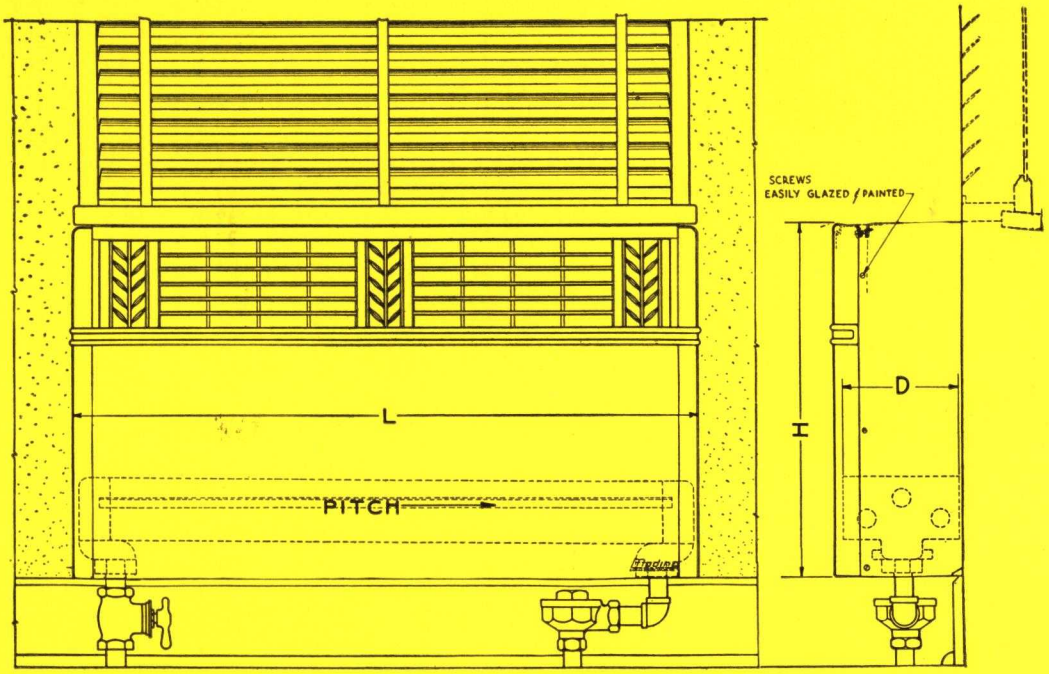
For capacities and engineering data, see pages 8-12.

Unless otherwise specified, the Wall Cabinet Convector will be regularly furnished with a Colonial grille as the air outlet.



Cut-away view of Wall Cabinet Convector

INSTALLATION DIAGRAM—WALL CABINET CONVECTOR



For explanation of "L," "H" and "D" see Capacity Table, page 8.

Note: The wall cabinet convector cannot be furnished with top (horizontal) outlet grille except where the convector is 7⅜ in. or greater in depth.

STEAM CAPACITIES*

CONVECTOR MNFRS. ASSN. CERTIFIED RATINGS BASED ON STANDARD CODE OF A.S.H.&V.E.

At 240 Btu. per Sq. Ft. Based on 215° Steam, 65° Entering Air.
Guaranteed for maximum pressure 50 lbs. saturated steam.

D = Depth of heating unit in inches	†L = Length of enclosure in inches	H = Height of Enclosure in inches for Concealed, Recessed, Floor Cabinet. See Diagrams at right												
		18	20	22	24	26	28	30	32	36	40	44	50*	70*
		H = Height of Enclosure in inches for Wall Cabinet. See Diagrams at right.												
		12¼	14¼	16¼	18¼	20¼	22¼	24¼	26¼	30¼	34¼	38¼		
		Capacity Sq. Ft.	Capacity Sq. Ft.	Capacity Sq. Ft.	Capacity Sq. Ft.	Capacity Sq. Ft.	Capacity Sq. Ft.	Capacity Sq. Ft.	Capacity Sq. Ft.	Capacity Sq. Ft.	Capacity Sq. Ft.	Capacity Sq. Ft.	Capacity Sq. Ft.	Capacity Sq. Ft.
‡3⅝	15	8.2	8.9	9.5	10.0	10.4	10.8	11.1	11.5	11.8	12.2	12.5	12.9	14.4
	17½	10.0	10.8	11.5	12.1	12.6	13.0	13.4	13.8	14.3	14.6	15.1	15.7	17.3
	20	11.8	12.6	13.3	14.2	14.8	15.2	15.8	16.2	16.7	17.2	17.7	18.3	20.4
	22½	13.3	14.5	15.3	16.2	17.0	17.5	18.1	18.5	19.1	19.7	20.3	21.0	23.4
	25	14.9	16.4	17.3	18.3	19.1	19.7	20.4	20.9	21.6	22.3	22.9	23.7	26.4
	30	18.5	20.1	21.2	22.4	23.5	24.3	25.0	25.6	26.6	27.3	28.0	29.2	32.3
	35	22.0	23.7	25.2	26.6	27.8	28.8	29.6	30.4	31.4	32.3	33.3	34.4	38.3
	40	25.3	27.5	29.1	30.8	32.1	33.2	34.2	35.1	36.3	37.4	38.4	39.9	44.3
	45	28.8	31.5	33.0	34.9	36.4	37.7	38.9	39.9	41.1	42.5	43.7	45.4	50.4
	50	32.3	34.9	37.0	39.1	40.9	42.2	43.5	44.6	46.2	47.5	48.9	50.7	56.3
	55	35.6	38.5	40.9	43.2	45.1	46.7	48.1	49.4	50.9	52.6	54.1	56.2	62.4
	60	39.1	42.4	44.9	47.4	49.5	51.1	52.6	54.1	56.0	57.9	59.3	61.5	68.4
5½	15	11.6	12.5	13.3	14.0	14.6	15.1	15.5	15.9	16.5	17.1	17.7	18.4	20.4
	17½	14.0	15.1	16.0	16.9	17.6	18.2	18.8	19.2	20.0	20.6	21.3	22.2	24.7
	20	16.4	17.7	18.8	19.8	20.6	21.4	22.0	22.5	23.4	24.2	25.0	26.0	28.9
	22½	18.8	20.3	21.6	22.7	23.7	24.5	25.2	25.8	26.9	27.7	28.7	29.8	33.2
	25	21.3	22.9	24.3	25.6	26.8	27.6	28.5	29.2	30.3	31.2	32.4	33.7	37.5
	30	26.1	28.2	29.8	31.4	32.8	33.9	35.0	35.8	37.2	38.4	39.8	41.3	46.0
	35	31.0	33.4	35.4	37.2	38.9	40.2	41.5	42.4	44.1	45.5	47.0	48.9	54.6
	40	35.3	38.6	40.9	43.0	45.0	46.5	48.0	49.0	50.9	52.6	54.4	56.6	63.1
	45	40.6	43.8	46.4	48.9	51.0	52.9	54.4	55.6	57.9	59.6	61.8	64.2	71.6
	50	45.4	49.0	52.0	54.6	57.2	59.0	60.8	62.3	64.6	66.8	69.0	71.9	80.2
	55	50.3	54.2	57.5	60.6	63.1	65.3	67.3	68.9	71.5	73.8	76.5	79.5	88.7
	60	55.0	59.4	63.0	66.3	69.3	71.7	73.8	75.5	78.4	81.0	83.9	87.2	97.3
7⅜	15	14.1	15.1	16.0	16.8	17.5	18.0	18.6	19.1	20.0	20.6	21.3	22.2	24.7
	17½	17.0	18.3	19.4	20.3	21.1	21.8	22.5	23.1	24.1	24.8	25.8	26.8	29.8
	20	19.9	21.4	22.7	23.6	24.8	25.6	26.3	27.1	28.3	29.2	30.2	31.4	35.0
	22½	22.8	24.6	26.0	27.2	28.4	29.3	30.2	31.1	32.4	33.4	34.6	36.0	40.6
	25	25.8	27.7	29.4	30.8	32.0	33.0	34.1	35.1	36.6	37.7	39.0	40.7	45.3
	30	31.6	34.0	36.1	37.6	39.3	40.5	41.9	43.0	44.9	46.3	47.9	49.9	55.5
	35	37.6	40.3	42.7	44.7	46.6	48.0	49.6	50.9	53.2	54.8	56.7	59.2	65.9
	40	43.4	46.6	49.3	51.7	53.9	55.5	57.4	58.9	61.4	63.4	65.6	68.3	76.1
	45	49.2	52.9	56.1	58.5	61.1	63.0	65.1	66.8	69.8	71.8	74.5	77.5	86.3
	50	55.1	59.1	62.7	65.6	68.3	70.4	72.8	74.8	78.0	80.4	83.2	86.8	96.7
	55	60.9	65.5	69.3	72.6	75.6	78.1	80.6	82.7	86.5	89.0	92.2	96.0	106.9
	60	66.8	71.7	76.0	79.5	82.8	85.5	88.2	90.6	94.5	97.5	101.0	105.0	117.3
9¼	15	16.2	17.4	18.4	19.2	20.0	20.7	21.4	21.9	23.0	23.8	24.6	25.7	28.7
	17½	19.5	20.9	22.2	23.2	24.1	25.0	26.0	26.5	27.7	28.7	29.8	30.9	34.7
	20	22.9	24.6	25.9	27.2	28.3	29.3	30.2	31.1	32.5	33.7	34.8	36.3	40.6
	22½	26.3	28.2	29.8	31.2	32.4	33.5	34.6	35.6	37.2	38.6	40.0	41.6	46.6
	25	29.6	31.8	33.6	35.2	36.6	37.8	39.0	40.2	42.0	43.5	45.1	46.9	52.5
	30	36.3	39.0	41.2	43.1	44.8	46.4	47.9	49.2	51.5	53.4	55.3	57.6	64.4
	35	43.1	46.2	48.8	51.1	53.1	55.0	56.7	58.4	61.0	63.3	65.5	68.3	76.4
	40	49.7	53.3	56.4	59.1	61.3	63.6	65.5	67.4	70.5	73.2	75.8	78.8	88.3
	45	56.5	60.6	64.1	67.0	69.7	72.0	74.3	76.5	80.0	83.1	86.0	89.5	100.1
	50	63.1	67.7	71.6	74.9	77.9	80.5	83.2	85.6	89.6	92.8	96.1	100.0	112.1
	55	69.8	75.0	79.3	82.9	86.2	89.2	92.0	94.7	99.2	102.8	106.4	110.6	123.9
	60	76.6	82.2	86.9	90.9	94.7	97.8	101.0	103.8	108.8	112.8	116.8	121.4	135.9
11⅛	15	18.4	19.8	20.8	21.8	22.6	23.3	24.0	24.6	25.6	26.5	27.6	28.8	32.0
	17½	22.2	23.8	25.1	26.3	27.3	28.1	28.9	29.7	31.0	32.0	33.3	34.7	38.6
	20	26.0	27.9	29.4	30.8	32.0	33.0	33.9	34.8	36.2	37.5	39.0	40.6	45.3
	22½	29.8	32.0	33.7	35.2	36.6	37.7	38.8	39.8	41.5	43.0	44.6	46.6	51.8
	25	33.6	36.0	38.0	39.7	41.3	42.7	43.9	45.0	46.9	48.5	50.3	52.6	58.5
	30	41.2	44.2	46.6	48.7	50.7	52.2	53.8	55.1	57.5	59.3	61.8	64.5	71.7
	35	48.7	52.5	55.2	57.7	60.0	61.9	63.6	65.3	68.0	70.3	73.1	76.3	84.9
	40	56.4	60.5	63.8	66.6	69.3	71.4	73.5	75.4	78.6	81.3	84.6	88.3	98.1
	45	63.9	68.7	72.5	75.7	78.7	81.1	83.5	85.5	89.2	92.3	96.1	100.1	111.1
	50	71.5	76.8	81.0	84.7	88.1	90.8	93.4	95.7	100.0	103.2	107.4	112.0	124.5
	55	79.1	85.0	89.6	93.7	97.4	100.2	103.3	105.9	110.5	114.2	118.8	123.9	138.4
	60	86.6	93.2	98.2	102.5	106.8	110.0	113.1	116.1	121.1	125.4	130.3	135.9	150.9

Recessed and Floor Cabinet Enclosures are available up to 44-in. height only; Wall Cabinet Enclosures up to 38¼" height only.
†Net length of heating unit only is L—½".
‡This depth not available in Concealed type. Heating Unit for Concealed type in this approximate depth is 3⅜" deep.

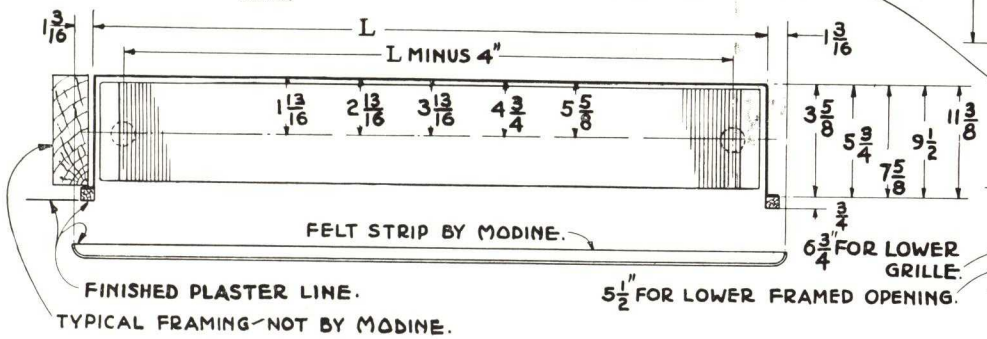
***Capacities of Modine HOT WATER Convector available on request.**

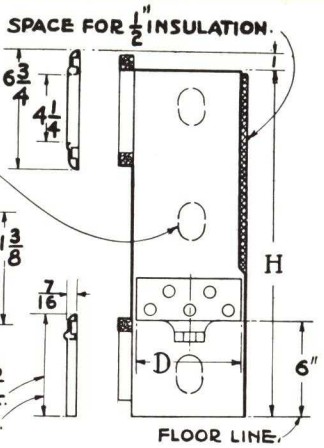
INSTALLATION DIMENSIONS

APPLY TO BOTH STEAM AND HOT WATER TYPE MODINE CONVECTORS

CONCEALED

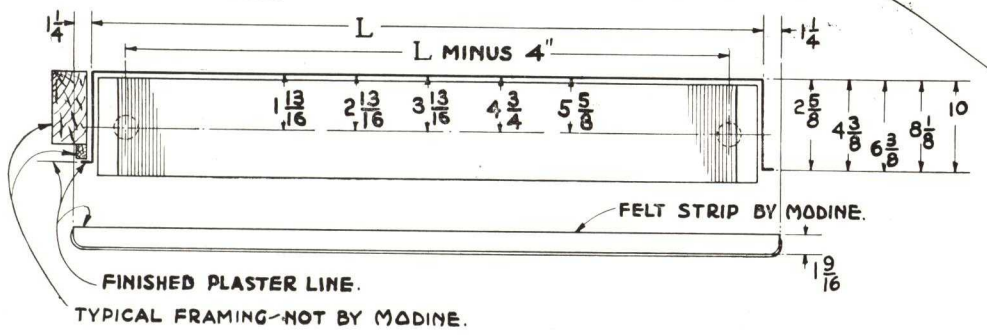
PLAN

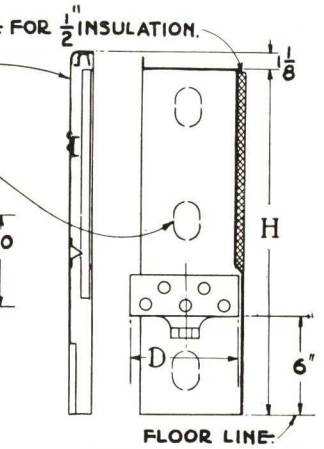




RECESSED

PLAN

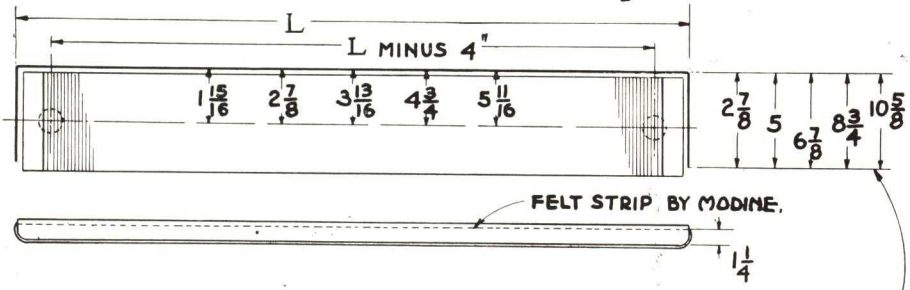


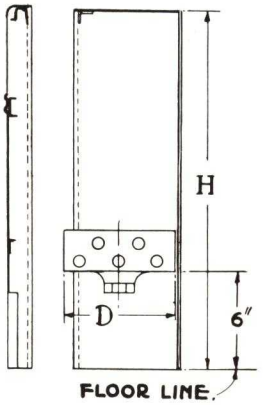


END ELEVATIONS

FLOOR CABINET

PLAN

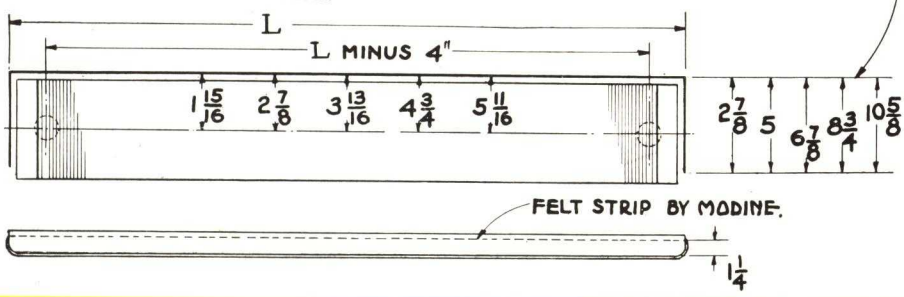


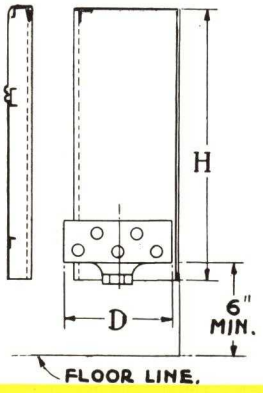


FOR OVERALL DEPTH OF CABINETS ADD 1 1/4" TO THESE DIMENSIONS.

WALL CABINET

PLAN

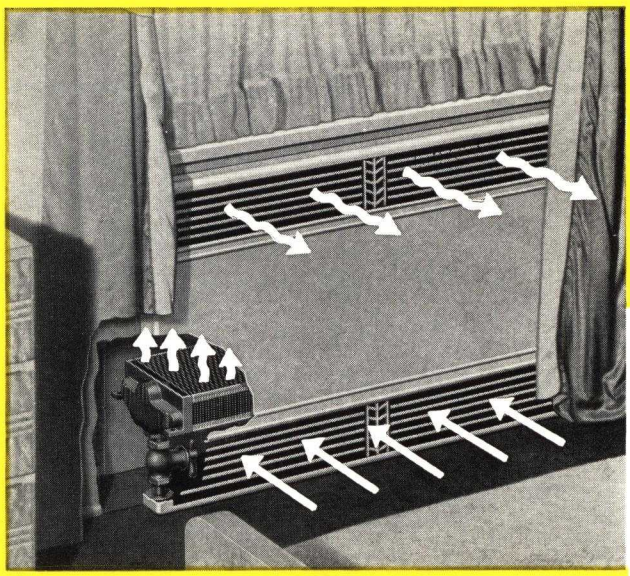




for **BETTER HEATING** and **AIR CONDITIONING**

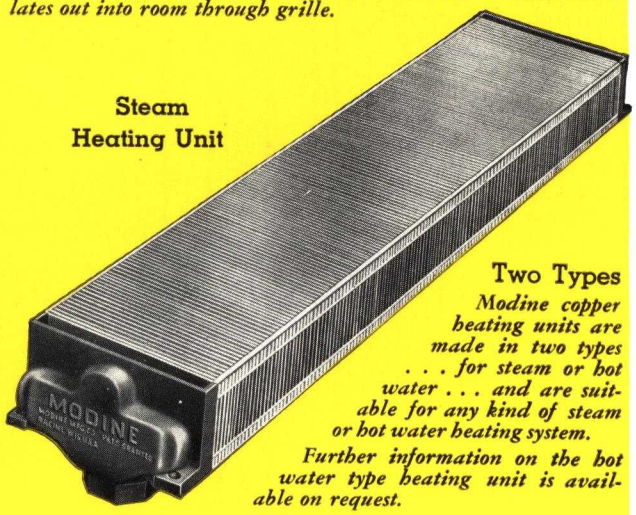
. . . . A SPLIT SYSTEM

using steam or hot water and MODINE CONVECTORS



The cooler, heavier air near the floor comes in contact with the copper heating unit . . . is heated, and rises . . . then circulates out into room through grille.

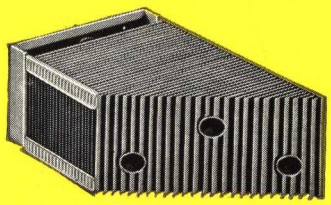
Steam Heating Unit



Two Types

Modine copper heating units are made in two types . . . for steam or hot water . . . and are suitable for any kind of steam or hot water heating system.

Further information on the hot water type heating unit is available on request.



Cross-Sectional View of Steam Heating Unit

TAPPING SIZE SCHEDULE

Type of System	3⅜ in.–3⅝ in. Depths			5½ in. Depth			7⅜ in. Depth			9¼ in. Depth			11⅛ in. Depth		
	Supp.	Ret.	Vent.	Supp.	Ret.	Vent.	Supp.	Ret.	Vent.	Supp.	Ret.	Vent.	Supp.	Ret.	Vent.
2 Pipe Steam and Vapor	¾ in.	½ in.		¾ in.	½ in.		1 in.	½ in.		1 in.	½ in.		1¼ in.	½ in.	
1 Pipe Steam	1¼ in.		¾ in.	1¼ in.		¾ in.	1½ in.		1 in.	1½ in.		1 in.	1½ in.		1¼ in.

● Today the architect-designed home is likely to be air conditioned. And, since the most important single function of air conditioning is heating—the superior flexibility of steam or hot water heating is essential to successful air conditioning. There is no better system of air conditioning and heating than a "split system"—heating part of the building by conditioned air and part by Modine Copper Convectors.

Extra Benefits of a "Split System"

"Split System" heating and air conditioning, using steam or hot water, gives these important advantages: (1) Permits such division between straight heating and air conditioning as best suits desire and pocketbook of owner; (2) Allows concentrating heat in bad exposure, as sunroom, with a convector or radiator supplementing conditioned air; (3) Allows use of convector in bathroom where forced air movement is objectionable; (4) Lets attached garage be heated without wasting conditioned air to out-of-doors; (5) Draws domestic hot water supply from single boiler, single burner; (6) Outwears any other system two to one; (7) Safer . . . more than just a single wall of metal restrains gases of combustion from entering the home.

Concealed Heaters Superior to Exposed Radiators

Convectors are the modern equivalent of radiators. Built into the wall, they occupy no floor space; may even be harmonized into the millwork of a room. Concealed Heaters impart a gentle air movement to room air. In "split system" heating they help distribute humidity from conditioned to non-conditioned rooms and help bridge periods of non-operation of the blower of the conditioner. Convectors respond more readily to automatic control.

Why Modine Convectors are Copper

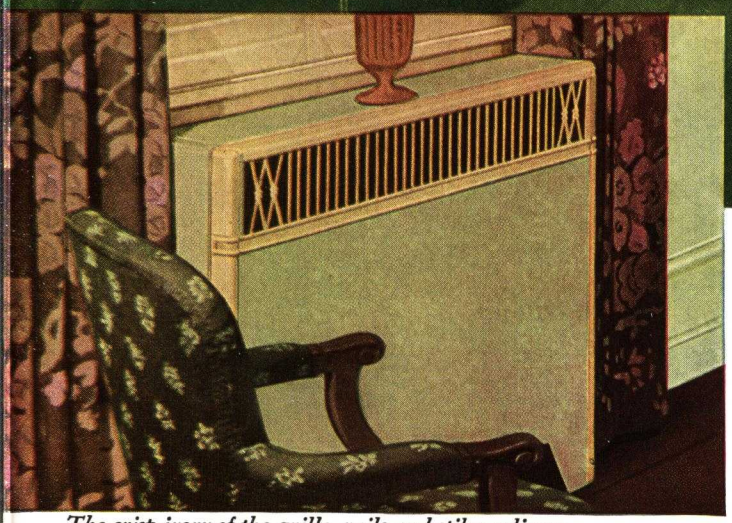
Modine Concealed Heaters are *copper* rather than cast iron. Copper is the natural metal for convector construction, inasmuch as convectors are extended surface heat transfer devices, wherein high heat conductivity for quick responsiveness, and smooth surfaces for avoidance of dirt collection are essential. *Copper convectors parallel the immediate responsiveness to today's marvelous thermostatic control devices, of an air conditioning system, closer than any other type of convector or radiator.*

Copper convectors do not radiate heat through rear of enclosures to be wasted to the out-of-doors nor radiate heat through the front of enclosures to shrink and crack plaster and wood surfacing and framing. Copper, perfectly suited to long, slender forming, is more leak-proof, more enduring than cast iron. *Nearly six times as much copper convector capacity is in service in the United States as that of any other type of convector.*

Beauty Keeps Pace with Mechanical Excellence

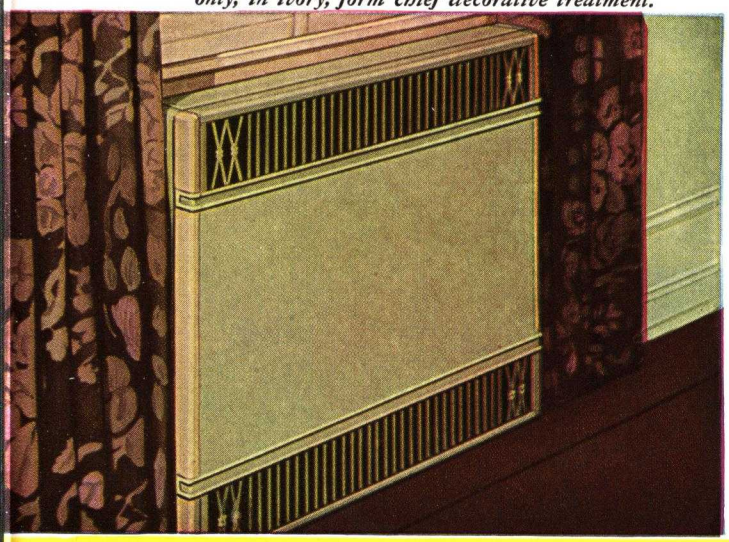
Conservatively rated and soundly built . . . Modine Copper Convectors are the product of the extensive facilities, experience and organization of a pioneer manufacturer with a financial rating of over a million dollars. For years the standard of mechanical excellence and reliable performance . . . Modines are setting a new record for outstanding beauty in finished appearance.

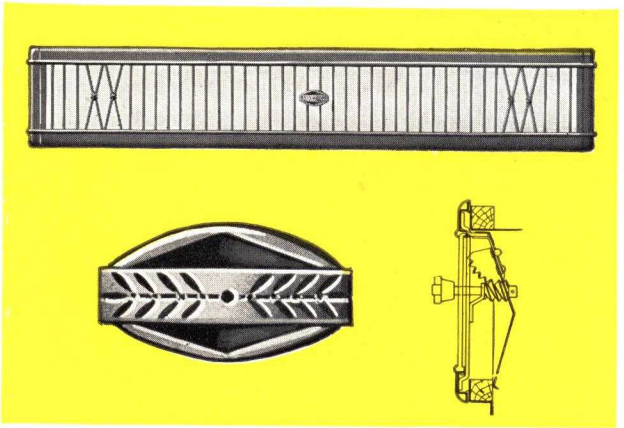
The graceful Regency Classic grille of this Floor Cabinet Convector is adequately in keeping with the taste and originality displayed in decorations and furnishings of room.



The crisp ivory of the grille, rails and stiles enlivens the cool, green finish of completely exposed cabinet.

Partially recessed cabinet, with two grilles. Stiles only, in ivory, form chief decorative treatment.



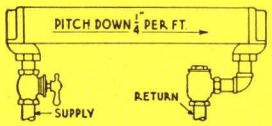


Temperature Control by Means of a Damper

Where it is not desired to employ individual control valves, the heat output from a Modine Convector may be controlled by means of a damper. The function of the Modine Damper is to regulate the amount of air passing through the heating unit, thus controlling the amount of heated air delivered. The Modine Damper is of the double-thread, worm and sector type and is controlled by the attractive, heat-resisting plastic knob illustrated above.

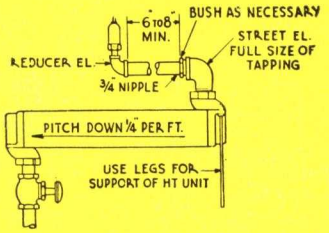
PIPING ARRANGEMENTS FOR MODINE CONVECTORS

Illustrated below are some of the varied piping arrangements that can be worked out with Modine steam convectors. The heating units can be furnished with two bottom tappings, one top and one bottom tapping at opposite ends, two end tappings, or one end tapping in combination with either a top or bottom tapping at the opposite end. A schedule of tapping sizes, including air vent tappings is given on page 10.

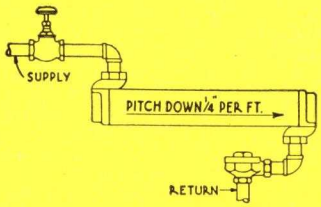


Two bottom tappings; two-pipe steam system.

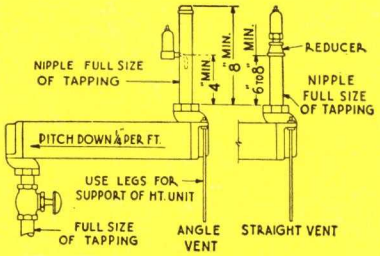
Two end tappings; two-pipe steam system.



†One-pipe steam system.



One top, one bottom tapping; two-pipe steam system.



*One-pipe steam system.

*This venting arrangement provides sufficient air chamber where convector is over 24 inches in height.

†This venting arrangement recommended to give large air chamber on one-pipe steam or hot water convectors 24 inches or less in height.

MODINE SALES OFFICES

Albany, N. Y.; Ernest E. Malpass, Industrial Bldg., 1039 Broadway, Albany 45610
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Atlanta, Ga.; J. W. Hinchey, 152 Nassau St., N. W. Walnut 0429
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This warranty does not cover any labor charges for replacement of parts, adjustments, repairs, or any other work done. We assume no responsibility for consequential damages of any kind, and the purchaser or user, by acceptance of this equipment, assumes the responsibility for the consequences of its use or misuse.

This warranty does not apply to any equipment which has been or may be repaired or altered in any way outside of our factory, so as, in our judgment, to affect its stability, nor to any equipment which has been subject to misuse, negligence, or operating conditions in excess of those stated in our catalog.

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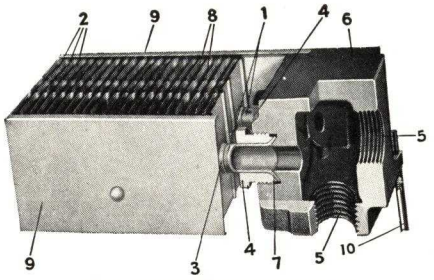

Cross Section Rocop Convector

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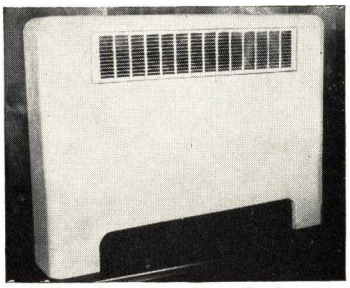
Also known as ROCOP Convectors and Enclosures. ROCOP is the modern concealed non-rusting copper radiation. Thousands of ROCOP Convectors have been installed during the past eight years. They have been approved and used by the U. S. Government. The unusual service and satisfaction given by these convectors are good reasons why architects and engineers continue to specify them. Send for complete Engineering Data. Specify ROCOP Radiation for schools, hospitals, apartments and homes, or wherever cast iron radiation has been used.



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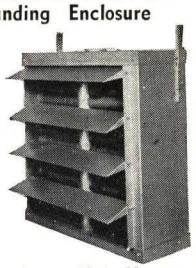
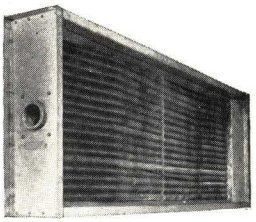


Rome Unit Heaters

ROME BLAST AIR HEATERS

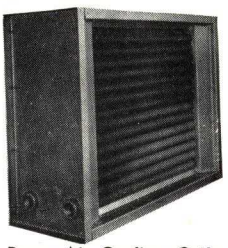
Designed and built to provide a complete range of capacities. Reliable test data covering various air velocities entering air temperatures and steam pressures is available upon request. Rome construction eliminates expansion and contraction strains. Rome seamless cold drawn Copper Helical Fin tubing used in these heaters provides a permanent bonded metal contact between fin and tube insuring constant efficiency over a long period of years. Ask for Engineering Data.



Rome Blast Air Heaters

ROME AIR COOLING COILS

Well water type and direct expansion type—these coils have incorporated in their construction all of the essential features so necessary for long life and constant satisfactory performance. Engineering data prepared from tests made by one of the leading authorities on heat transfer is now available. This data is arranged in easily understood form and should be on the desk of all specifying engineers.



Rome Air Cooling Coils

ROME HELICAL FINNED TUBING

The pioneer type of finned tubing with metallically bonded fin provides high efficiency with low air resistance. It is used by nearly all large builders of heating, cooling and condensing equipment. Over 90 sizes in production. Used for many types of heat transfer other than those listed on this page. Ask for Bulletin 102.

Finned Tube

GRINNELL COMPANY, INC.

EXECUTIVE OFFICES

PROVIDENCE, R. I.

OFFICES IN PRINCIPAL CITIES

For Automatic Sprinkler Systems, Unit Heaters, Welding Fittings and Heating Specialties, see File Index

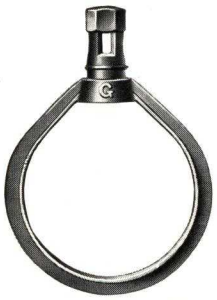
GRINNELL ADJUSTABLE PIPE HANGERS AND SUPPORTS

The large line of Grinnell Adjustable Pipe Hangers and Supports is the outgrowth of over half-a-century of experience in the industrial piping field. Its completeness assures no delay in obtaining special hangers for there is a type to meet practically every condition encountered in piping work.

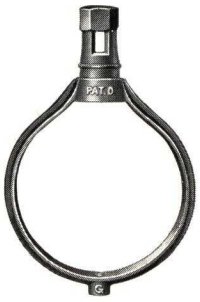
Being *adjustable after erection,* Grinnell Hangers are easy to install and a few turns quickly lines up a piping equipment either during or years after installation. Increased safety and efficiency with decreased maintenance expense result from their use.

A few of these labor saving Hangers and Supports are shown below and on following page.

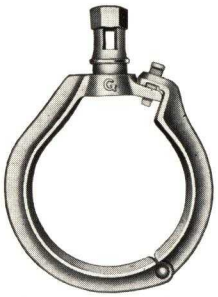
For a complete Catalogue, address GRINNELL COMPANY, INC., 277 West Exchange Street, Providence, R. I.



Adjustable Swivel Ring
Fig. 101

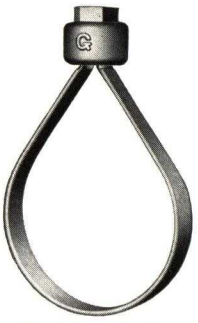


Adjustable Swivel Ring with Boss—Fig. 101-B



Adjustable Swivel Ring Split Ring Type—Fig. 104

Adjustable Wrought Ring Hanger—Fig. 95



Adjustable Wrought Pipe Ring
Fig. 97

Split Pipe Ring With Socket Pipe Thread—Fig. 107
Rod Thread—Fig. 107-R

Adjustable Wrought Clevis Hanger—Fig. 260

Adjustable Wrought U Pipe Hanger—Fig. 252

Adjustable Swinging Hanger Flange, Complete
Fig. 155

Adjustable Clip
Fig. 106

CB-Universal Insert
Fig. 282

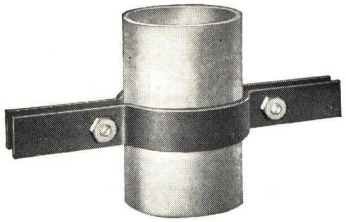
Simplex Concrete Insert
Fig. 281

Pipe Hanger Flange
Fig. 153

Swivel Hanger Flange
Fig. 154

Side Beam Bracket
Fig. 202

Side Column Bracket
Fig. 203

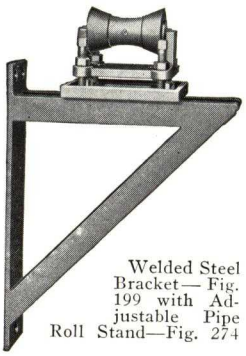


Extension Pipe Clamp or Riser Clamp
Fig. 261

U Hook
Fig. 205

Adjustable Coach Screw Clip (Sprinkler Line)—Fig. 100

GRINNELL ADJUSTABLE PIPE HANGERS AND SUPPORTS—Continued

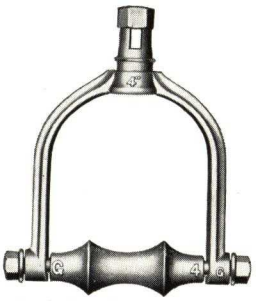


Welded Steel Bracket—Fig. 199 with Adjustable Pipe Roll Stand—Fig. 274

Pipe Seat
Fig. 198

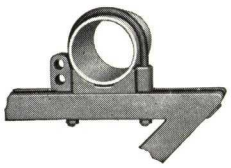
Single Pipe Roll (Complete)—Fig. 171
Pipe Roll Only—Fig. 173

Two-Pipe Adjustable Brackets
Small Pipe at Top — Large Pipe at Top
Fig. 175 — Fig. 176



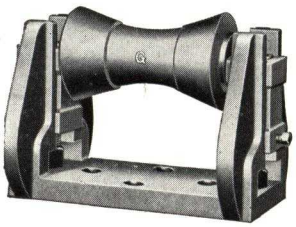
Adjustable Swivel Pipe Roll
Fig. 174

Pipe Roll Stand (Complete)—Fig. 271
Pipe Roll and Rod—Fig. 272
Pipe Roll Only—Fig. 273

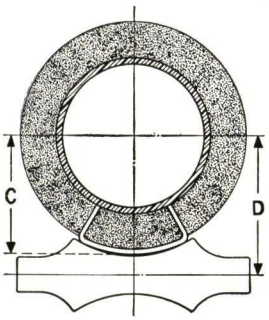


Anchor Chair
Fig. 197

Type A Pipe Covering Protection Saddle showing small points of contact which cut heat losses to a minimum.



Adjustable Pipe Roll Stand
Fig. 276



Type A
For 10-in. Pipe and Smaller

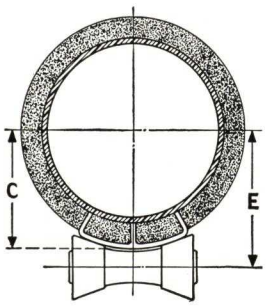
Fig. 187 Saddle on
Fig. 173 Pipe Roll

Pipe Covering Protection Saddles

For Standard Thick Covering
Fig. 186

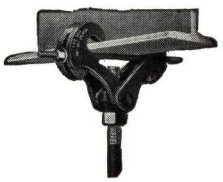
For Double Standard Thick Covering
Fig. 187

For Double 1½ in. Thick Covering
Fig. 188



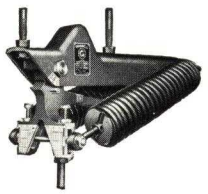
Type B
For 12-in. Pipe and Larger

Fig. 186 Saddle on
Fig. 273 Pipe Roll

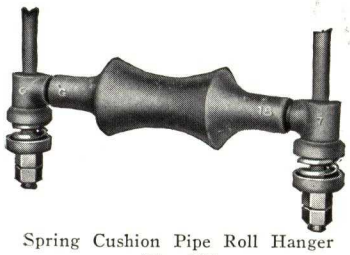


U.F.S. I-Beam Clamp
Fig. 228

Pipe Roll and Plate—Fig. 277

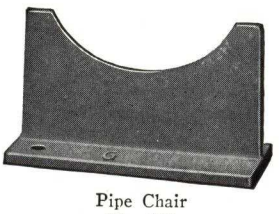


Genspring Constant-Support Hanger
Fig. 286



Spring Cushion Pipe Roll Hanger
Fig. 256

Pipe Saddle Support
Fig. 258



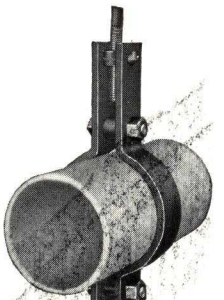
Pipe Chair
Fig. 183

Spring Cushion Pipe Hanger
Fig. 255

Wrought Pipe Clamp
Fig. 212

Adjustable Pipe Saddle Support
Fig. 264

Pipe Stanchion Saddle
Fig. 259



Adjustable Wrought Pipe Clamp
Fig. 251

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WATERBURY, CONNECTICUT

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OFFICES AND AGENCIES IN PRINCIPAL CITIES

For Other Pages, see File Index

ANACONDA COPPER TUBES AND FITTINGS FOR HEATING LINES

Since the introduction of relatively lightweight copper tubes connected with solder-type fittings, plumbing and heating contractors have been quick to take advantage of this type of piping for both plumbing and heating lines. They have found that a complete non-rust installation costs but little more than one of less durable pipe and fittings. This low cost is due to the fact that solder-type joints make it unnecessary to cut away part of the tube wall for threads. Consequently, the tube walls can be made thinner with less weight per foot, and a corresponding reduction in cost.

ANACONDA
from mine to consumer
REG. U.S. PAT. OFF.

Mechanically, a piping system made up of copper tube and solder-type fittings provides more than ample strength where conditions of pressure and temperature are normal.

Old Methods of Pipe Sizing

Before copper tubes came into prominence in the domestic heating field, it was customary to use iron or steel in pipe sizes considerably larger than the copper tube sizes used today. This was particularly true of gravity type hot water systems because of the inherent low circulation head and velocity. Modern forced circulation systems employ permanently smooth wall copper tubes of small diameter and long radius elbows which retain their superior carrying capacity indefinitely.

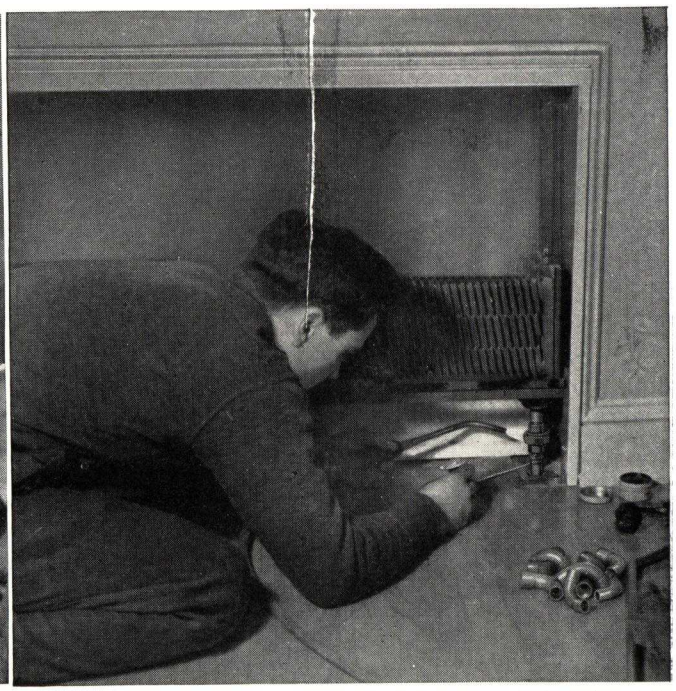
Copper Lines Free from Rust

The absence of rust and scale formation in a copper tube system has the further advantage of eliminating the possibility of rust or corrosive sediment localizing in the fittings, valves or traps, and thereby reducing the effectiveness of the system.

Attractive Appearance

The neat appearance of a polished and lacquered copper tube installation, together with the small size of the tubes used, have a decided appeal, as is evidenced by the many hundreds of hot water copper tube systems installed in suburban homes where the basement is usually converted into a recreation room.

Annealed copper tubes can be bent by hand to eliminate several fittings, or to permit offsets around ordinary obstructions



Copper tubes can be assembled with solder fittings in tight corners. The flexibility of these tubes make it easy to compensate for minor inaccuracies

Copper Tube Installation Inexpensive

It is the consensus of opinion among heating contractors who have had considerable experience with copper tubes and solder fittings, that these materials afford installation economies not possible with thread type connections.

The entire cost of the copper tube installation, including both materials and labor, ordinarily is but slightly more than an iron pipe job of equal radiation capacity. The advantages made possible through the use of copper tubes, plus their many years of trouble-free service, effectually offset any slight additional first cost.

Application

Hard drawn tubes are most frequently used for mains and risers, and often for branch runs, to radiators. In exposed installations, hard drawn tubes present a more attractive appearance. Offset bends can be made in hard drawn copper tubes by annealing locally with a torch to a dull red heat before the bend is made. *No bends should be attempted with hard tubes without first annealing, and sharp bends should be avoided.*

In replacing old installations and in remodeling, the smaller size soft tubes in 60-ft. coils can be run through the walls and partitions with a minimum of damage to the structure. Soft tubes can also be used to advantage for the branch runs between the mains or risers and the radiators. These soft tubes can be bent by hand to eliminate many fittings; to permit offsets around ordinary obstructions; or to compensate for slight inaccuracies encountered in practice. Soft tubes, joined with flared tube fittings, are also used for connecting oil burners with fuel tanks.

Gauges and Types

ANACONDA Copper Tubes in all standard sizes are carried in stock by distributors located in the principal trading sections of the country.

They are furnished in three different wall thicknesses which are identified as Types K, L and M. They meet the requirements of U. S. Government Specifications WW-T-799, and A.S.T.M. Specifications B-88-33, (Specifications for Type M cover hard drawn tubes only.)

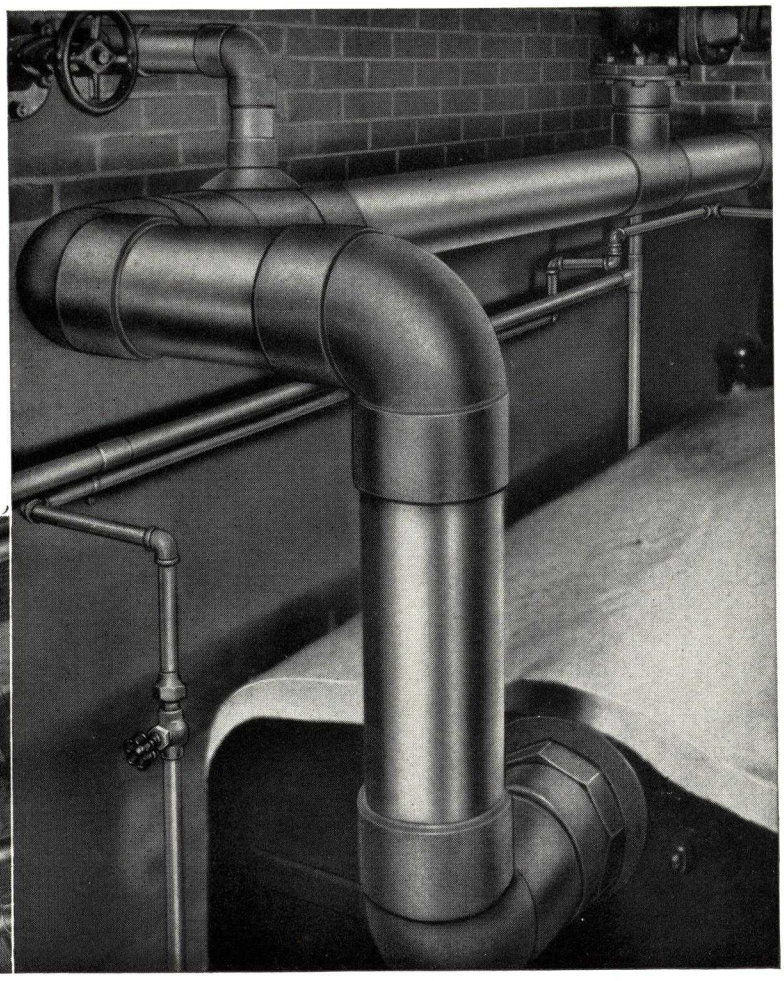
Detailed information will be furnished upon request.

Fittings

Anaconda Solder Fittings are available in both wrought copper and cast bronze. They are made to the exacting dimensions so essential for sound, leak-proof joints. Smooth inside surfaces permit quick, thorough cleaning which is necessary for satisfactory soldered connections. Deep cups, with high shoulders for the tubes to butt against, provide a maximum area for the solder bond.

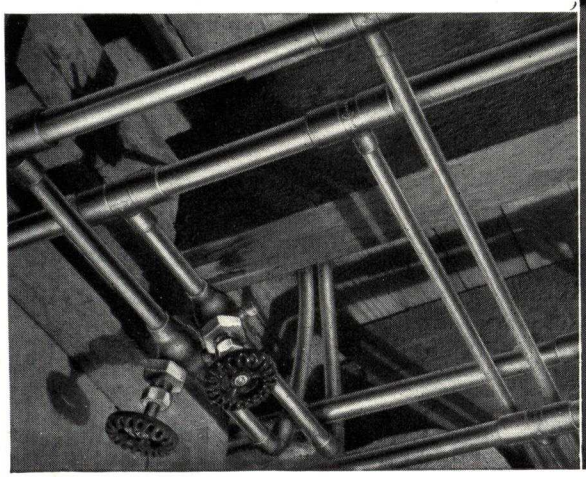
All Anaconda Solder Fittings are tested to 90 lbs. air pressure under water, which is the equivalent of 400 to 450 lbs. water pressure. They are so designed as to offer a minimum of resistance to the flow of water.

For information regarding fittings for use with these tubes, see File Index for our page on Pipe, Tubes and Fittings for Plumbing.



(Right) Large size Anaconda Copper Tubes are used for heating lines in office buildings, apartment houses, etc.

(Below) The compactness and attractive appearance of a copper tube installation is a decided advantage



GRINNELL COMPANY, INC.

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GRINNELL WELDING FITTINGS

Grinnell Welding Elbows, Returns and Tees are made from Seamless Steel Pipe or Tubing and are equivalent to the pipe itself—their Working Pressure-Temperature Ratings are equal to that of Seamless Steel Pipe.

Once the pipe for any condition has been determined it only remains to select Grinnell Welding Fittings to match. A simple rule to follow is this: "The Grinnell Welding Fittings should conform in minimum wall thickness, outside diameter at welding ends, inside diameter and tolerances to the dimensions of the adjoining pipe." This applies whether seamless pipe or butt or lap-welded pipe is to be used in the straight runs.

All Grinnell Welding Fittings have welding faces for all plain circumferential Butt Welds scarfed or beveled to the regulation 45° angle with $\frac{1}{16}$-inch square end on inside of fitting. Angles of bevel other than 45° can be furnished on special orders.

The Grinnell Welding Fittings Catalog containing complete descriptive and engineering data on these quality products will gladly be sent upon request to GRINNELL COMPANY, INC., 277 West Exchange Street, Providence, R. I.

Welding Elbows and Returns

(Manufacturing Process Patented)

90° Elbows

45° Elbows

180° Returns

Grinnell Welding Elbows and Returns are furnished in Long Turn (1½ times nominal pipe size) and in Short Turn (approximately 1 times nominal pipe size) and in two weights. They have these distinctive features:

Made from seamless steel tubing.

One-piece fitting—no seams.

Uniform wall thickness at all points.

Smooth surfaces inside and outside—no flattening or buckling.

They are uniform and circular at all diametric angles.

Can be cut to any arc at diametric angles and will match up with pipe.

No need for tangents to make them circular.

Match up to standard weight, extra strong and o.d. pipe.

Working pressure and temperature ratings are same as for seamless pipe.

Welding Tees

(Patents Applied For)

Welding Tees

Grinnell Welding Tees are one-piece fittings made from seamless pipe or tubing; being of the same physical characteristics as standard, extra strong and o.d. steel pipe or seamless steel pipe of comparable pipe size, can be used under same conditions, pressures, and temperatures as the pipe itself.

Welding Outlets

(Patented)

Welding Outlets

Threaded Outlets

Grinnell Welding Outlets and Threaded Outlets are stock fittings properly designed for pipe welding and provide a simple and economical method of making welded branch connections.

Welding Outlets are for use in welded pipe installations and are suitable for practically all pressures and services.

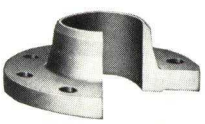
Threaded Outlets are used principally for low pressure heating systems, for radiator outlets, branch lines, etc., but may be used for other services and pressures.

Concentric Welding Reducers

Concentric Welding Reducer

Concentric and Eccentric Reducers are made from seamless steel pipe and are furnished in either standard or extra heavy weights.

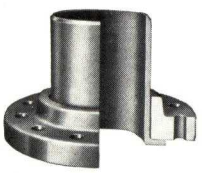
Welding Neck Flanges



Welding Neck Flange

Welding Neck Flanges are of Forged Steel. They can be furnished for 150, 300, 400, 600, 900 and 1500 lbs.

Lap Flanged Welding Necks



Lap Flanged Welding Necks

Grinnell Lap Flanged Welding Necks are regularly furnished for working steam pressures of 150, 300, 400 and 600 pounds. Furnished on order for higher pressures.

Each consists of forged steel flange and short piece of steel pipe or tubing with 100 per cent square lap. Opposite end scarfed for welding.

GRINNELL COMPANY, INC.

EXECUTIVE OFFICES
PROVIDENCE, R. I.
OFFICES IN PRINCIPAL CITIES

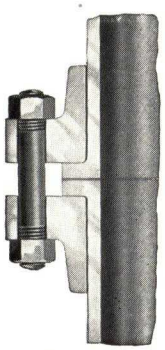
For Automatic Sprinkler Systems, Unit Heaters, Welding Fittings, Heating Specialties and Pipe Hangers, see File Index.

GRINNELL PREFABRICATED PIPING MATERIAL

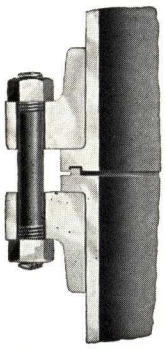
Whether your needs require the selection of a single piece of prefabricated piping material or the interpretation of a complete power piping specification, GRINNELL COMPANY, INC., places at your disposal, a service combining qualities of material and workmanship which shop and field experience have demonstrated to be conservative and dependable. This service includes the furnishing of all types of Welds, Pipe Bends, Lap Joints, etc., to cover every requirement.

At each of our sales offices will be found an Engineering Staff ready to aid in the solution of your piping problems.

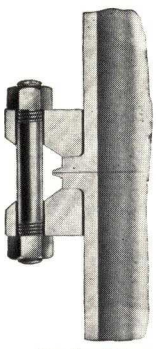
Address GRINNELL COMPANY, INC., 277 West Exchange Street, Providence, R. I.



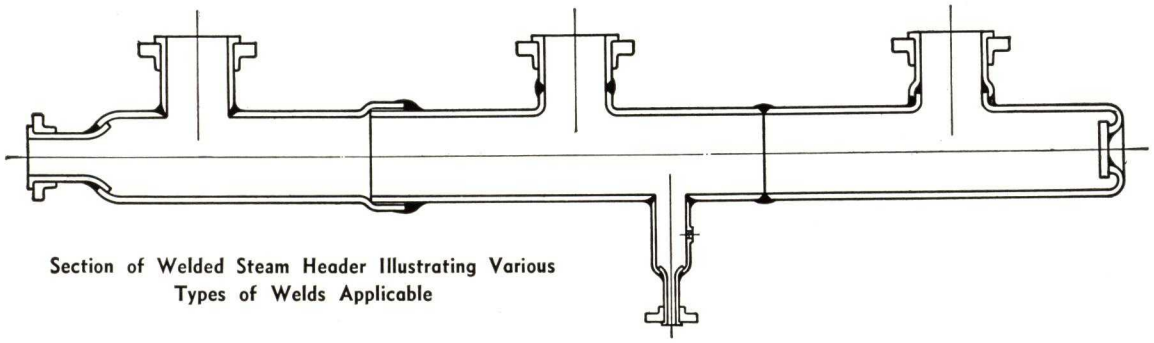
Square Lap



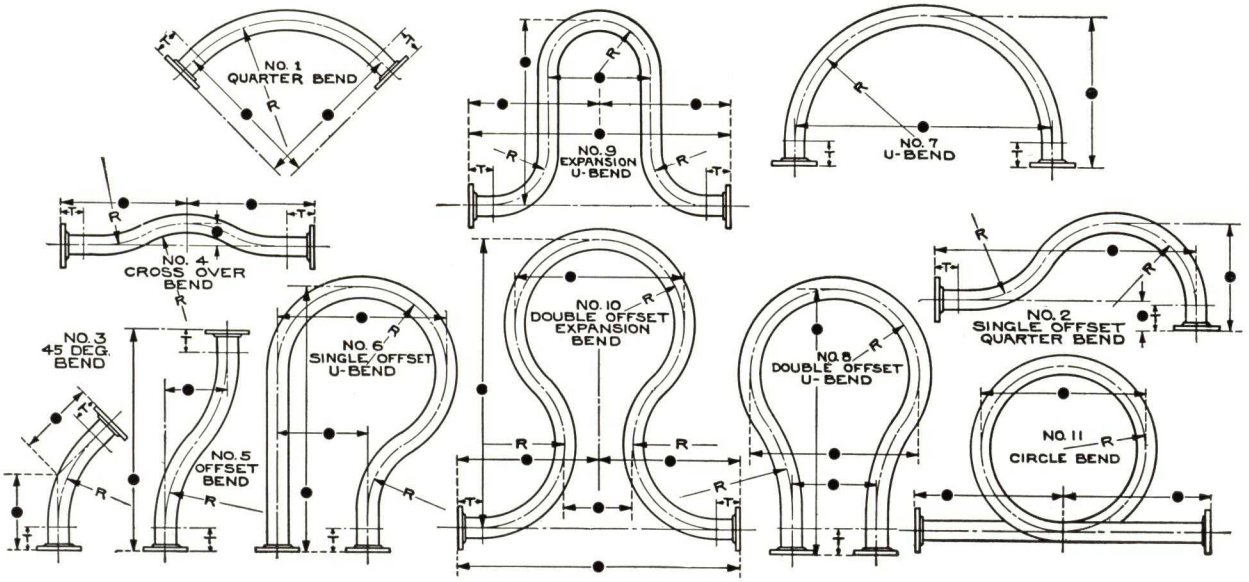
Small Tongue and Groove Lap



"Sarlun" Lap



Section of Welded Steam Header Illustrating Various Types of Welds Applicable



Typical Grinnell Pipe Bends

THE LINDE AIR PRODUCTS COMPANY

UNIT OF UNION CARBIDE AND CARBON CORPORATION

GENERAL OFFICES
30 East 42nd Street, NEW YORK, N. Y.

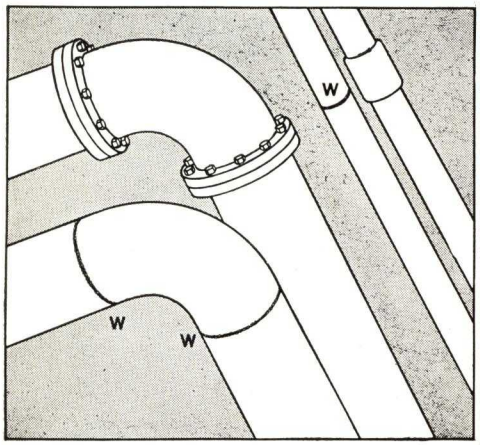
WHERE TO BUY

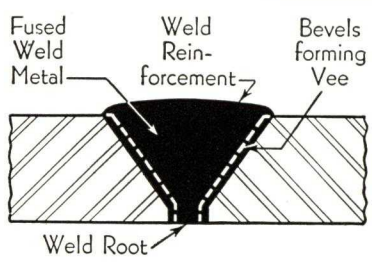
Linde offices are maintained in the following cities. Local addresses are obtainable from telephone directories

ATLANTA, GA. BALTIMORE, MD. BIRMINGHAM, ALA. BOSTON, MASS. BUFFALO, N. Y. BUTTE, MONT. CHARLESTON, W. VA. CHICAGO, ILL. CLEVELAND, OHIO DALLAS, TEX. DENVER, COLO. DETROIT, MICH. EL PASO, TEX. HOUSTON, TEX. INDIANAPOLIS, IND. KANSAS CITY, MO. LOS ANGELES, CALIF. MEMPHIS, TENN. MILWAUKEE, WIS. MINNEAPOLIS, MINN. NEW ORLEANS, LA. NEW YORK, N. Y. OAKLAND, CALIF. PHILADELPHIA, PA. PHOENIX, ARIZ. PITTSBURGH, PA. PORTLAND, ORE. ST. LOUIS, MO. SALT LAKE CITY, UTAH SAN FRANCISCO, CALIF. SEATTLE, WASH. SPOKANE, WASH. TULSA, OKLA.

PIPING DESIGN FOR INSTALLATION BY OXY-ACETYLENE WELDING

With the development of improved methods, oxy-acetylene welding has become one of the most satisfactory methods of joining pipe. Information on various kinds of oxy-acetylene welding, specification data and a discussion of recommended practices and uses are presented here. Since factors affecting the choice of welding methods, layouts and techniques may vary with each job, specific information should be obtained from the book, "Design of Welded Piping," which will be sent to you by any office of THE LINDE AIR PRODUCTS COMPANY on request.





BUTT WELD

Open-Vee Type, for use when pipe walls are thicker than 3/16"

Methods and Definitions

Welding is a method of uniting metals by means of heat. Three essential requirements are: (1) a source of controlled heat for rapid, localized melting of metal; (2) complete elimination of metallic oxides; (3) establishment of metal-to-metal union by molten metal.

Oxy-acetylene welding employs a flame caused by combustion of oxygen and acteylene as the heat source. Basic types of oxy-acetylene welding are Fusion Welding and Bronze-welding. In *Fusion Welding* (the type more generally used), pipe metal is melted, metal is added from a rod of appropriate composition, and oxides are removed by melting action or by a separate flux. With certain materials, however, a self-fluxing rod can be used. In *Bronze-welding* (see Table I), pipe metal is not melted, molten metal is added from a bronze rod, and oxides are always removed by a flux.

Both Fusion and Bronze-welding are usually done with a single flame, and the weld is normally built up to full size in a single layer. *Lindewelding* is sometimes done with multiple flames where the pipe can be turned horizontally. When the wall thickness is over ½ inch, the weld is generally built up in multiple layers. Layer welds do not need to be continuous, but may be "stepped."

Table I - OXY-ACETYLENE WELDING METHODS

METHOD	USE	
	Thickness of Pipe Wall	Material
Lindewelding (Single-Layer)	Up to ½"	Steel and iron
Lindewelding (Multi-Layer)	9/16" and up	Steel and iron
Neutral-Flame Welding (Single-Layer)	Up to ½"	Steel, iron, stainless steel, aluminum and lead
Neutral-Flame Welding	9/16" and up	Steel, iron, stainless steel, aluminum and lead
Bronze-Welding (Single-Layer)	All customary thicknesses	Cast iron, galvanized iron, copper and brass

STRENGTH OF WELDED JOINTS:

Neutral-Flame Welding: 47,000 to 58,000 lb. per sq. in. depending on composition of welding rod.

Bronze-Welding: 50,000 to 55,000 lb. per sq. in., average, using Oxweld No. 25 M. Bronze Rod.

Lindewelding: 60,000 to 100,000 lb. per sq. in. and greater, matching strength of pipe.

Lindewelding, an improved method of fusion welding, employs a flame carrying slightly more acetylene than is necessary for complete (or "neutral") primary combustion and a special rod and technique. Carbon present in the flame reduces surface oxides to metallic iron and lowers the melting point of exposed steel surfaces. Deep melting is unnecessary. Other advantages are outlined below.

Welding Techniques are of two types: *Forehand,* in which the flame follows the welding rod, but is directed ahead of the point of weld, thoroughly preheating the base metal and in effect "pushing" the molten metal; and *Backhand,* in which the flame precedes the rod in the direction of welding, preheating the pipe metal only enough to melt the surface and "pulling" the molten metal after it.

Backhand technique is used in *Lindewelding,* in which the combination of technique, composition of the special rod and flame and the resulting slight depth of fusion produce joints consisting almost entirely of welding rod metal. Uniformity, strength and quality of such joints are easily controlled.

Types of welded pipe joints are shown in Table II, which also contains symbols for their indication on drawings. For types of fittings see "Fabrication and Erection" below.

Factors influencing success when installing pipe by welding are: (1) piping layouts; (2) joint and fitting designs; (3) selection of materials for welding quality; (4) qualification of welding operators; (5) preparation of joints; (6) welding technique; (7) tests of completed work. For details see the book, "Design of Welded Piping."

Recommended Uses

Welding of all sizes and types of pipe is practical, as well as welding expansion bends, pipe racks, anchors and hangers and various types of pipe structures.

Installation by melding is especially recommended for: (1) all jobs where safety is the governing factor, as in oil, gas or refrigeration piping; (2) large installations where maintenance charges would otherwise be prohibitive; (3) process and underground piping, including steam service, where prolonged shutdowns and expense of repairing mechanical joints are to be avoided.

When installations may require cleaning or periodic replacement, as in systems conveying flammable gases or liquids, conveniently located mechanical joints should be included in layouts.

Table II - TYPES and INDICATION of JOINTS and FITTINGS for WELDED PIPING

BUTT WELDS			INSIDE CORNER			WELDS		OUTSIDE CORNER
Two-Line	Single-Line	Joint or Fitting	Two-Line	Single-Line	Joint or Fitting	Two-Line	Single-Line	Joint or Fitting
		Welded Line Joint — Field Tie-In Weld			Down-Turn in Line			Eccentric Welding Reducer
		Welded Line Joint — Shop or Field			Up-Turn in Line			Concentric Welded Reducer
		Nipple			Semi-Welded Offset			Eccentric Welded Reducer
		Welding Neck Flange			Offset in Line			Swaged Reducer
		Lap Flange with Lap Welding Nipple			Welded Tee			Orange Peel Head
		Welded Slip-On Flange			Welding Tee			Blunt Head
		Fabricated Flange			Welding Elbow Sweep Tee			Square Head
		90° Welding Elbow			Pipe Bend Sweep Tee			Formed Head
		45° Welding Elbow			Welded Turn Sweep Tee			Welding Head
		180° Welding Elbow			Welded Lateral			Welding End Valve
		Standard Pipe Bend			Welded Y			Welding End Angle Valve
2½ D	2½ D	4-Piece 90° Welded Turn			Welding Outlet			Anchor
2½ D	2½ D	4-Piece 90° Semi-Welded Turn			Concentric Welding Reducer			

Piping Layouts

Great freedom of design is possible in using welding for the installation of pipe, yet conventional methods of making layouts need not be changed. Greater variation in angles, sweeps and pitches is permissible than with mechanical pipe joints since flanges and fittings of fixed angles and dimensions may be almost eliminated; expansion bends, anchors or pipe frames may be welded in or to the line.

Fabrication and Erection

Piping may be installed by welding in two ways: (1) All piping on a job may be *shop fabricated* to exact dimensions with assurance that sections will fit; this is convenient if many welded fittings (see "Types of Fittings") are required. Fabrication may be done in a *field shop,* a *contractor's shop* or in shops of companies specializing in such work. If layouts are complicated, involving closely nested lines and numbers of headers, turns or branches, piping will be fabricated most easily in sections at the shop, and the sections can then be welded into place on the job. (2) Pipe and fittings can be welded together in the field if stock welding fittings are used. *Job fabrication* is suitable for most installations. Choice of fabrication depends also upon size of job and clearances available.

Types and Fittings Include—*Welded fittings,* which are fabricated on the job or in the shop; and *Welding fittings,* which are prefabricated and welded to pipes usually with butt joint (see Table II).

Line joints — The simplest and easiest method of welding two or more lengths of pipe in a straight line is to make *rotation welds* (butt joints), in which pipes are held horizontally and rotated, while the operator works from above. This method should be considered wherever possible in making pipe layouts.

Clearances—Most erection welds will probably be made in position, and must be accessible. This means only that the operator must be able to see every part of the weld and must have sufficient room for arms and shoulders.

When recommended clearances cannot be provided, methods of obtaining clearance should be left to the discretion of the erection crew. Alternative methods include: lifting, dropping or springing the line and making final tie-in welds at accessible points; and in extreme cases, cutting out exposed sections, welding concealed faces and rewelding cut sections.

Specifications

The following outline specifications may be enlarged or amended as desired. Consult "Design of Welded Piping" published by THE LINDE AIR PRODUCTS COMPANY.

Joints and Fittings. All piping 1, 1½, 2, 2½ inches in diameter and larger shall be installed with welded joints, using the oxy-acetylene welding processes. Fittings manufactured specially for welding shall in general be used throughout the piping system.

Welding fittings shall correspond to pipe to which they are to be welded, in quality, material, and matching and bevel of ends. They shall have minimum wall thicknesses not less than that of the pipe, and shall have a factor of safety equal to or greater than that of the pipe. Welded branch connections may be made instead of using welding tees or welding outlets where branches are of smaller diameter than mains.

Welding: Welds for line joints and other joints where possible shall be open-butt type. Pipe ends shall be beveled where the pipe wall thickness of 3/16 inch or more.

All welding shall conform to practices recommended in the latest edition of "Fabrication of Welded Piping" published by THE LINDE AIR PRODUCTS COMPANY, New Work. Welding operators must be properly qualified and may be required to make up one or more typical test joints.

Welding rod for steel and wrought iron pipe shall be Oxweld* No. 1 High Test Rod, Oxweld No. 24 Lindeweld* Process Rod or approved equivalents. For galvanized iron, cast iron, brass and copper pipe, Oxweld No. 25 M. Bronze Rod and Brazo* Flux or their approved equivalents shall be used.

Acceptance Tests. All welded piping shall be subjected to a suitable tightness test with air, steam or other medium, under which test all welds shall show no leaks or other defects.

Linde Products and Service

Everything required for the oxy-acetylene welding of pipe can be obtained from THE LINDE AIR PRODUCTS COMPANY—Linde* Oxygen, Prest-O-Lite* Dissolved Acetylene, Union* Carbide, and Oxweld welding and cutting apparatus and supplies.

For additional information on materials, specifications and methods, and addresses of local distribution faculties, consult the nearest Linde office.

*Trade-Mark.

BENJAMIN RIESNER

Manufacturer of the Riesner Ventilating Brick

TELEPHONE
BUtterfield 8-8580

353 East 78th Street, NEW YORK, N. Y.

ARCHITECTURAL EXHIBITS IN PRINCIPAL CITIES

For Riesner Louvered Wall Ventilating Brick, see File Index

FOR VENTING FUEL OIL AND VOLATILE OIL STORAGE TANKS

Description

A hollow cast metal brick, size of one standard brick with louvered face, finished with waterdrip at top and bottom with inside standard threading at back to connect to 1, 1½ or 2-in. diameter vent pipes.

Where Used

For venting Fuel Oil Storage Tanks and Volatile Inflammable Oil Storage Tanks outside of buildings.

Installation

The Ventilating Bricks are built in by the mason, as he bricks up the wall with the louvered face to the outer air and the threaded connection to the inside, ready for pipe connection.

Mason should provide chase in wall for vertical vent line.

Riesner Ventilating Bricks for ventilating fuel oil tanks should be placed according to local ordinance requirements generally "not less than 2 ft. from any building opening not less than 4 ft. or more than 12 ft. above the fuel pipe terminal.

Riesner Ventilating Bricks for ventilating volatile oil storage tanks *outside of buildings* should be placed according to local ordinance requirements generally at least 10 ft. from the nearest window of any adjoining building.

The Riesner Ventilating Bricks have been approved by the Board of Standards and Appeals for use in New York City, UNDER CAL. No. 15-36 S. A.

Construction Types and Sizes

Type "F" 2 In.—2¼ in. high, 8 in. wide, 4 in. deep with 2-in. diameter pipe connection at the back.

Type "F" 1½ In.—Same as "F" 2 in. with a double tapped G. I. bushing reducing the 2-in. thread to fit 1½-in. vent pipe.

Type "G" 1 In.—2¼ in. high, 8 in. wide, 4 in. deep with two 1-in. diameter pipe connections at back with a cast iron wall between openings, providing two separate vent openings and connections from one casting.

Screens—All types are furnished with removable screens of two thicknesses of 20-mesh brass wire gauze placed immediately in front of louvered casting and held in place with two brass screws.

Advantages

The Riesner Ventilating Brick Types "F" and "G" are made of cast iron galvanized, also of cast bronze.

The Riesner Ventilating Brick does not take up any space—it is bricked into the wall.

Ventiating Bricks can be built into brick walls, concrete forms, frame construction and pre-fabricated wall finishes.

They constantly ventilate, are always in view, have removable screens and present a pleasing appearance.

They *do not* project above or beyond the building. They "lose" themselves readily in the wall.

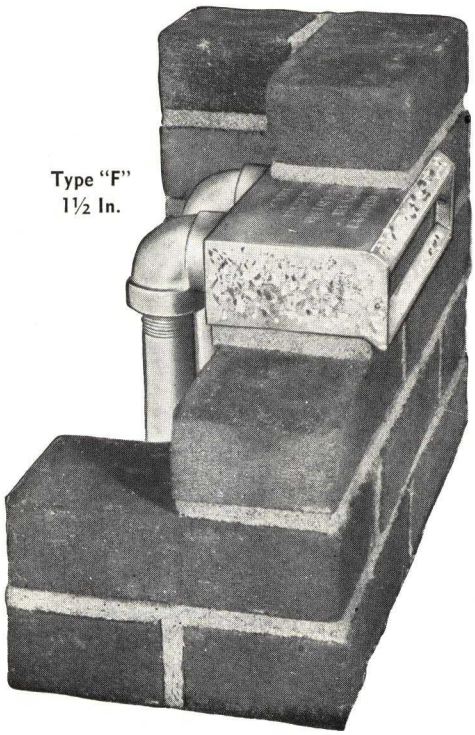
Specifications

Specify under Vent Pipe Heading (specify type, diameter of vent pipe and whether cast iron or bronze) as manufactured by Benjamin Riesner, 353 East 78th Street, New York, N. Y.

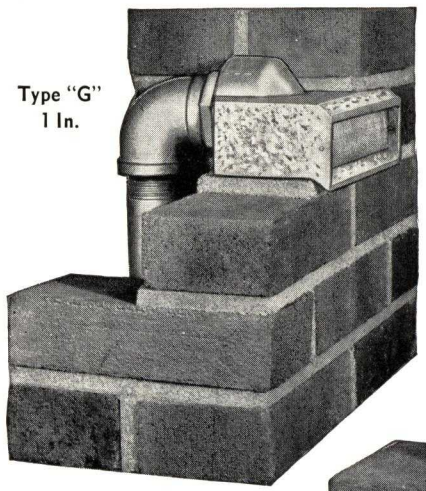
Prices

For all types in Galvanized Cast Iron .....$7.50 each
For al types in Cast Bronze ..... 9.50 each

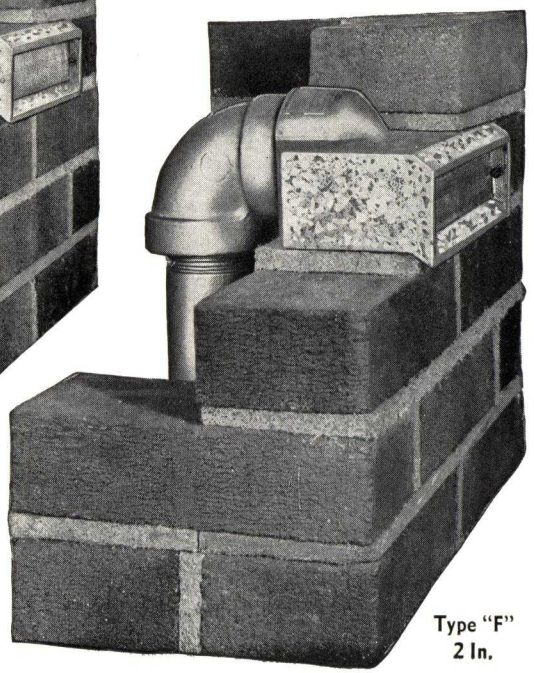
3% discount for cash with order, 2% discount c.o.d., 2% discount 10 days, net 30 days on approved credit rating.
The above prices are f.o.b. New York, N. Y.



Type "F"
1½ In.



Type "G"
1 In.



Type "F"
2 In.

Net Weights

Cast Iron

Type "F,"	1½	in., 7 lbs.	7 oz.
Type "F,"	2	in., 6 lbs.	13 oz.
Type "G,"	1	in., 7 lbs.	10 oz.

Cast Bronze

Type "F,"	1½	in., 8 lbs.	6 oz.
Type "F,"	2	in., 7 lbs.	11 oz.
Type "G,"	1	in., 8 lbs.	10 oz.

H. W. PORTER & Co., INC.

NEWARK, N. J.

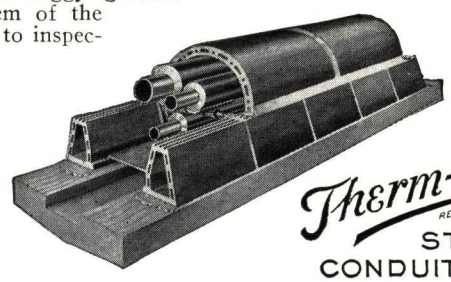
BALTIMORE, MD. CHARLOTTE, N. C. RICHMOND, VA. WASHINGTON, D. C.

THERM-O-TILE, THE MODERN CONDUIT SYSTEM

Description—Therm-O-Tile is a complete conduit system for the permanent support, protection, and insulation of the underground mains of a central heating system.

Foundation—The base of the system is a thick concrete slab poured directly in the trench bottom, reinforced with steel when installed over a filled or boggy ground.

Drainage—The drainage system of the conduit is entirely internal, open to inspection at manholes, and of ample capacity to keep the pipe space dry at all times without any possibility of becoming clogged with silt or vegetation.



Therm-O-Tile
REG U.S. PAT. OFF.
STEAM
CONDUIT SYSTEMS

Pipe Support—All pipes are supported on cast iron adjustable supports resting directly on the concrete base independent of the tile envelope.

Accessibility—All piping is installed before tile is placed, giving complete accessibility for welding, testing, and insulation, pipe fitters working on concrete slab walk-way.

Strength—Due to immovable concrete base and arch construction of extra heavy tile members, conduit will sustain any roadway traffic load usually encountered without extra reinforcement.

Insulation—In this conduit, either sectional pipe covering or asbestos fibre filling may be used for insulation, as insulation space is kept dry at all times by the internal drain. For single or double pipe lines, sectional insulation of economical thickness is recommended; for multiple pipe lines, a filler type of insulation is usually more economical in first cost.

Waterproofing—Under normal soil conditions, this conduit is waterproof. If marshy ground or partially submerged conditions are encountered, the conduit may be made completely waterproof by the use of membrane waterproofing applied under the slab on a sub-base and carried completely over the tile envelope.

Efficiency—The degree of thermal efficiency secured depends upon the type and thickness of insulation used. This conduit, due to its sealed air chambers in the tile and dry insulation space, adds to the normal efficiency of the insulating material on the pipe lines.

SPECIFICATIONS

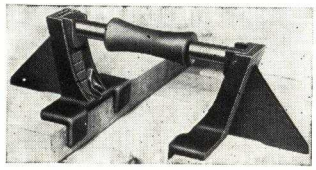
Scope—These specifications are intended to cover the complete installation of an underground steam conduit system, also including excavation, foundation, pipe supports, conduit, and insulation.

Excavation—All trenches for conduit lines shall be run as shown on drawings and excavated to proper levels, as indicated on drawings or by the Engineer.

Foundation—After trench bottom has been leveled to proper grade, contractor shall install a 4-in. thick concrete foundation slab of suitable width to support both piping and conduit envelope. This slab shall be composed of concrete mixed one part portland cement, two and one-half parts sand, and four parts ¾-in. broken stone poured between wood forms and finished to true grade and level. Wherever this slab passes over filled or marshy ground, it must be reinforced with steel as required by the Engineer.

Drainage—A complete drainage system shall be provided beneath pipe chamber of the conduit, of sufficient capacity to keep the pipe space free from water at all times. Drain shall be continuous under all conduit runs and carried around or through manholes in sealed pipe connections with connection at low points leading to sewers or other suitable outlets, as directed by the Engineer.

Pipe Supports—All piping located within conduit shall be supported on cast iron adjustable pipe supports furnished by conduit manufacturer, placed on 12-ft. centers and so designed that all pipe load is transmitted directly to foundation slab independently of the tile conduit envelope.



Pipe Supports

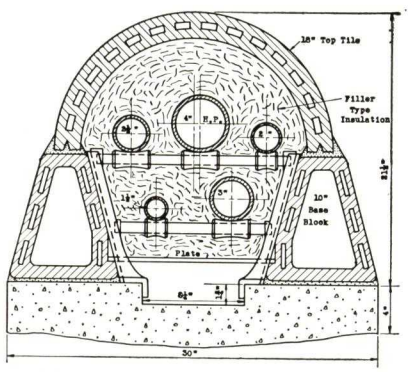
Tile Conduit—After pipe lines have been installed on supports, welded, tested and checked for level, and all anchors and guides have been set and adjusted, they shall be enclosed and protected with Therm-O-Tile steam conduit installed upon the foundation slab in accordance with the manufacturer's written instructions. All tile parts used shall be specially designed for steam conduit service, salt glazed throughout and thoroughly vitrified. All joints in conduit shall be sealed watertight with portland cement mortar and a troweled coating of asphalt mastic applied over all cement joints.

Pipe Insulation—After pipe lines have been tested and approved, they shall be insulated with asbestos sponge-felted sectional pipe covering 2-in. thick for live steam and 1-in. thick for return or hot water lines. At each pipe support a cast iron pipe saddle furnished by conduit manufacturer, designed to allow full thickness of covering to extend between piping and the roller, shall be used. All pipe covering shall be finished with a jacket of heavy asbestos roofing felt secured with No. 16 copper weld wire on 9-in. centers.

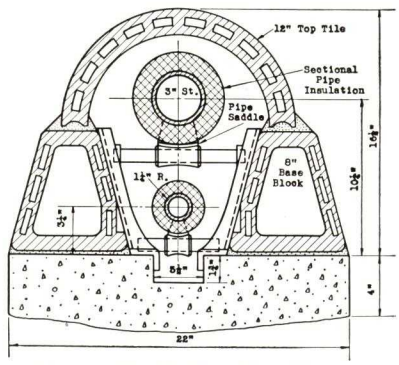
Alternate Insulation—Piping within conduit shall be insulated with an asbestos fibre conduit filling treated to resist moisture, filling entire pipe space and packed to a density of not less than 8½ lbs. per cu. ft. A clearance of at least 2-in. shall be maintained between all pipe lines and between any pipe line and tile, and for steam lines carrying pressures over 50 lbs., space between pipe and tile must be a minimum of 3-in.

Backfilling—After completion of conduit work, all trenches shall be properly backfilled, surface restored to its original condition and lawns, walkways and roadways shall be replaced to the approval of the Engineer.

Efficiency Guarantee—Each contractor bidding shall state in his proposal that the conduit system will give a thermal efficiency of not less than 90% under an approved condensation test.



Multiple Pipe Lines Using Filler Type Insulation



Single or Double Pipe Lines Using Sectional Pipe Insulation

Therm-O-Tile is also sold and installed locally by Johns-Manville Construction Units

THE RIC-WIL COMPANY

Underground Conduit Systems for Heating and Power Pipes

Union Trust Building, CLEVELAND, OHIO

BRANCH OFFICES: NEW YORK, CHICAGO, SAN FRANCISCO
AGENTS IN PRINCIPAL CITIES

Products

RIC-WIL INTERLOCKING CONDUIT and BASE DRAIN FOUNDATION, TILE and CAST IRON; RIC-WIL UNIT STEAM MAIN; "DRY-PAC" WATERPROOF ASBESTOS CONDUIT INSULATION.

REG. U. S. PAT. OFF.

RIC-WIL

Products

ROLLER PIPE SUPPORTS; ALIGNMENT GUIDES; MANHOLE COVERS; ASPHALT JOINT COMPOUND; WATERPROOF ASPHALT PAINT for cement joints; ASPHALT IMPREGNATED FILTER TAPE.

Ric-wiL Interlocking Conduit

Ric-wiL Conduit is first quality, standard weight, vitrified glazed tile of the bell and spigot type.

It is shipped on the job in full round sections and split into top and bottom halves as used. Thickness of tile is reinforced to double strength at top and bottom. When installed, bell and special Loc-liP side joints are sealed with portland cement. Loc-liP joint (see illustrations) is shaped so that cement locks top and bottom halves permanently together in all directions, giving conduit extraordinary rigidity and strength. Leakage is practically impossible. Top and bottom halves are interchangeable (foolproof) and numbered in pairs so that companion pieces may be kept together.

Sections are all in 2-ft. lengths, sizes from 4 to 27-in. inside diameter. Every sixth section of conduit has an opening in the bottom half through which a pipe support of the roller type projects to carry the steam, hot water or oil pipes, thus making the pipe supports independent of the conduit itself, a desirable feature for this class of work.

Ric-wiL Interlocking Base Drain Foundation

Ric-wiL Base Drain Foundation is first quality vitrified glazed tile, so designed that it is both a base for supporting and lining up the conduit and drain for carrying away water which might otherwise accumulate around the conduit. Providing two points of support for the conduit, it adds 35% to the ground load conduit will carry safely, as compared to the same conduit placed on flat ground or broken stone. Top of base drain has slot into which the bell of conduit fits, making sections of conduit and base drain stagger with each other to form a strong interlocking construction. Pipe support saddles rest on the side shoulders, which insure perfect alignment of pipes. Wide flat bottom of base drain makes a solid foundation. Free drainage area of the base drain is large and ample for every practical condition. Made in three sizes to support properly all conduit sizes.

Cast Iron Ric-wiL Conduit

For extra heavy duty under railroads or where conduit is subject to very heavy loads, Ric-wiL is made of cast iron. Has Loc-liP Joint and "interlox" with tile Ric-wiL—made for all 5 types described in next column. A special heavy duty tile base drain or a cast iron base drain is provided for use with Ric-wiL Cast Iron Conduit.

Five Systems to Meet All Conditions

Type F System—For steam heating, power pipes and superheated steam. A conduit that assures super-efficiency when insulated with Dry-paC (description below), or Ric-wiL No. 11 Filler, packed around pipes in closed construction.

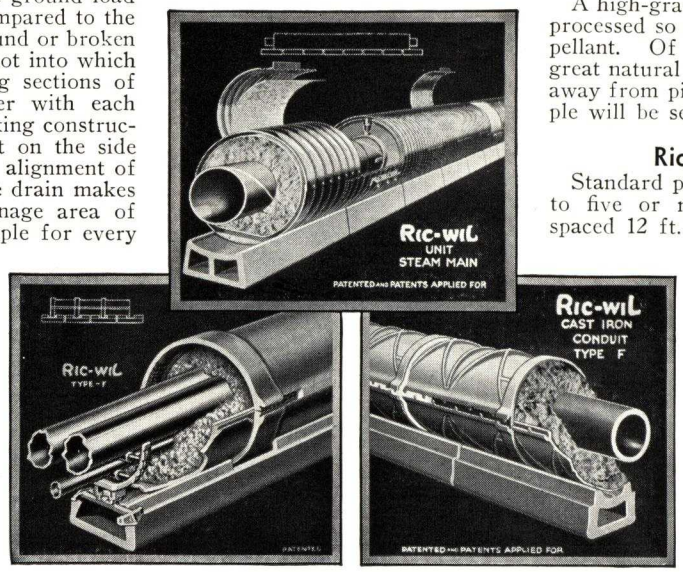
Type SPC System—For steam heating, power pipes and superheated steam. Insulation is any standard make of sectional pipe covering, kind and thickness depending upon service to be rendered. Double drainage is provided in this type.

Type DA System—For hot water, oil transmission and condensation returns. Tile and insulation in one, the latter, a diatomaceous earth mixture of high insulating quality, moulded inside the tile and keyed in. This type insulates the pipes from surrounding ground but not from each other, making it specially adapted to carry oil and steam pipes together for oil transmission. Exceptionally easy to install.

Type DF System—For steam heating, power pipes and superheated steam. This is Type DA with the addition of Ric-wiL Asbestos Conduit Filler to be packed around pipes at a density specified by manufacturer. Filler is a good non-conductor which will not corrode the pipes nor shrink. Dry-paC furnished when specified.

Super-Strength Tile Conduit—To support any average traffic load, is also available. Details on request.

Three Selected Ric-wiL Types



Dry-paC Waterproof Conduit Insulation

A high-grade long fibre asbestos insulation, processed so that it is permanently water repellant. Of unusually high efficiency and great natural strength, it will not slump down away from pipes and is non-corrosive. Sample will be sent gladly for testing.

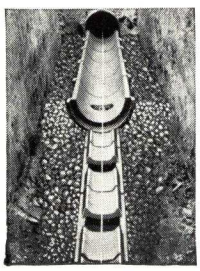
Ric-wiL Pipe Supports

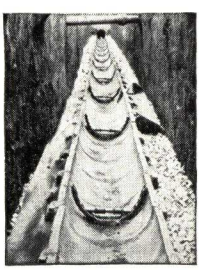
Standard pipe supports will carry from one to five or more pipes and are ordinarily spaced 12 ft. apart. They are strong, made of cast iron, rustproofed, and interlock with the base drain foundation, imposing no load on the conduit itself. No movement of pipes can disturb them. Special pipe supports available for different conditions. Information on request.

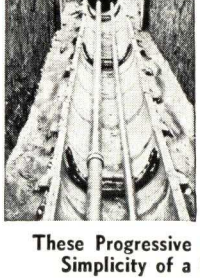
Engineering Service

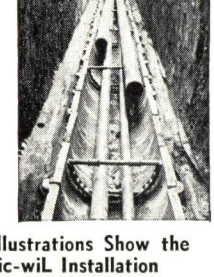
Full co-operation with architects and engineers; complete service details and installation instructions; installation supervision where desired.

Catalogues, test reports, typical specifications, etc., promptly on request.









These Progressive Illustrations Show the Simplicity of a Ric-wiL Installation

AMERICAN FOUNDRY & FURNACE COMPANY

Air Controlling Specialties

BLOOMINGTON, ILL.

Products

WIRE GRILLES and GUARDS; ALUMINUM BACK PRESSURE DAMPERS; FAN LOUVRES; LOUVRE DAMPERS; DIFFUSERS; BY-PASS DAMPERS.

Also Warm Air Heating Apparatus for all services, Mixing Dampers, Access Doors, Manhole Doors, Belt Guards and Ventilators, Penthouses.

Finishes

The standard finish on all grilles and dampers is black duco, black enamel paint or prime coat. Colors at slight extra cost.

Sizes

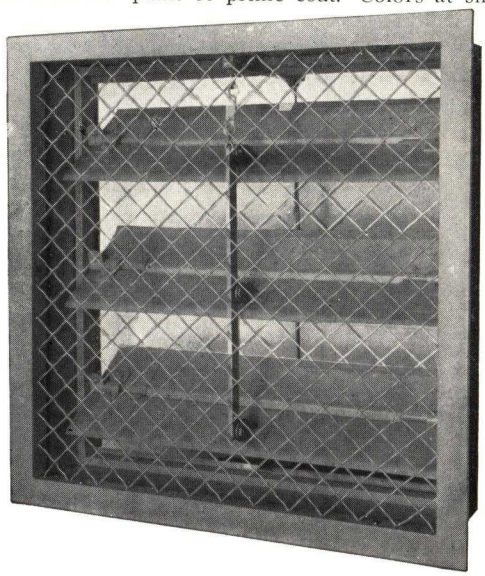
All grilles, diffusers and dampers made in any sizes.

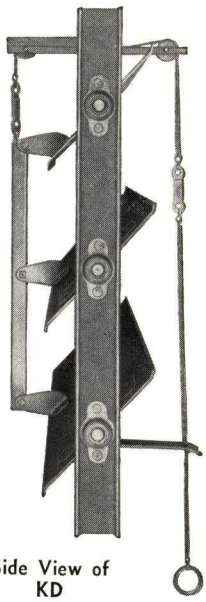
When ordering, give the exact size of opening. An allowance of ¼ in. (smaller) will be made for irregularities, unless ordered otherwise.

Use this form in ordering: Opening ..... inches wide, by ..... inches high.

Catalogue

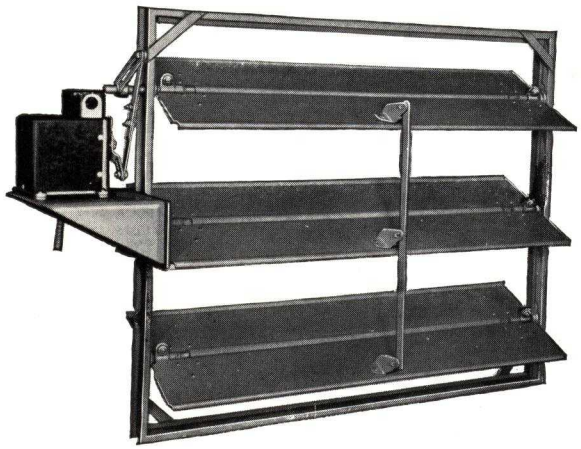
Our catalogue "AFFCO Specialties" will be sent on request.





KD Grille and Fire Damper — **Side View of KD**

A wire grille and angle iron border, with louvres at rear, for use in fresh air or vent openings. Dampers are ball bearing equipped, and operate by chain working through two pulleys and a claw. Pull chain is equipped with fusible link, on both front and rear of louvres. Links melt at 160°—in case of fire, on either side of the louvres, they close automatically by their own weight.



F-12 Louver Damper

F-12 Dampers made to fit any size opening. Adaptable to automatic or hand control. Blades of 16-gauge, 2x½x⅛-in. channel frames, standard except in large sizes—optional ¼x2-in. bar iron frame. Standard, steel black enamel painted—optional, galvanized iron. Copper at extra charge. Ball bearings standard (brass trunnion bearings optional at lower cost). Made for vertical or horizontal installation. For powerhouses, hotels, schools, churches, theaters, etc. *Extra charge for motor brackets for internal or external mounting. Motors and connecting linkage furnished by others.*

F-12 Dampers without brackets are standard

Left:

F-16-Q Mixing Damper

This type of double mixing damper with more than one blade in warm air and tempered air openings furnished when blades are over 24 in. wide; under 24 in., single blades are used (12 in. is maximum width of blade used on F-16-Q). Blade width is dimension other than axle length. *Motor brackets furnished when required at extra charge.* Motors and connecting linkage by others

Right:

S-454 Radio Range Stormproof Louvre Combination

Consists of a galvanized iron frame with 26-gauge galvanized iron stationary horizontal stormproof louvre blades, riveted securely to outside frame and all built into outside wall. At back of stormproof louvres there is a No. 16 copper screen.

Back of louvre is an F-12 multiple blade, ball bearing louvre damper to control volume of air admitted. Louvre damper blades of 16-gauge aluminum. Frame of 2x½x⅛-in. galvanized channel iron.

The F-12 louvre damper can be automatically or manually controlled. Blades all work in unison

Miscellaneous Air Controlling Specialties

We manufacture a large variety of standard and special louvres, dampers, diffusers, etc. We call particular attention to our Field Combination Diffuser and Adjustable Louvre. On this combination rear louvres may be adjusted, to divert air up or down, from the front with a screwdriver. Front louvres to divert air sideways are friction controlled. Send for circular.

We specialize on special dampers for air conditioning units

MEMORANDA

ANEMOSTAT CORPORATION OF AMERICA

Manufacturers of High Velocity Air Diffusers

10 East 39th Street, NEW YORK, N. Y.

THE ANEMOSTAT HIGH VELOCITY AIR DIFFUSER

The Anemostat is an air diffusion device which assures draftless distribution of any volume of air at any velocity.

The Anemostat consists of hollow flaring members placed in certain relationship within each other or in front of each other.

The Anemostat is so constructed that it draws 35% of room air into its hollow members, where the room air mixes with the cooled or heated air before the latter is discharged. (See smoke test illustration.)

Two of the flaring members act as injectors only while the other members have the dual function of ejectors and injectors.

When introducing large quantities of air into a room, air motion results. The Anemostat changes duct velocity into pressure energy and controls this air motion in such a manner that no draft is perceptible. Through the aspiration effect of the Anemostat, a constant, slow, even dual motion, toward and away from the breathing level, is created, which results in complete equalization of the temperature throughout the room, horizontally, and definitely prevents air pockets and dissipates the evaporation aura around the human body.

The air-mixing effect of the Anemostat causes the predetermined room temperature to be established at a point commencing well above the breathing level, which permits the use of higher temperature differentials. This in turn results in smaller volumes of air to be conditioned and therefore in smaller plants, reduced operating expenses and smaller ducts, while the high velocities which may be employed because of the draftless diffusion, result in further reduction of duct sizes and simplification of duct layouts.

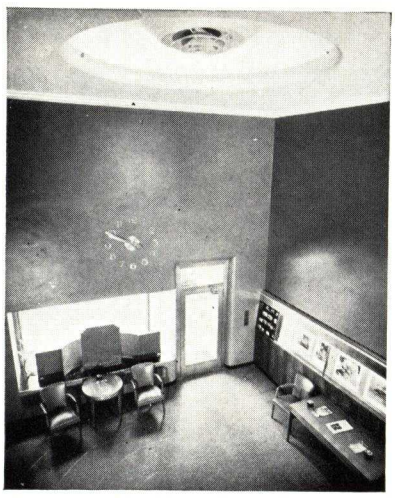
The Anemostat itself creates no noise up to a velocity of 1600 f.p.m. in the duct. However, it does not do away with noise that may be created in the duct. Above 1600 f.p.m. the Anemostat has a moderate decibel rating. The resistance of the Anemostat is $\frac{1}{32}$ in. at a velocity of 1200 f.p.m. in the neck.

The Anemostat is pleasing in appearance and accommodates itself to modern schemes of decoration. The Anemostat may be combined with light fixtures or light effects. The Anemostat is easily fastened to the duct. The Anemostat has no moving parts.

From an Actual Photograph of First Stage of Smoke Test

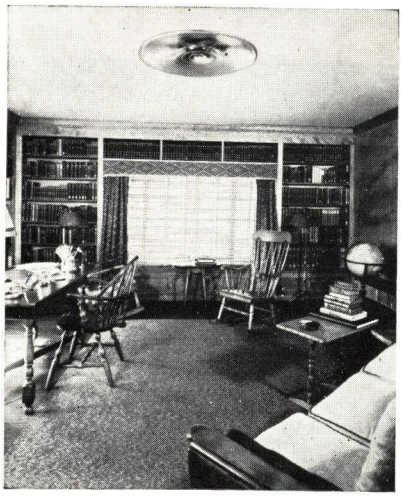
Note the diffusion and aspiration effect of the Anemostat

These Installations Effectively Demonstrate the Anemostat



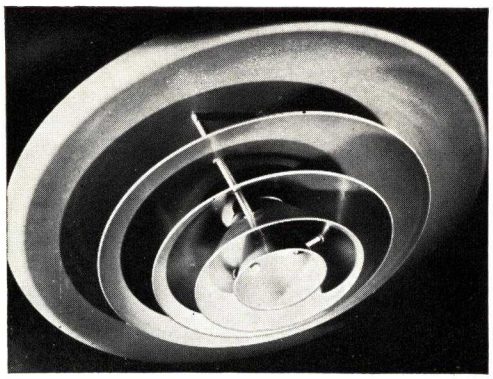
American Air Lines, Inc., Rockefeller Plaza, New York

Auditorium, American Radiator Building, New York



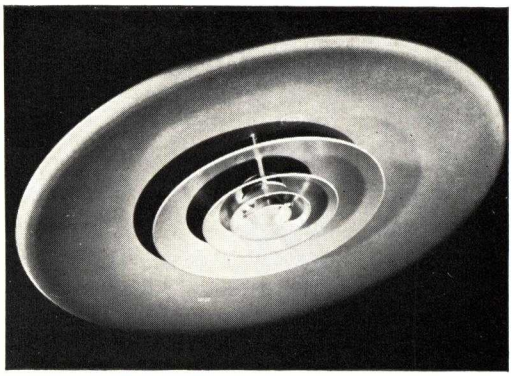
Residence of Harold R. Medina, Esq., Westhampton, L. I., N. Y.

"No Air Conditioning System Is Better Than Its Air Distribution"



Anemostat Type B

Anemostat Type A Combination Device for Supply and Either Extract or Return



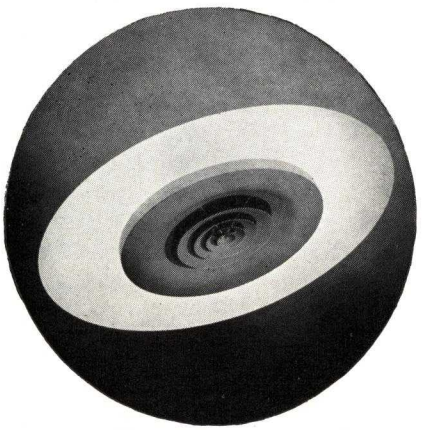
Anemostat Type C

ANEMOSTATS WITH LIGHT FIXTURES

Many unusually attractive combinations with lighting fixtures are possible. Type C is particularly applicable for use with indirect lighting. An effective treatment is to vault sections of the ceiling, fix the Anemostat flush, place the light on top of the outer cone and use the vaulted section as a reflection medium. (See illustration American Radiator Auditorium.)

Suspended fixtures of all types can be hung in the center of Anemostat. Another method is to fasten a slightly convex translucent lens into the space ordinarily occupied by the two center cones. The diffusion and suction lost by the space taken up by the lens is taken care of by modification in the arrangement of the remaining cones.

The Anemostat may be finished with a high polish to act as a reflector.



Anemostat Type C Combined with Indirect Lighting

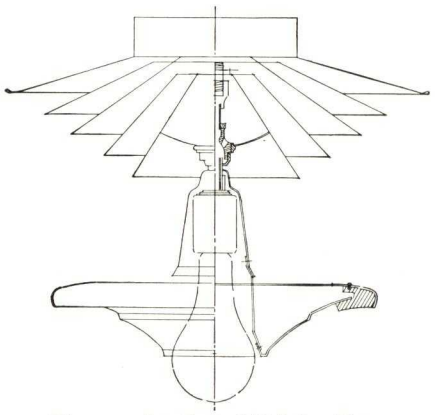
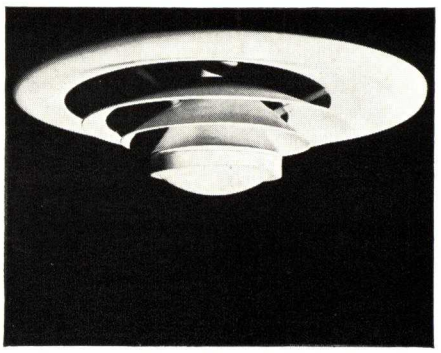


Diagram of a Typical Lighting Fixture

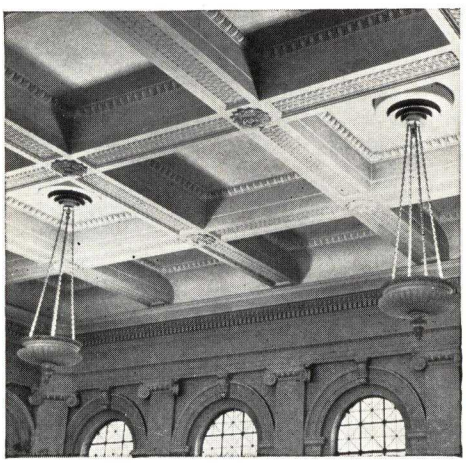


Anemostat Type BL with Light Unit in Center

ADVISORY SERVICE

The uses and applications of the Anemostat are practically limitless within the field which the device serves. We have on our staff engineers who are authorities on air flow and who will be pleased to advise on the proper application of the Anemostat and aid in solving the most difficult problems of air distribution.

These Installations Effectively Demonstrate the Anemostat

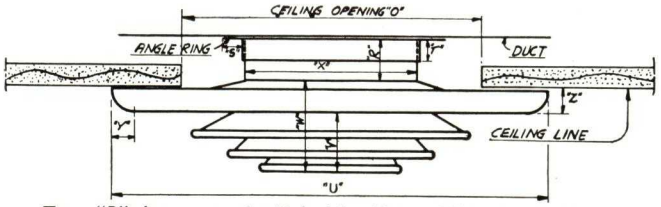


First Church of Christ Scientist, Baltimore, Md.

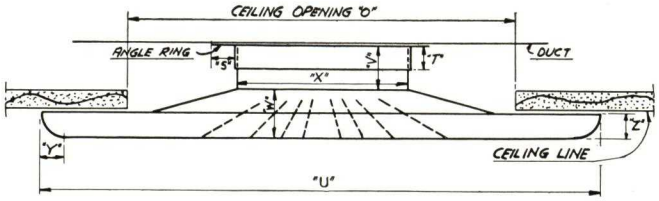
Terminal Beauty Parlor, Chrysler Building, New York

Trans-Lux Theatre, 85th Street and Madison Ave., New York

"No Air Conditioning System Is Better Than Its Air Distribution"



Type "B" Anemostat for Velocities Up to 4000 Ft. per Minute



Type "C" Anemostat for Velocities Up to 2500 Ft. per Minute

TYPE "B"

Size No.	X	U	R	S	T	V	W	Y	Z	O
6	2½	6¼	2	1	1	27/32	1¼	3/8	3/8	5
10	4	10	2	1	1	1 5/16	2	½	½	8
12.5	5	12½	2	1	1	1 5/8	2½	½	½	10
15	6	15	2	1	1	2	3	¾	¾	12
20	8	20	2	1	1	2 11/16	4	1	1	16
25	10	25	2	1	1	3 5/16	5	1	1	20
30	12	30	2	1	1	3 7/8	6	1	1	24
35	14	35	3	1½	1½	4 9/16	7	1¼	1¼	28
40	16	40	3	1½	1½	5 1/8	8	1¼	1¼	32
45	18	45	3	1½	1½	5 11/16	9	1¼	1¼	36
50	20	50	3	1½	1½	6 7/16	10	1½	1½	40
55	22	55	3	1½	1½	7 1/16	11	1½	1½	44
60	24	60	3	1½	1½	7¾	12	1½	1½	48
65	26	65	3	1½	1½	8⅛	13	1½	1½	55
75	30	68	3	1½	1½	8⅞	15	1½	1½	60
95	38	68	3	1½	1½	10⅜	15	1½	1½	60

TYPE "C"

Size No.	X	U	S	T	V	W	Y	Z	O
5	2	6	.....	.....	1	17/32	¼	¼	5
10	4	12	1	1	2	1 1/16	½	¼	10
12.5	5	15	1	1	2	1 11/32	½	¼	13
15	6	18	1	1	2	1 5/8	½	¼	16
20	8	24	1	1	2	2 1/8	½	⅜	21
25	10	30	1	1	2	2 5/8	½	½	26
30	12	36	1	1	2	3¼	⅝	⅝	31
35	14	42	1	1	2	3¾	¾	¾	37
40	16	45	1½	1½	3	4 9/32	¾	¾	40
45	18	48	1½	1½	3	4 13/16	¾	¾	43
50	20	50	1½	1½	3	5 11/32	1	1	44
55	22	55	1½	1½	3	5 7/8	1	1	49
60	24	60	1½	1½	3	6 13/32	1	1	54
65	26	65	1½	1½	3	6 15/16	1	1	60
75	30	58	1½	1½	3	8 1/32	1	1	63

ANEMOSTAT CAPACITY TABLE

How to Use Table

First: Determine the air velocity in duct leading to the Anemostat neck.

Second: Determine the volume of air to be distributed through the Anemostat.

Third: Select in the first horizontal line the figure corresponding to the determined velocity.

Fourth: Follow the column below this figure down to the figure corresponding to the determined volume.

Fifth: Follow the column to the left of this figure to find the size number, neck diameter and area of neck.

Example: Velocity through the Anemostat neck (or duct), 1200 f.p.m. Volume, 650 c.f.m. Anemostat size number, 25. Neck diameter, 10 in. Neck area, 78.54 in.

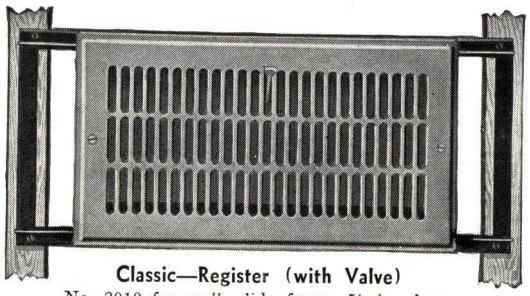
Size No.	Neck diam. "X"	Area of neck sq. in.	Velocities, feet per minute																			
			600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	2500
			Output, Cubic feet per minute																			
1	½	.1964	.81	.95	1.0	1.2	1.3	1.5	1.6	1.7	1.9	2.0	2.1	2.3	2.4	2.5	2.7	2.8	3.0	3.1	3.2	3.4
2	1	.7854	3.2	3.8	4.37	4.9	5.4	5.9	6.5	7.0	7.6	8.1	8.7	9.2	9.8	10.3	10.9	11.4	12.0	12.5	13.1	13.6
3	1¼	1.227	5.1	5.9	6.8	7.6	8.5	9.3	10.3	11.0	11.9	12.7	13.6	14.4	15.4	16.2	17.0	17.9	18.7	19.6	20.4	21.3
4	1½	1.767	7.3	8.6	9.8	11.0	12.2	13.4	14.7	15.9	17.1	18.4	19.6	20.8	22.0	23.3	24.5	25.7	27.0	28.2	29.4	30.6
4.5	1¾	2.405	10.0	11.6	13.3	15.0	16.7	18.3	20	21.7	23.3	25.0	26.7	28.3	30.0	31.7	33.4	35.0	36.7	38.3	40.0	41.7
5	2	3.142	13.1	15.2	17.4	19.6	21.8	24.0	26.1	28.3	30.5	32.7	34.9	37.0	39.3	41.4	43.6	45.8	48.1	50.1	52.4	54.5
6	2½	4.909	20.4	23.8	27.2	30.6	34.1	37.4	40.9	43.6	47.7	51.1	54.5	57.9	61.3	64.7	68.1	71.5	75.0	78.4	81.8	85.2
7	2¾	5.939	24.8	28.8	32.9	37.1	41.2	45.3	49.5	53.6	57.6	61.8	65.9	70.1	74.2	78.3	82.4	86.6	90.6	94.8	98.9	103.1
7.5	3	7.067	29.4	34.3	39.2	44.1	49.1	53.9	58.9	63.7	68.6	73.6	78.5	83.4	88.3	93.2	98.1	103.0	108	112.8	117.8	122.6
8.5	3½	9.621	40.0	46.7	53.4	60.1	66.8	73.4	80.0	86.8	93.5	100.2	106.9	113.5	120.12	126.9	133.6	140.3	147	153.6	160.3	167.0
10	4	12.566	52.4	61.0	69.8	78.5	87.3	95.9	104.6	113.4	122.1	130.8	139.6	148.3	157	165.8	174.6	183.2	192	200.7	209.6	218.1
12	4½	15.904	66.3	77.3	88.4	99.4	110.5	121.4	132.5	143.5	154.9	165.6	177	187.7	199	209.8	221.0	231.9	243	254.0	265.2	276.1
12.5	5	19.635	81.8	95.4	109.1	122.7	136.4	149.9	163.6	177.2	191.0	204.5	218.1	231.4	245.2	259.1	272.8	293.2	300	313.6	327	340.8
15	6	28.27	118	137.4	157.2	176.6	196.5	215.9	235.8	255.2	274.8	294.4	314	333	353.5	373	393.0	412	432	451	471	490
17.5	7	38.48	160	187	214	240	267.5	293	320	347	374.2	400	427	454	480	507	535	561	588	614	642	668
20	8	50.26	209.6	244	279	314	349	383	419	453	489	523	558	593	629	663	698	733	767	802	837	872
22.5	9	63.61	265.6	309	353	399	442	486	531	574	619	662	708	750	796	839	884	927	972	1015	1061	1104
25	10	78.54	327.6	381	436	490	546	599	655	709	764	818	873	927	982	1036	1092	1145	1200	1254	1320	1363
27.5	11	95.0	396	461	528	593	660	725	792	857	924	989	1056	1121	1188	1253	1320	1385	1451	1517	1582	1649
30	12	113.10	471	549	628.8	706	786	863	944	1021	1100	1178	1258	1335	1415	1492	1572	1649	1730	1806	1888	1963
32.5	13	132.73	554	645	736.8	829	921	1013	1166	1198	1290	1382	1472	1566	1659	1751	1842	1935	2025	2119	2210	2304
35	14	153.94	640	748	855.2	962	1069	1175	1280	1389	1495	1603	1710	1871	1920	2031	2138	2244	2350	2458	2562	2672
37.5	15	176.71	736	858	982.4	1104	1228	1349	1472	1595	1718	1840	1961	2086	2208	2331	2452	2577	2700	2822	2941	3067
40	16	201.06	836	977	1116.8	1256	1396	1535	1674	1815	1954	2094	2232	2373	2510	2652	2792	2932	3070	3211	3350	3490
45	18	254.5	1060	1237	1416	1590	1770	1944	2120	2297	2479	2651	2832	3004	3180	3357	3540	3711	3890	4071	4240	4418
50	20	314.2	1310	1527	1744	1963	2180	2400	2619	2836	3050	3272	3488	3709	3925	4145	4360	4582	4800	5017	5240	5441
55	22	380.1	1584	1806	2112	2375	2640	2903	3165	3431	3695	3959	4225	4487	4750	5015	5280	5543	5810	6071	6340	6598
60	24	452	1880	2197	2512	2825	3140	3452	3770	4080	4400	4708	5025	5336	5650	5963	6280	6591	6910	7219	7540	7847
65	26	531	2219	2581	2952	3318	3690	4056	4430	4793	5160	5531	5900	6268	6650	6311	7380	7743	8120	8481	8860	9219
70	28	616	2570	2994	3424	3919	4280	4705	5140	5561	6000	6416	6850	7272	7700	8127	8560	8983	9420	9908	10280	10694
75	30	707	2950	3436	3928	4418	4910	5400	5900	6382	6880	7364	7860	8346	8860	9328	9820	10310	10810	11292	11800	12274
80	32	804	3350	3908	4472	5025	5590	6141	6700	7258	7820	8375	8940	9191	10050	10601	11180	11725	12300	12841	13400	13958
85	34	908	3782	4413	5048	5675	6310	6936	7560	8183	8830	9458	10100	10719	11350	11980	12620	13241	13890	14502	15140	15763
90	36	1018	4240	4948	5648	6462	7060	7770	8480	9190	9890	10604	11300	12018	12720	13431	14120	14845	15520	16259	16950	17673
95	38	1134	4740	5512	6316	7087	7890	8662	9460	10237	11020	11812	12610	13387	14190	14962	15780	16537	17340	18098	18920	19687
100	40	1257	5240	6110	6976	7856	8720	9602	10460	11347	12210	13093	13950	14839	15700	16585	17740	18331	19200	20077	20920	21822

THE AUER REGISTER CO.

Manufacturers Registers and Grilles for Heating, Ventilating, Air Conditioning

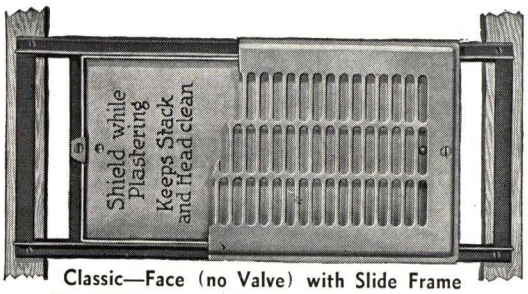
3608 Payne Avenue
CLEVELAND, OHIO

REGISTERS—FOR AIR CONDITIONING—GRILLES



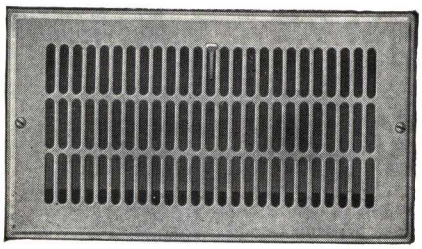
Classic—Register (with Valve)
No. 2010 for *wall*, slide frame 5/8 in. deep
No. 2020 for *base*, slide frame 1 3/8 in. deep

Auer slide frame saves time and cost in installation. Slide frame is made in different depths for baseboard and for wall. Track frame anchors stack head to studs securely and straight.



Classic—Face (no Valve) with Slide Frame
No. 2015 for *wall*, slide frame 5/8 in. deep
No. 2025 for *baseboard*, slide frame 1 3/8 in. deep

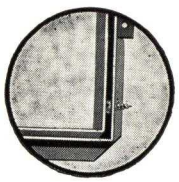
Classic Registers and Grilles have been designed for modern air conditioning and for modern interiors. They can be furnished in all standard sizes and finishes and can also be furnished in other designs. Send for our complete air conditioning catalog.



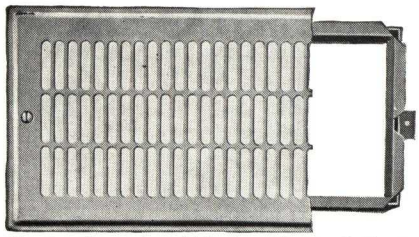
Classic—Register (with Valve) with Band Frame
No. 2030 for *wall*

For installation of this type the band frame is fastened into stack head. The register is then screwed to band frame. Double frame insures tight installation without warping of face.

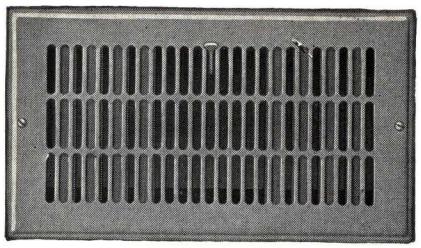
Detail of Double Frame



Shown from Back



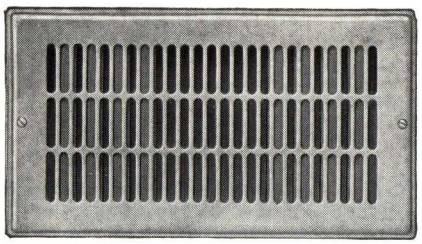
Classic—Face (no Valve) with Band Frame
No. 2035 for *wall*



Classic—Register (with Valve) Directing Air 3-way—Fan-flow
No. 2230C fixed
No. 2130 adjustable

DIRECTING AIR REGISTERS AND GRILLES FOR WALL

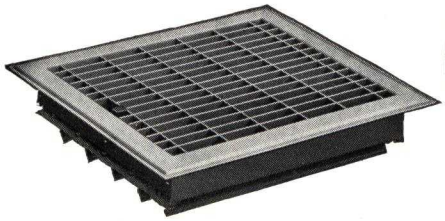
To deflect air all in one direction, or in several directions from the same register or grille. Blades either fixed or adjustable as desired.



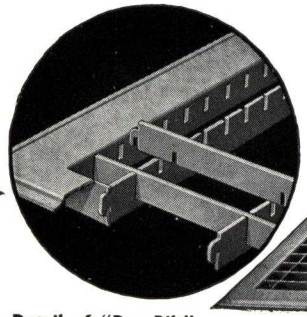
Classic—Face (No Shut-off Valve) with Band Frame (with Directing Blades)
No. 2235C for wall (fixed)
No. 2135 adjustable

Directing Air 3-way—Fan-flow
Directing air blades can be furnished to direct air three ways or all one way

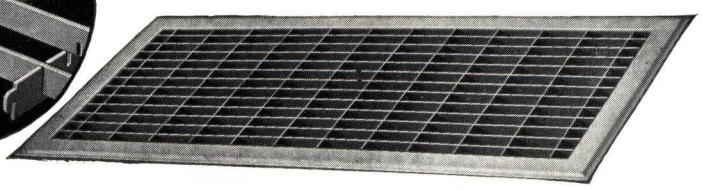
DURABILT REGISTERS AND COLD AIR FACES



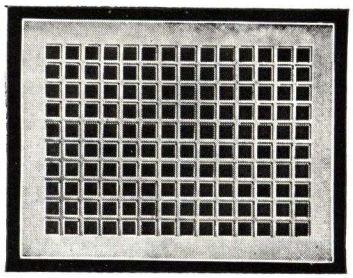
Auer "DuraBilt" Floor Register



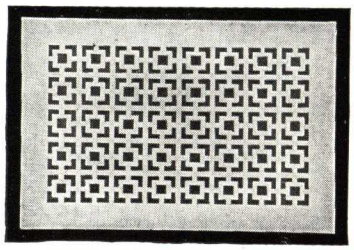
Detail of "DuraBilt" Construction



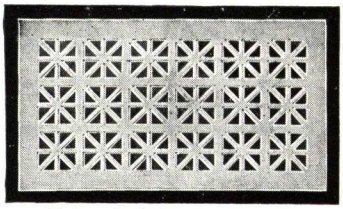
Auer "DuraBilt" Cold Air Face



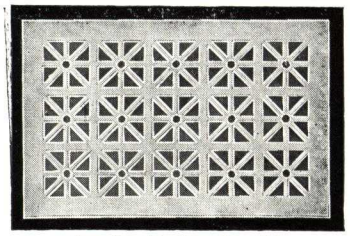
Square Lattice Design No. 5A



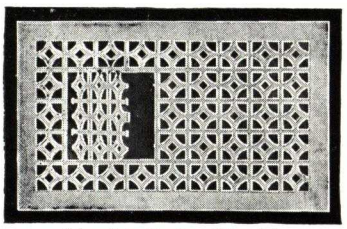
Square Link Design No. 35A



Union Jack Design No. 12A



Grecian Design No. 7A



Moorish Design No. 4A

Some Types and Dimensions of Auer Grilles

Made in all commercial metals, all standard finishes and platings—12 and 10-gauge standard. We also make 16-gauge to ¼ in. thick, on specifications.

All grilles are roller level straightened after perforating.

Invisible access to valve doors can be incorporated in all designs, as shown in No. 4A.

State whether daylight opening or over-all measurement.

SQUARE LATTICE DESIGN

Design No.	Holes, in., sq.	Bars, in.	Free area
8A	½	¼	50%
5A	¾	¼	64%
3AA	15/16	¼	73%
10A	1¾	¼	85%

Design No. 5A (inch multiples) works best to all daylight and over-all sizes. Best adapted for louver registers.

No. 5A can be made ¼ in. and lighter.

No. 3A and No. 8A made 3/16 in. and lighter.

No. 10A made 10-gauge and lighter.

SQUARE LINK NO. 35A

Squares, in.	Bars, in.	Multiples, in., sq.	Free area
1¾	¼	2	51%

Made in 10-gauge and lighter.

UNION JACK DESIGN

No.	Squares, in.	Bars, in.	Multiples, in., sq.	Free area
12A	2½	¼	2¾	50%
12A	2½	½	3	45%
14A	3	3/8	3⅜	55%
14A	3	½	3½	53%
20A	4⅛	⅜	4½	76%

Made in 10-gauge and lighter. No. 20A made in 1/16 in. and lighter.

GRECIAN DESIGN NO. 7A

Squares, in.	Bars, in.	Multiples, in., sq.	Free area
3	⅜	3⅜	55%
3	½	3½	53%
3	¾	3¾	50%

Made in 10-gauge and lighter.

MOORISH DESIGN NO. 4A

Squares, in.	Bars, in.	Multiples, in., sq.	Free area
1¾	¼	2	51%

37A DESIGN

Openings, in.	Bars, in.	Free area
¾x2¾	¼	75%

38A DESIGN

Openings, in.	Bars, in.	Free area
¾ square	¼	64%

A Complete Grille Service

Auer Stamped Metal Grilles can be supplied, on special order, to suit ANY individual requirements as to size and shape, and to harmonize with any particular interior decorative scheme. Steel, stainless steel, brass, or bronze. Get the complete AUER Catalog No. 37.

36A DESIGN

Openings, in.	Bars, in.	Free area
1x1	¼	45%

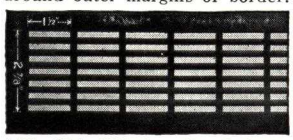
OBLONG DESIGN

No.	Openings, in.	Bars, in.
15A	¾x1½	¼
17A	¾x2¾	¼
31A	3/16x1½	3/16
11A	5/16x1⅝	¼

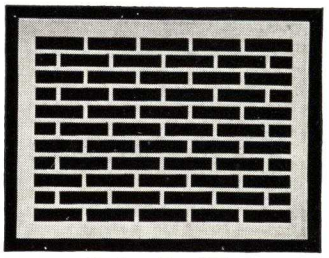
Popular for radiator furniture and concealed radiation.

Shell Design Nos. 13A and 33A

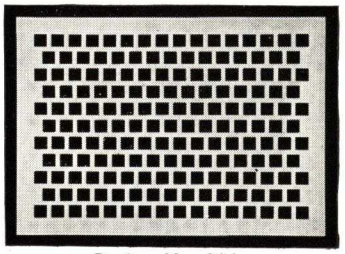
Works in multiples 2x1 in. *No. 13A,* no fractional piercing around outer margins or border.



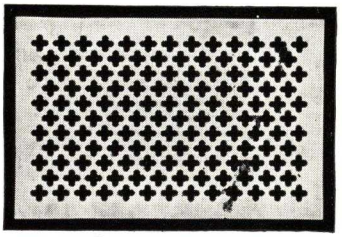
NO. 31A Window Stool Grille



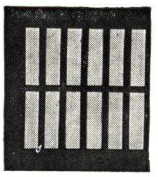
Design No. 37A



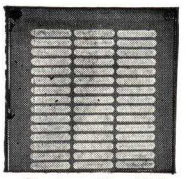
Design No. 38A



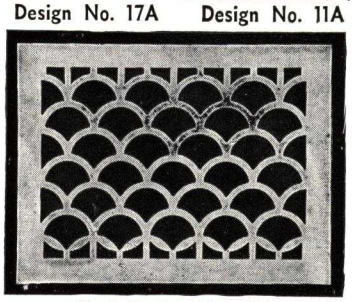
Design No. 36A



Design No. 17A



Design No. 11A



Shell Design No. 33A

AUER MULTIPLE LOUVER STEEL REGISTERS

Fig. K (Pat'd) All-Steel Register for Wall or Ceiling Use

Approved for Government, Hospital and Commercial Buildings. Face is of extra heavy gauge steel, having appearance of *cast* but the unbreakable strength of steel. Made in any size.

Louvers are baked-on japan to prevent rusting.

Faces or grilles can be made in designs shown.

No. 5-A being 1-in. square multiples works best to all daylight openings.

Register faces can be furnished in all standard metals.

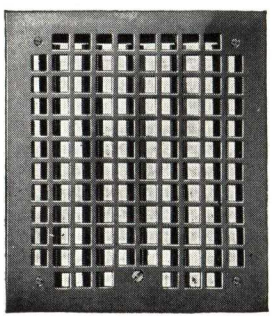


Fig. KL—Key Lock Register

The louvers are operated and locked in various positions by a key

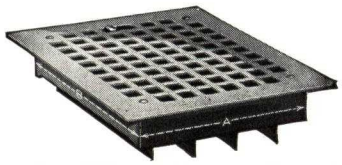


Fig. K—Hand Operated All-steel Register for Wall or Ceiling

Fig. KR—Pole Operating Register

Fitted with ring operating lever so that a window pole can be used to open and close it

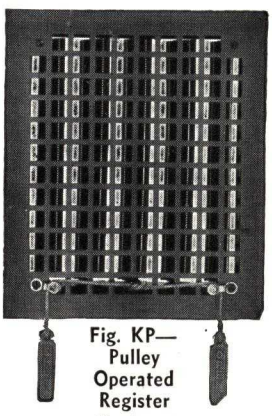


Fig. KP—Pulley Operated Register

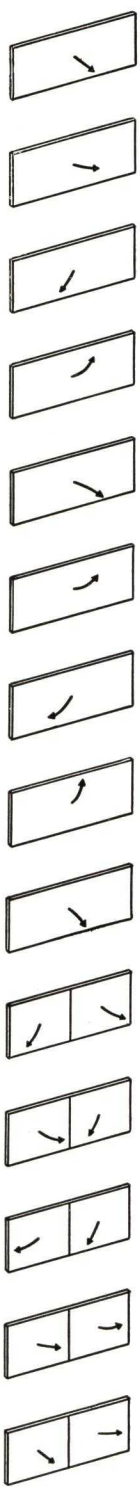
Designate whether wall or ceiling pulleys required

BARBER-COLMAN COMPANY

Manufacturers of Uni-Flo Grilles and Registers

ROCKFORD, ILL.

For our pages on Temperature and Humidity Control Equipment, Garage Doors and Electric Door Operators, see File Index



Models

Uni-Flo grilles and registers, Model E, Model F, and Model M, differ only in frame construction, as indicated by typical illustrations shown on this page.

Model E Grilles and Registers—Of one-piece construction, consisting of the Uni-Flo fin and bar type diffusing core permanently locked into a flanged holding frame. Model EA has a 7/8 in. flange; Model EB has a 1¼ in. flange. Units are offered for sidewall, panel or baseboard mounting, with or without roughing-in frame (not shown) to which stackhead may be secured during construction.

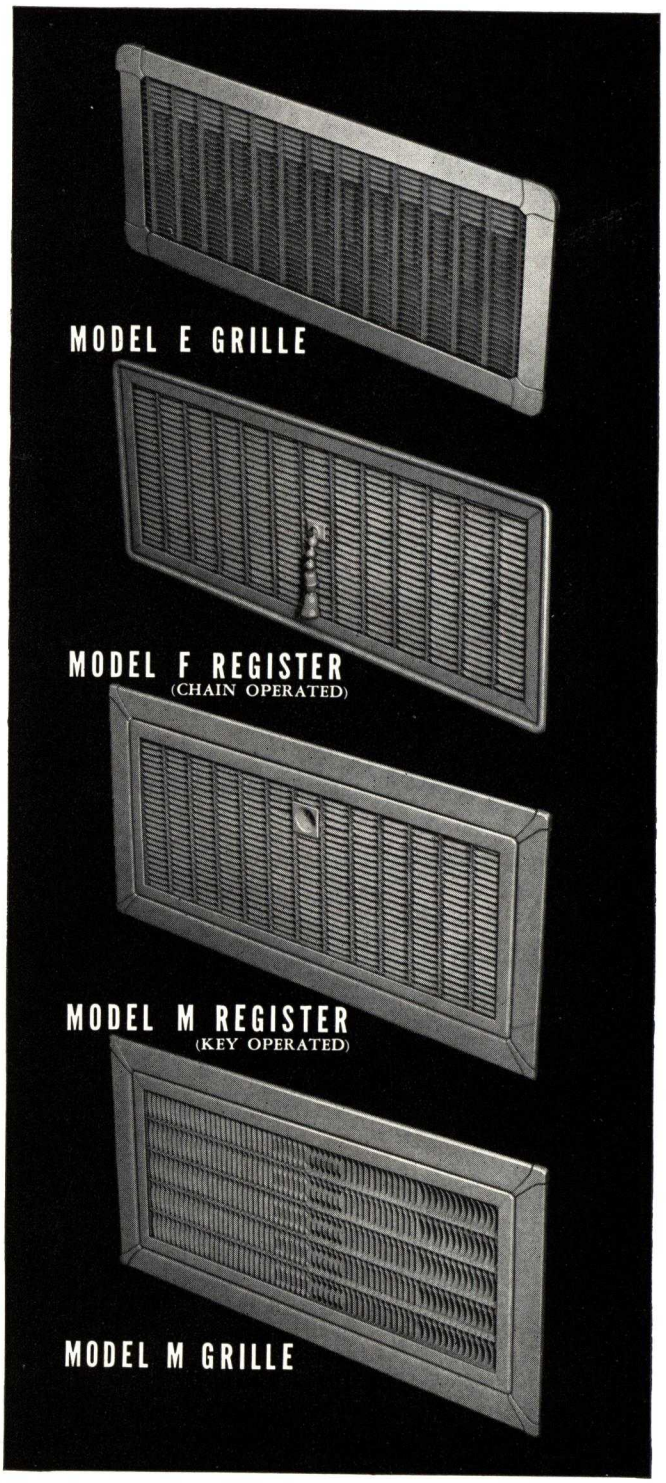
Model F Grilles and Registers—Of two-piece construction consisting of the Uni-Flo core and an independent holding frame. The core member is held in the frame by a spring locking device. No special tools are required for installation. Model F units are especially well adapted to paneled surfaces. Only the beaded edge of the mounting frame is visible after installation.

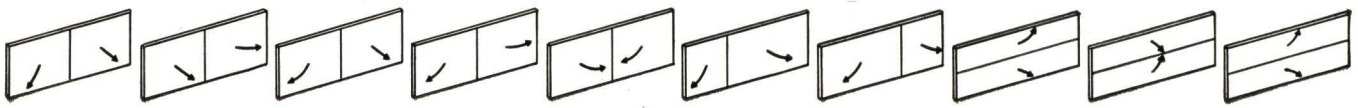
Model M Grilles and Registers—Of two-piece construction and very similar to Model F units, except that a flanged border takes the place of the beaded edge. Model MA has a 7/8 in. flange; Model MB has a 1½ in. flange. Model M units offer a very sturdy construction for exceptionally large grilles or registers. Units larger than 36x 24 in. are fabricated in independently removable sections.

General

The border line of these pages indicates schematically some of the many types of cores available for any Uni-Flo grille or register. Registers are furnished with spring-loaded, positive closing, chain or key operated dampers. Dampers may be hinged at top, bottom, or sides. A wide range of finishes is offered. Model E and Model M units may be had with corner trim plates as illustrated, or with plain mitered corners. Units in special shapes, or formed to fit almost any curved surface, are available.

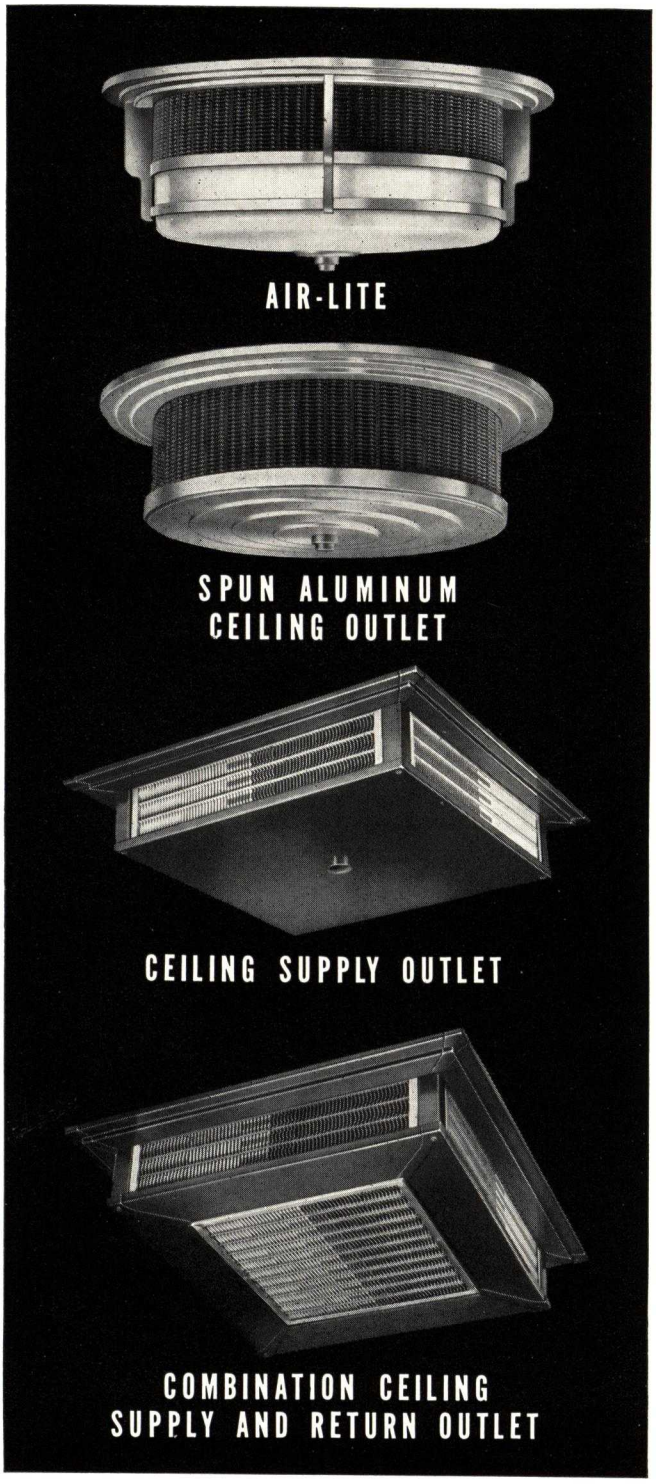
Uni-Flo products also include a special angle fin core for return air outlets; a "sight-tite" unit which obstructs vision at all angles; volume control devices; and an "elbow turn" core which eliminates the necessity for radius turns in ducts and imparts to exposed duct work a beamlike appearance. Consult our local representative or write directly to the factory for complete air distribution design data.





ENGINEERED AIR DISTRIBUTION OUTLETS FEATURING ASPIRATION, DIFFUSION, DIRECTIONAL FLOW

GRILLES **uni-flo** REGISTERS



Air Lite

The Uni-Flo Air-Lite is offered in response to the demand for a ceiling discharge air outlet and lighting fixture combined in a single unit. All-aluminum hanger, satin finish. Typical Uni-Flo air diffusing core through which air is directed by a polished dome-shaped member which also serves as a light reflector. Air-Lites are available in two models: (1) Model LA with 16-in. diameter grille and light bowl; receptacles for three 150-watt light bulbs. (2) Model SA with 12-in. diameter grille and light bowl; receptacles for two 100-watt light bulbs. Units with greater lighting capacity available on special order.

Application—Department stores, drafting rooms, banks, general and private offices; and as a combination *exhaust* and lighting fixture for residential kitchens.

Round Ceiling Outlets

Similar in construction to the grille portion of the Air-Lite. Available with spun aluminum hanger, or pressed steel hanger (illustration shows aluminum unit). Sizes 16 and 12-in. diameter. Core height variable; standard height 4 and 2½ in. respectively. Aluminum units in satin finish only; pressed steel units are offered in variety of finishes.

Square Ceiling Outlets

Fabricated from rolled steel sections with standard Uni-Flo directional flow grilles. Five-way grille in each of four sides as standard; other fin arrangements available on order. Four standard *grille* sizes: 20x4, 24x5, 30x6, 37x7 in.; other sizes available on order. Choice of several finishes; gunmetal finish is standard. Available also in rectangular shapes.

These units are offered in two designs: (a) Supply unit; (b) Combination supply and return unit. The latter is equipped with exhaust connection to grille on under side of unit (see illustrations). Consult our local representative, or write directly to the factory for further information.

uni-fin

Write for literature describing the Uni-fin line of grilles and registers. Uni-fin is designed especially for warm air installations.

MEMORANDA

THE BEST REGISTER COMPANY

Registers, Ventilators, Grilles and Screens

3137 So. Twentieth Street, MILWAUKEE, WIS.

Products

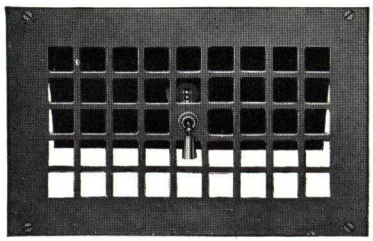
REGISTERS, VENTILATORS, GRILLES and SCREENS, of stock or special designs and finishes, made in cast iron, semi-steel, brass, bronze metal and steel.

AIR CONDITIONING REGISTERS.

MUSHROOM VENTILATORS—SEMI-STEEL REGISTERS.

Also Gratings, Wall Frames, Steel Boxes, Borders, Perforated Steel Grilles, Screens, Special Grilles.

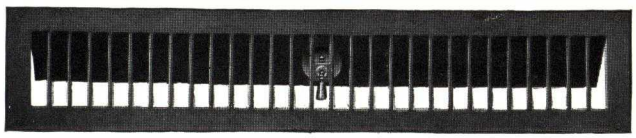
"Best" Air Conditioning Registers



Plain Lattice Register

These registers consist of steel face and one-piece frame. Frame is made of heavy steel with attachment wings for nailing directly to studding on 16 and 32-in. centers. Lath and plaster are applied over wings, the finish plaster being flush with outer surface of frame.

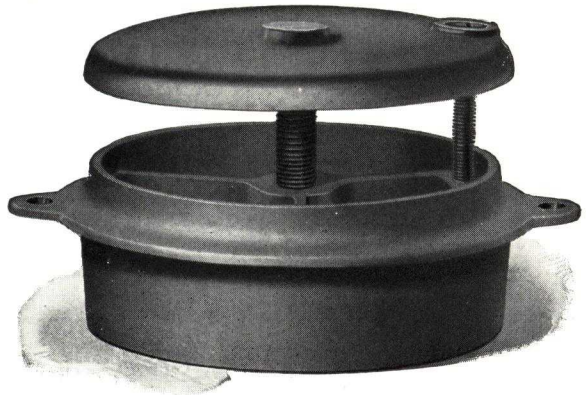
Heavy flange on back of register face clamps edges of stack head tightly against beveled inner surfaces of frame, forming completely air and dust-tight joint. Valve is held in desired position by arrangement of springs, and is operated by chain. Same type frame used whether installed in wall or baseboard. Sizes for every requirement. Furnished in any finish, though usually supplied in prime coat.



Straight Bar Register

Mushroom Ventilators

For use in schools, theatres, churches, and public buildings. Easily and positively adjusted to distribute an equal volume of air.



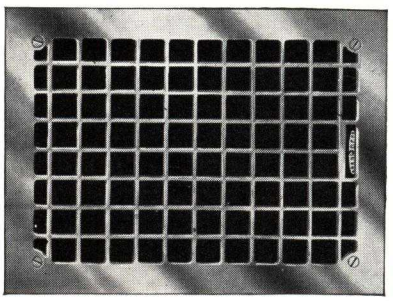
"Best" Mushroom Ventilator

The "Best" Mushroom Ventilator has the following advantages: positive locking feature; no depression in cap to collect dirt; no set-screw projecting; easy, quick and permanent adjustment.

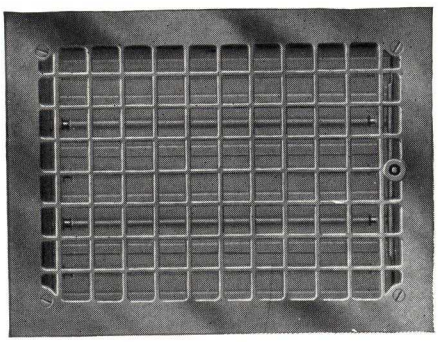
Carried in six sizes: 4, 5, 6, 7, 8 and 10 in. diameter.

"Best" Semi-steel Registers

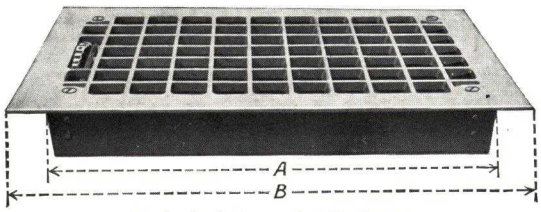
Faces are of cast iron; boxes, valves, operator, etc., of sheet steel. Plain lattice design. Carried in stock in all standard sizes and finishes. Made to special order in any size. Each register is coated with heavy rust-proof metal coating, and carefully inspected. Prices on application.



Plain Lattice Design
Made in any style



Key-operated Register
Phosphor bronze operator parts. Cannot wear or rust out



Method of Measuring Registers
A—Flue or opening size
B—Extreme measurement

Special Designs

Special design goods are made to order only. In all cases, pattern work is necessary to produce. Any design can be produced from architect's drawings or sketches, and can be made to conform to any conditions, and be supplied in any finish.

DIAMOND MANUFACTURING COMPANY

"Diamond" Perforated Metal Grilles, Registers, Cast Grilles, Wire Grilles, Decorative and Industrial Perforated Metal

GENERAL OFFICE AND PLANT
WYOMING, PA.

BRANCH OFFICES

ALBANY, N. Y., 452 Broadway
ATLANTA, GA., P. O. Box 1353
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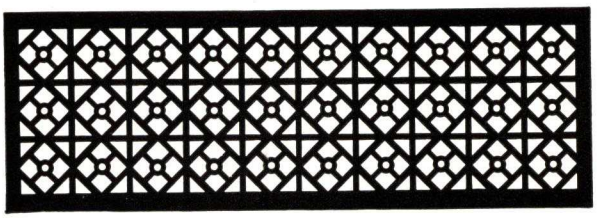
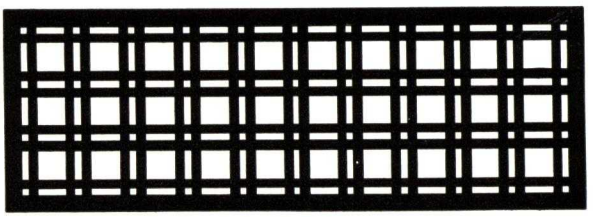
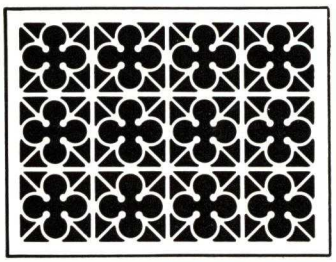
BUFFALO, N. Y., 250 Delaware Avenue
CHARLOTTE, N. C., Box 414
CHICAGO, ILL., 407 So. Dearborn Street
CINCINNATI, OHIO, 104 W. Pearl Street
CLEVELAND, OHIO, 1836 Euclid Avenue
DALLAS, TEX., 208 Construction Building
DETROIT, MICH., 13035 Hillview Avenue
ELIZABETH, N. J., 131 Hallstead Road
HARRISBURG, PA., P. O. Box 82
HAZLETON, PA., 227 E. Broad Street
HOUSTON, TEX., 8241 Brockton Street
LOS ANGELES, CAL., 619 E. 3rd Street
MINNEAPOLIS, MINN., 121 W. Rustic Lodge Avenue
NASHVILLE, TENN., 1207 Warner Building
NEW ORLEANS, LA., 2204 Jefferson Avenue
NEW YORK, N. Y., 7 E. 42nd Street
PHILADELPHIA, PA., 5824 No. 5th Street
PITTSBURGH, PA., 318 Penn Avenue
ROCHESTER, N. Y., 22 Spring Street
ST. LOUIS, MO., 102 No. Broadway
SAN FRANCISCO, CAL., 7 Front Street
SOUTH PORTLAND, ME., 743 Congress Street
SYRACUSE, N. Y., 816 Livingston Avenue
WASHINGTON, D. C., Chandler Building
WESTBURY, N. Y., P. O. Box 775
WORCESTER, MASS., 9 May Street



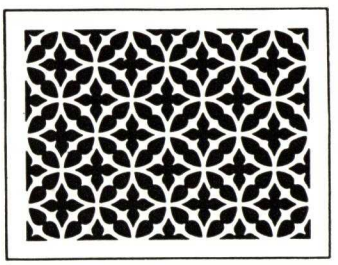
Design K-1—(Two Sizes)—66 and 70% Open Area



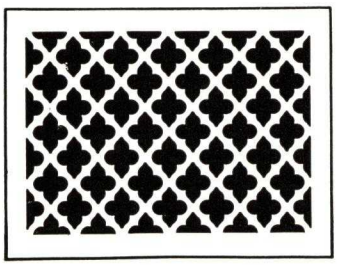
Design K-4—51% Open Area



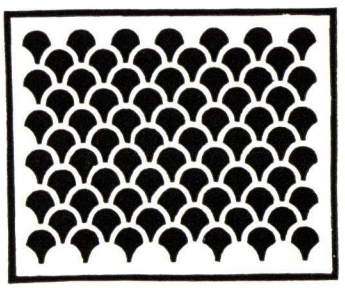
Design J-3—66% Open Area



Design J-2—63% Open Area



Design J-1—72% Open Area



Design F-1—65% Open Area

DIAMOND GRILLES

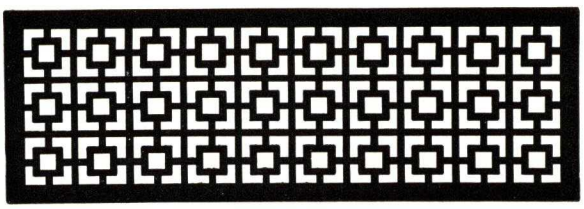
DETAILS AND SPECIFICATIONS

DIAMOND ARCHITECTURAL GRILLES in a completely diversified line of Period, Colonial, Modernistic and Conventional Designs, for every architectural purpose, and particularly suited for ventilation and recessed radiation.

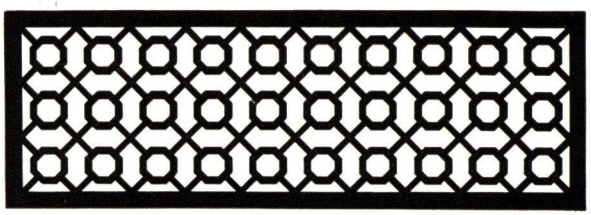
Grilles may be obtained in any metal; thicknesses up to $\frac{3}{16}$ and $\frac{1}{4}$ in., and in size up to 50x120 in. in one piece; larger in sections; panelled with stiffeners.

OTHER PRODUCTS

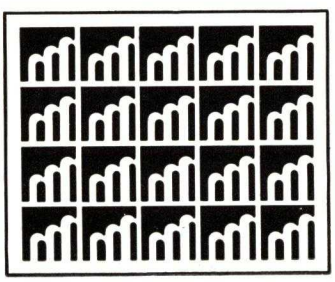
DIAMOND MANUFACTURING COMPANY produces also a complete line of Perforated Metal Sizing Screens, Perforated Metals for Machinery Guards, Elevator Buckets, Conveyor Troughs, Flights and Light Structural Work.



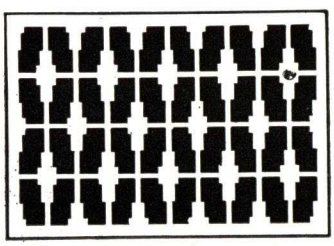
Design K-3—58% Open Area



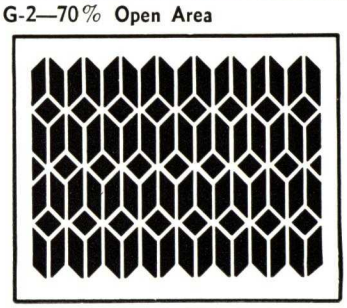
Design G-2—70% Open Area



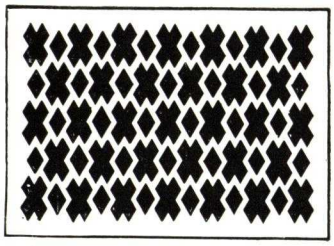
Design 101—55% Open Area



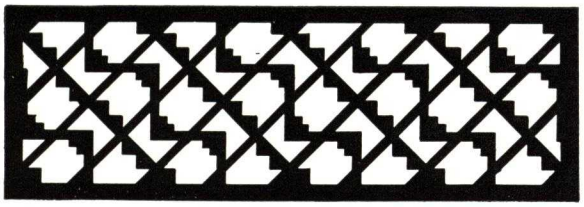
Design 103—52% Open Area



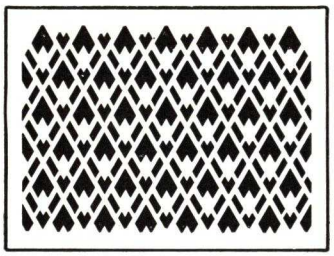
Design 102—55% Open Area



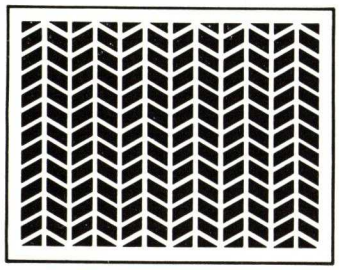
Design 104—70% Open Area



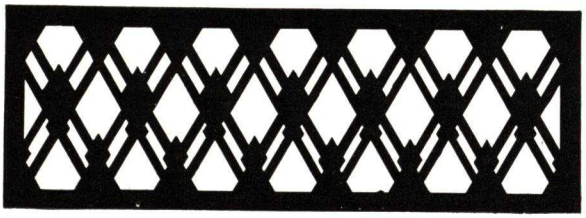
Design 107—55% Open Area



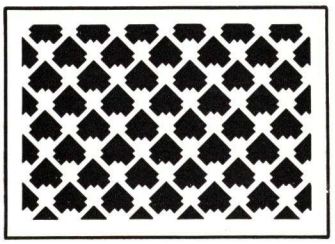
Design 106—45% Open Area



Design 105—55% Open Area

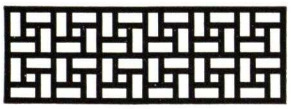


Design 109—55% Open Area

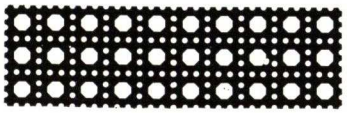


Design 108—57% Open Area

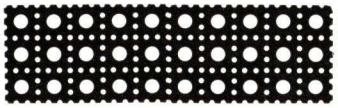
ORNAMENTAL CANE



Tile Cane Design R-17
52% Open Area



Octagon Hole Cane Design R-3
40% Open Area



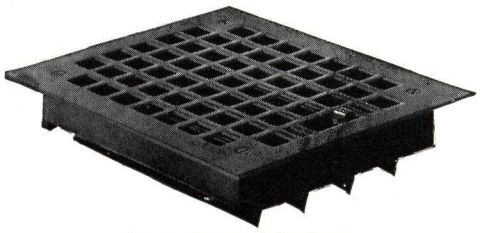
Round Hole Cane Design R-1
33% Open Area

Grecian Cane Design R-18
42% Open Area

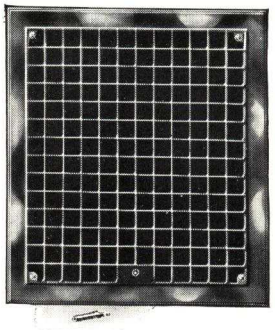
Four cane designs shown above are perforated in 20 to 24-U.S.S. gauge sheets. Sizes 30, 36, 42 in. wide, 96, 120 in. long.

WARM AIR REGISTERS

Governair Direct Flow and Air Controlling Register

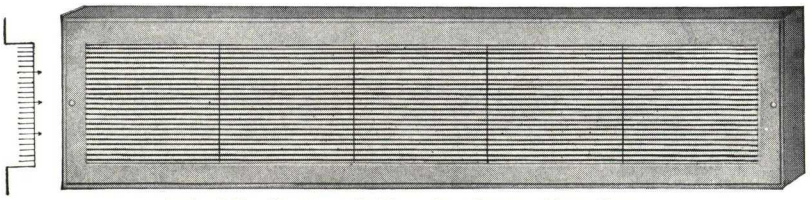


Lever Operated Register
Can also be furnished with a ring for pole operation. The louvres can run either horizontally or vertically

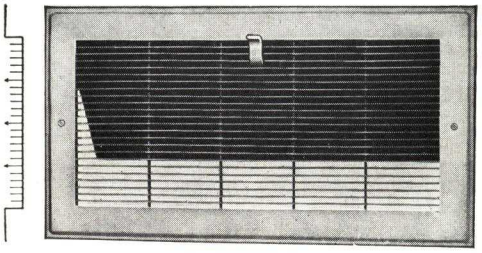


Key Operated Register, Perforated or Embossed Face

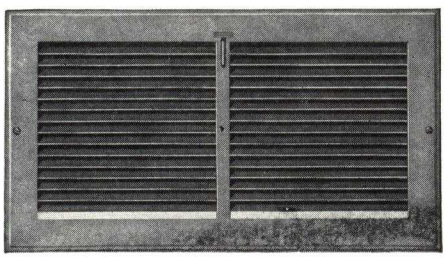
AIR-CONDITIONING REGISTERS AND VENT FACES



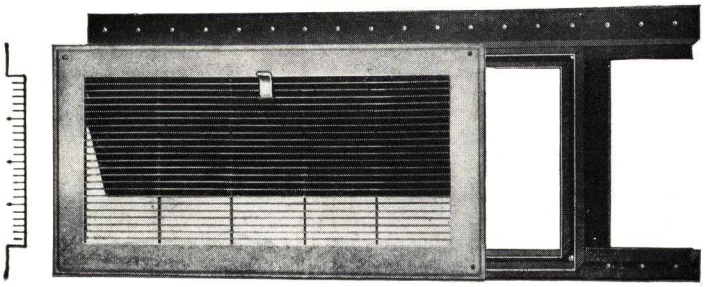
Style 141—Horizontal Close Bar Design Vent Face
Style 142—same as shown but with Vertical Fins



Style 119—Horizontal Close Space Design Register
Straight horizontal air flow



Style 145—One-piece Sidewall Register, Horizontal Bar Design
Bars adjustable from 60° up-flow to 60° down-flow



Style 125—Horizontal Close Bar Design Sidewall Register
Straight flow, complete with stud frame

THE HARRINGTON & KING PERFORATING CO.

Grilles and Registers of Perforated Metal

TELEPHONE
MANsfield 1800

MAIN OFFICE AND FACTORY
5647 Fillmore Street, CHICAGO, ILL.

EASTERN SALES OFFICE: 110 Liberty Street—Telephone, BArclay 7-0203—NEW YORK, N. Y.

REPRESENTATIVES

CINCINNATI, OHIO (1029 Saratoga St., Newport, Ky.)—Telephone, South 0482
CLEVELAND, OHIO, 1000 Keith Bldg.—Telephone, Cherry 3385
DALLAS, TEX., 103 Thomas Bldg.—Telephone, 7-2519
DETROIT, MICH., 226 Murphy Bldg.—Telephone, Cadillac 2047
JOHNSON CITY, TENN., John Sevier Hotel Bldg.—Telephone, 5195
KANSAS CITY, MO., 2119 Washington St.—Telephone, Grand 1535
LOS ANGELES, CALIF., 1725 Venice Blvd.—Telephone, Exposition 7911
OMAHA, NEB., 1015 So. 35th Ave.—Telephone, Webster 3277
PHILADELPHIA, PA., Room 209, 10 So. 18th St.—Telephone, Rittenhouse 7935
PITTSBURGH, PA., 511 Larimer Ave. E. E.—Telephone, Montrose 7954
PORTLAND, ORE., 1900 So. E. Grand Ave.—Telephone, East 0136
ST. LOUIS, MO., 2615 DeKalb St.—Telephone, Laclede 3375
SAN FRANCISCO, CALIF., 636 Potrero Ave.—Telephone, Valencia 2801
WASHINGTON, D. C., 930 E. St., N. W.—Telephone, National 0890

Products

ARCHITECTURAL GRILLES of PERFORATED METALS: these grilles can be furnished in Steel, Bronze (either yellow or commercial), Brass, Aluminum, Monel, Nickel Silver or Stainless Steel.

Grilles of Cast Iron or Cast Bronze, also Registers of multiple louver, air controlling or directional flow type can be furnished.

Our Facilities

Fifty-five years of experience. An enlarged factory and improved equipment. Skilled workmen.

A reputation for fine quality which we insist upon maintaining.

Publications

We will be glad to send gratis upon request our catalog *No. 32—Grilles of Perforated Metal,* which is a combined handbook and catalog showing actual size pictures and tables of opening sizes for each design. A valuable booklet for architects and engineers.

Our new booklet *No. 30—Ornamental Designs,* is in convenient pocket size and presents pictures and size information of all patterns.

Special Features

Many designs can be furnished in Aluminum, Bronze and Nickel Silver as heavy as $\frac{3}{16}$ in. and even $\frac{1}{4}$ in. thick. Handhole doors, frames, hinges, locks, catches, mouldings and other attachments can be furnished as specified.

Designs

Many of our designs are shown on these pages but all of our patterns are shown in our catalog—standard, classic and modern designs to meet your needs or special designs which can be made to your specifications.

Specifications

When writing grille specifications please provide the following information:

Design and grille dimensions—indicate whether dimensions are opening or over-all sizes.

Metal—kind and gauge—($\frac{1}{8}$ in. thick for Bronze and Aluminum—No. 12 U.S.S. Gauge for Steel are most commonly used.)

Finish—

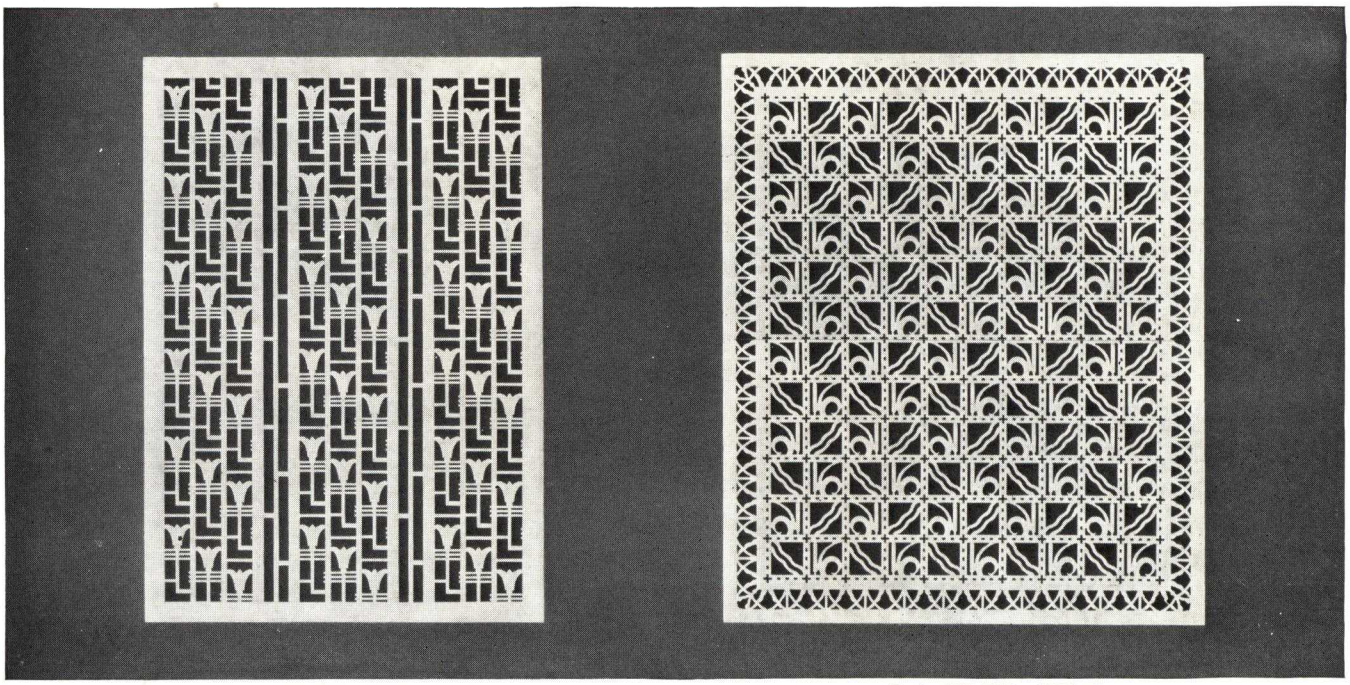
For Steel—shop finish, prime coat, enamel or electroplated.

For Bronze or Brass—natural polish (satin or bright) or electroplated to match standard or special finishes.

For Aluminum—natural satin or bright polish, or Alumilited satin, or bright. (Alumilite is a permanent finish obtained by patented anodic process.

For Monel, Nickel Silver or Stainless—finished in natural color either satin or bright.

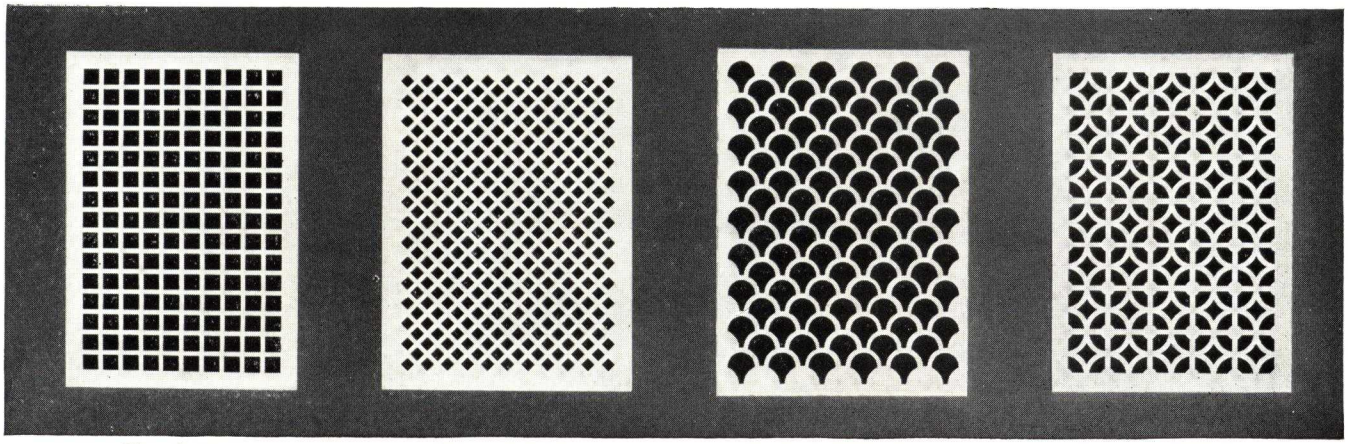
Screwholes, frames, handholes—give complete detail with sketches of all special features required.



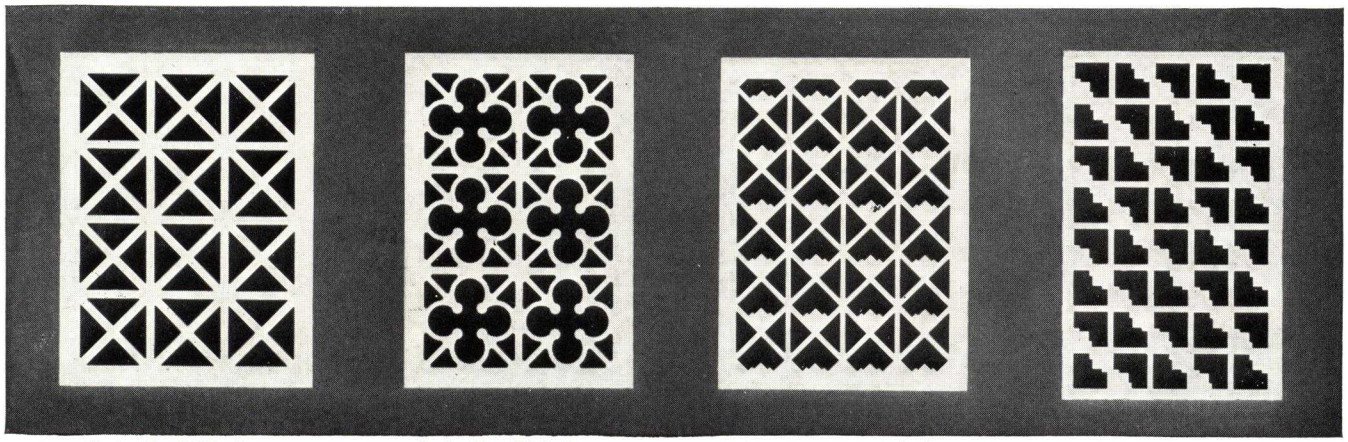
Style HK 790—56% Open

Style HK 745—50% Open

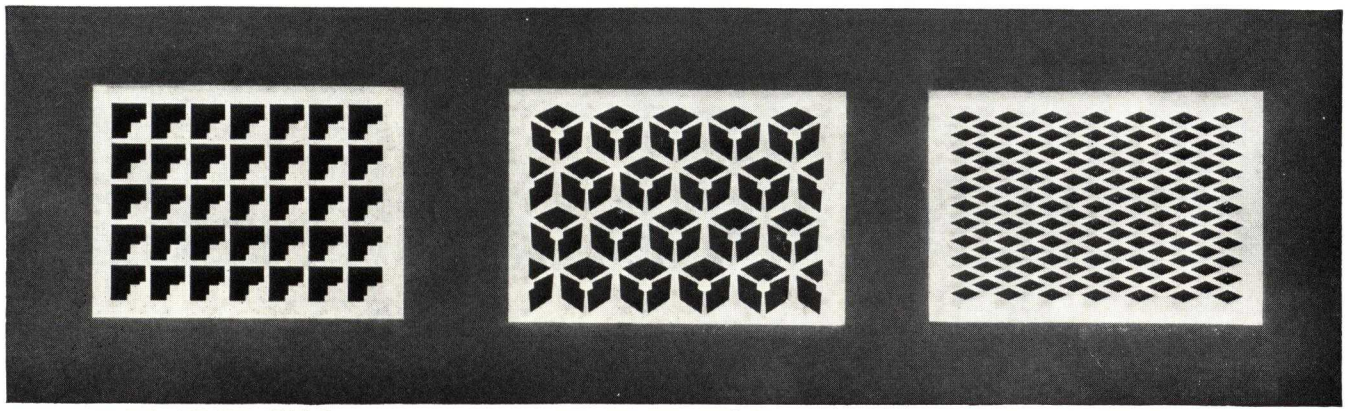
GRILLES OF PERFORATED METAL



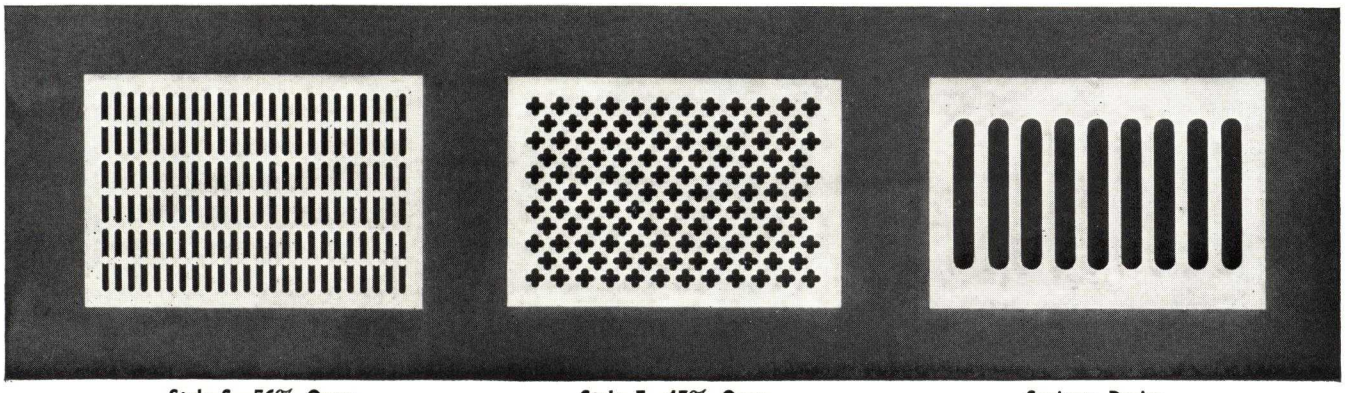
Plain Lattice | Diagonal Lattice | Style J—65% Open | Style M—50% Open



Style Z—70% Open | Style U—66% Open | Style HK 720—62% Open | Style HK 710—63% Open



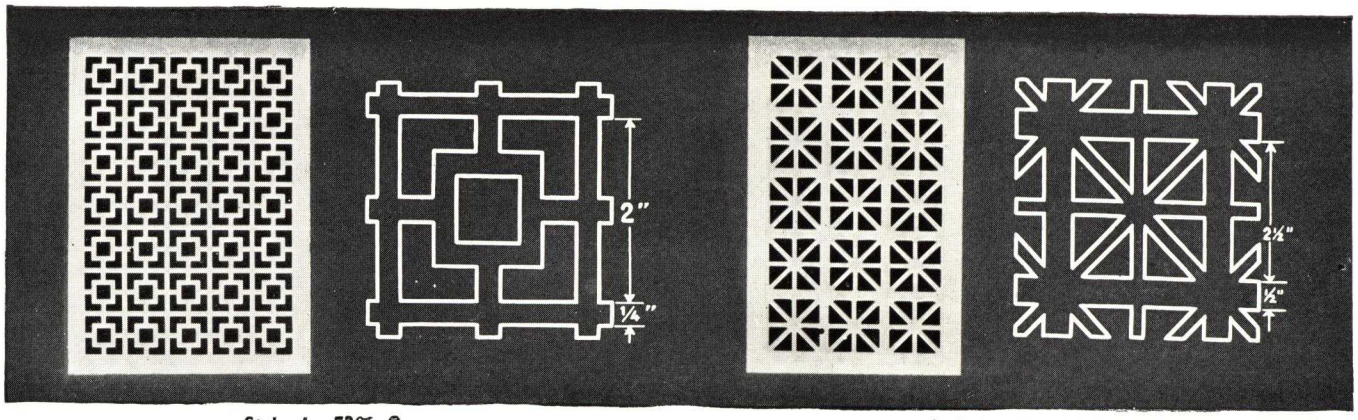
Style HK 715—63% Open | Style HK 750—60% Open | Style E—52% Open



Style S—56% Open | Style F—45% Open | Sanitary Design

HARRINGTON & KING PERFORATING CO.

GRILLES OF PERFORATED METAL



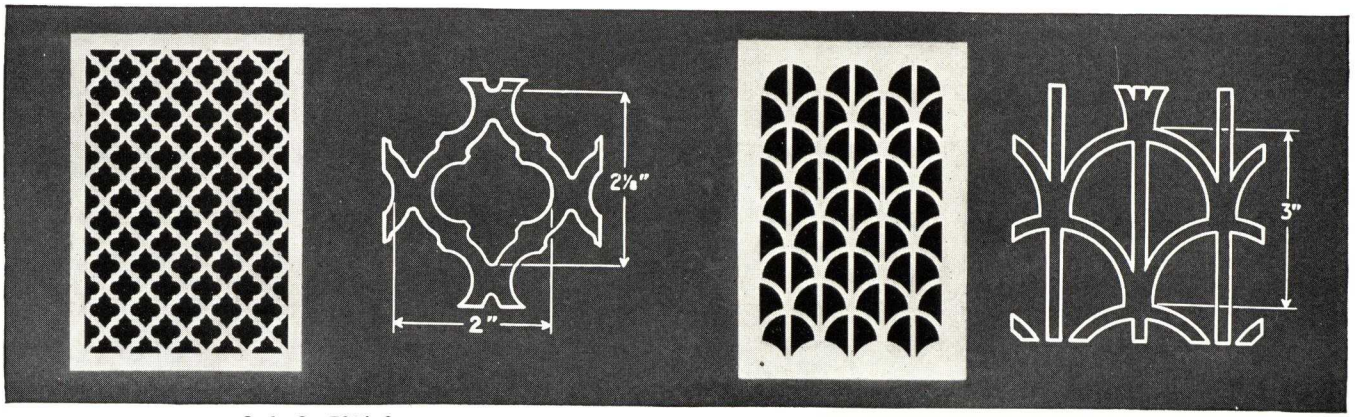
Style A—52% Open
OPENING SIZES

Holes	Opening sizes, in.	Holes	Opening sizes, in.	Holes	Opening sizes, in.	Holes	Opening sizes, in.
1	2	14	31¼	27	60½	40	89¾
2	4¼	15	33½	28	62¾	41	92
3	6½	16	35¾	29	65	42	94¼
4	8¾	17	38	30	67¼	43	96½
5	11	18	40¼	31	69½	44	98¾
6	13¼	19	42½	32	71¾	45	101
7	15½	20	44¾	33	74	46	103¼
8	17¾	21	47	34	76¼	47	105½
9	20	22	49¼	35	78½	48	107¾
10	22¼	23	51½	36	80¾	49	110
11	24½	24	53¾	37	83	50	112¼
12	26¾	25	56	38	85¼	51	114½
13	29	26	58¼	39	87½	52	116¾

Style L—39% Open
OPENING SIZES

Holes	Opening sizes, in.	Holes	Opening sizes, in.	Holes	Opening sizes, in.
1	2½	14	41½	27	80½
2	5½	15	44½	28	83½
3	8½	16	47½	29	86½
4	11½	17	50½	30	89½
5	14½	18	53½	31	92½
6	17½	19	56½	32	95½
7	20½	20	59½	33	98½
8	23½	21	62½	34	101½
9	26½	22	65½	35	104½
10	29½	23	68½	36	107½
11	32½	24	71½	37	110½
12	35½	25	74½	38	113½
13	38½	26	77½	39	116½

Write for information about larger sizes



Style C—72% Open
OPENING SIZES

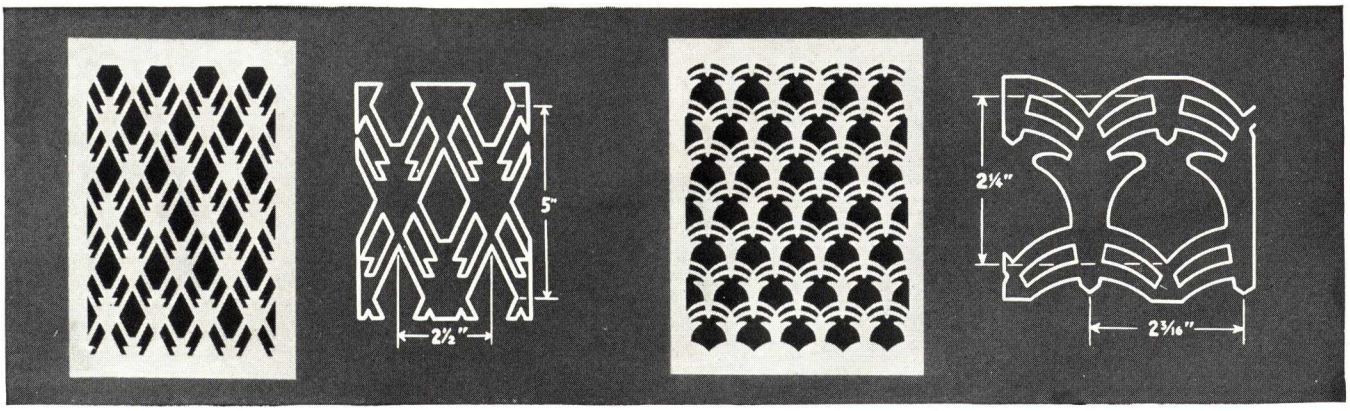
No. of Units	Opening Width, in.	Opening Heig ht, in.	No. of Units	Opening Width, in.	Opening Height, in.	No. of Units	Opening Width, in.	Opening Height, in.
1	2	2⅛	41	42	44⅝	81	82	87⅛
3	4	4¼	43	44	46¾	83	84	89¼
5	6	6⅜	45	46	48⅞	85	86	91⅜
7	8	8½	47	48	51	87	88	93½
9	10	10⅝	49	50	53⅛	89	90	95⅝
11	12	12¾	51	52	55¼	91	92	97¾
13	14	14⅞	53	54	57⅜	93	94	99⅞
15	16	17	55	56	59½	95	96	102
17	18	19⅛	57	58	61⅝	97	98	104⅛
19	20	21¼	59	60	63¾	99	100	106¼
21	22	23⅜	61	62	65⅞	101	102	108⅜
23	24	25½	63	64	68	103	104	110½
25	26	27⅝	65	66	70⅛	105	106	112⅝
27	28	29¾	67	68	72¼	107	108	114¾
29	30	31⅞	69	70	74⅜	109	110	116⅞
31	32	34	71	72	76½	111	112	119
33	34	36⅛	73	74	78⅝	113	114	121⅛
35	36	38¼	75	76	80¾	115	116	123¼
37	38	40⅜	77	78	82⅞	117	118	125⅜
39	40	42½	79	80	85	119	120	127½

Style Q—65% Open
OPENING SIZES

No. of Holes	Opening Width, in.	Opening Height, in.	No. of Holes	Opening Width, in.	Opening Height, in.	No. of Holes	Opening Width, in.	Opening Height, in.
1	2¾	2	21	32¾	32	41	62¾	62
2	4¼	3½	22	34¼	33½	42	64¼	63½
3	5¾	5	23	35¾	35	43	65¾	65
4	7¼	6½	24	37¼	36½	44	67¼	66½
5	8¾	8	25	38¾	38	45	68¾	68
6	10¼	9½	26	40¼	39½	46	70¼	69½
7	11¾	11	27	41¾	41	47	71¾	71
8	13¼	12½	28	43¼	42½	48	73¼	72½
9	14¾	14	29	44¾	44	49	74¾	74
10	16¼	15½	30	46¼	45½	50	76¼	75½
11	17¾	17	31	47¾	47	51	77¾	77
12	19¼	18½	32	49¼	48½	52	79¼	78½
13	20¾	20	33	50¾	50	53	80¾	80
14	22¼	21½	34	52¼	51½	54	82¼	81½
15	23¾	23	35	53¾	53	55	83¾	83
16	25¼	24½	36	55¼	54½	56	85¼	84½
17	26¾	26	37	56¾	56	57	86¾	86
18	28¼	27½	38	58¼	57½	58	88¼	87½
19	29¾	29	39	59¾	59	59	89¾	89
20	31¼	30½	40	61¼	60½	60	91¼	90½

Write for information about larger sizes

GRILLES OF PERFORATED METAL



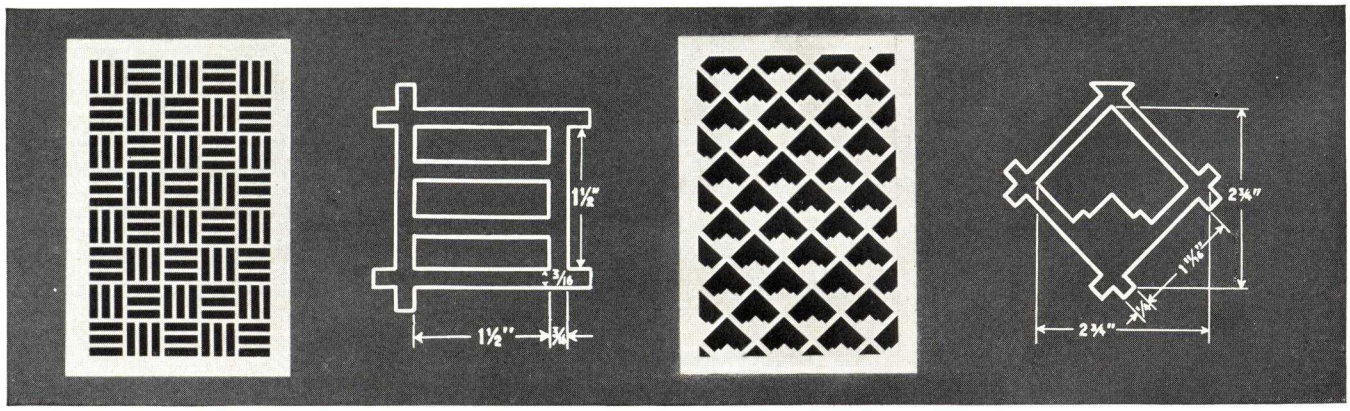
Style HK725—50% Open
OPENING SIZES

No. of Units	Opening Width, in.	Opening Height, in.	No. of Units	Opening Width, in.	Opening Height, in.	No. of Units	Opening Width, in.	Opening Height, in.
1	2 3/16	5	13	32 3/16	35	25	62 3/16	65
2	4 11/16	7½	14	34 11/16	37½	26	64 11/16	67½
3	7 3/16	10	15	37 3/16	40	27	67 3/16	70
4	9 11/16	12½	16	39 11/16	42½	28	69 11/16	72½
5	12 3/16	15	17	42 3/16	45	29	72 3/16	75
6	14 11/16	17½	18	44 11/16	47½	30	74 11/16	77½
7	17 3/16	20	19	47 3/16	50	31	77 3/16	80
8	19 11/16	22½	20	49 11/16	52½	32	79 11/16	82½
9	22 3/16	25	21	52 3/16	55	33	82 3/16	85
10	24 11/16	27½	22	54 11/16	57½	34	84 11/16	87½
11	27 3/16	30	23	57 3/16	60	35	87 3/16	90
12	29 11/16	32½	24	59 11/16	62½	36	89 11/16	92½

Style HK230—56% Open
OPENING SIZES

No. of Units	Opening Width, in.	Opening Height, in.	No. of Units	Opening Width, in.	Opening Height, in.	No. of Units	Opening Width, in.	Opening Height, in.
1	2 3/16	2¼	13	28 7/16	26¼	25	54 11/16	50¼
2	4 3/8	4¼	14	30 5/8	28¼	26	56 7/8	52¼
3	6 9/16	6¼	15	32 13/16	30¼	27	59 1/16	54¼
4	8¾	8¼	16	35	32¼	28	61¼	56¼
5	10 15/16	10¼	17	37 3/16	34¼	29	63 7/16	58¼
6	13 1/8	12¼	18	39 3/8	36¼	30	65 5/8	60¼
7	15 5/16	14¼	19	41 9/16	38¼	31	67 13/16	62¼
8	17½	16¼	20	43¾	40¼	32	70	64¼
9	19 11/16	18¼	21	45 15/16	42¼	33	72 3/16	66¼
10	21 7/8	20¼	22	48 1/8	44¼	34	74 3/8	68¼
11	24 1/16	22¼	23	50 5/16	46¼	35	76 9/16	70¼
12	26¼	24¼	24	52½	48¼	36	78¾	72¼

Write for information about larger sizes



Style HK111—60% Open
OPENING SIZES

No. of Units	Opening sizes, in.	No. of Units	Opening sizes, in.	No. of Units	Opening sizes, in.
1	1½	21	35¼	41	69
2	3 3/16	22	36 15/16	42	70 11/16
3	4 7/8	23	38 5/8	43	72 3/8
4	6 9/16	24	40 5/16	44	74 1/16
5	8¼	25	42	45	75¾
6	9 15/16	26	43 11/16	46	77 7/16
7	11 5/8	27	45 3/8	47	79 1/8
8	13 5/16	28	47 1/16	48	80 13/16
9	15	29	48¾	49	77 1/16
10	16 11/16	30	50 7/16	50	79 1/8
11	18 3/8	31	52 1/8	51	80 13/16
12	20 1/16	32	53 13/16	52	82½
13	21¾	33	55½	53	84 3/16
14	23 7/16	34	57 3/16	54	85 7/8
15	25 1/8	35	58 7/8	55	87 9/16
16	26 13/16	36	60 9/16	56	89¼
17	28½	37	62¼	57	90 15/16
18	30 3/16	38	63 15/16	58	92 5/8
19	31 7/8	39	65 5/8	59	94 5/16
20	33 9/16	40	67 5/16	60	96

Style HK705—63% Open
OPENING SIZES

No. of Units	Opening Width, in.	Opening Height, in.	No. of Units	Opening Width, in.	Opening Height, in.	No. of Units	Opening Width, in.	Opening Height, in.
1	2¾	3¾	21	30¼	31¼	41	57¾	58¾
2	4 1/8	5 1/8	22	31 5/8	32 5/8	42	59 1/8	60 1/8
3	5½	6½	23	33	34	43	60½	61½
4	6 7/8	7 7/8	24	34 3/8	35 3/8	44	61 7/8	62 7/8
5	8¼	9¼	25	35¾	36¾	45	63¼	64¼
6	9 5/8	10 5/8	26	37 1/8	38 1/8	46	64 5/8	65 5/8
7	11	12	27	38½	39½	47	66	67
8	12 3/8	13 3/8	28	39 7/8	40 7/8	48	67 3/8	68 3/8
9	13¾	14¾	29	41¼	42¼	49	68¾	69¾
10	15 1/8	16 1/8	30	42 5/8	43 5/8	50	70 1/8	71 1/8
11	16½	17½	31	44	45	51	71½	72½
12	17 7/8	18 7/8	32	45 3/8	46 3/8	52	72 7/8	73 7/8
13	19¼	20¼	33	46¾	47¾	53	74¼	75¼
14	20 5/8	21 5/8	34	48 1/8	49 1/8	54	75 5/8	76 5/8
15	22	23	35	49½	50½	55	77	78
16	23 3/8	24 3/8	36	50 7/8	51 7/8	56	78 3/8	79 3/8
17	24¾	25¾	37	52¼	53¼	57	79¾	80¾
18	26 1/8	27 1/8	38	53 5/8	54 5/8	58	81 1/8	82 1/8
19	27½	28½	39	55	56	59	82½	83½
20	28 7/8	29 7/8	40	56 3/8	57 3/8	60	83 7/8	84 7/8

Write for information about larger sizes

HENDRICK MANUFACTURING COMPANY

Hendrick Perforated Metal Grilles

21 Dundaff Street, CARBONDALE, PA.

SALES OFFICES IN PRINCIPAL CITIES—CONSULT TELEPHONE DIRECTORY

Product

HENDRICK PERFORATED METAL GRILLES.
For Mitco Open Steel Flooring, Mitco Armorgrids and Mitco Shur-Site Treads, see File Index.

Hendrick Perforated Metal Grilles

To the manufacture of perforated grilles, Hendrick brings an experience of over 50 years in the perforating of metals. All Hendrick Grilles are characterized by clean-cut perforations and fine finish. They are made of rolled metals to insure greater durability and freedom from brittleness.

Special and Standard Designs

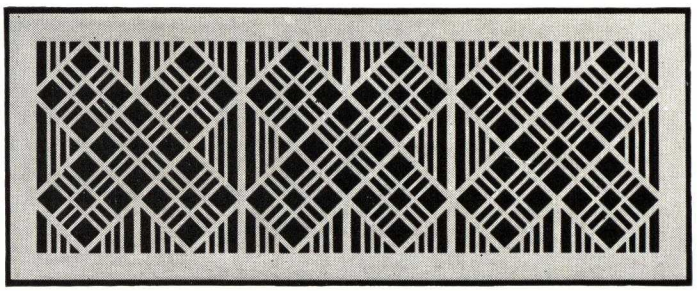
In addition to a complete range of standard designs, Hendrick can furnish grilles of many distinctive patterns, some of which are patented and exclusive with Hendrick. With a completely equipped tool room, a large stock of metals and every facility for the prompt production of special designs Hendrick solicits an opportunity to co-operate with architect, builder or engineer in the design and production of special grilles to harmonize with specific architectural designs.

Variety of Metals

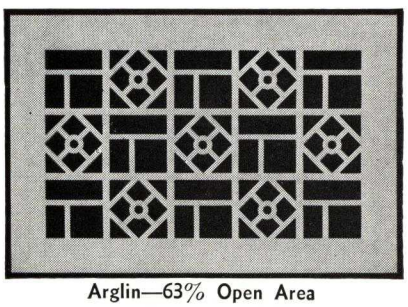
Hendrick Perforated Grilles, in a wide variety of patterns, are furnished in steel, aluminum, brass, bronze, copper, zinc, Monel, Everdur, stainless steels, and all other commercially rolled metals. They are supplied unpainted or with prime coat, with lacquer or duco finish of any specified color, with natural polish or with any standard electroplate finish.

The Handbook "Grilles"

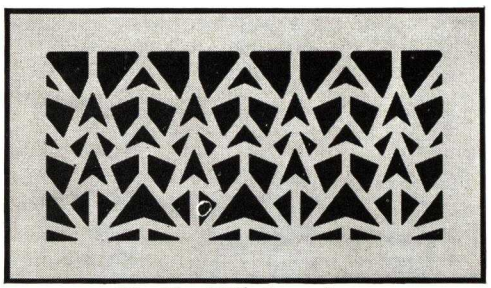
To architects, builders, engineers or others interested in grilles, Hendrick will gladly send a copy of an 80-page handbook containing useful data on perforated metal grilles. Among the illustrations are 80 different types of grilles, many of them distinctive with Hendrick. Included in the book are complete data on perforations, open areas, tables of weights of sheet metals and other data helpful to the man interested in grilles. Write for a copy today and file it for reference.



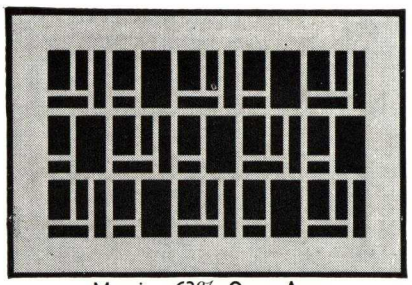
M No. 8—55% Open Area



Arglin—63% Open Area

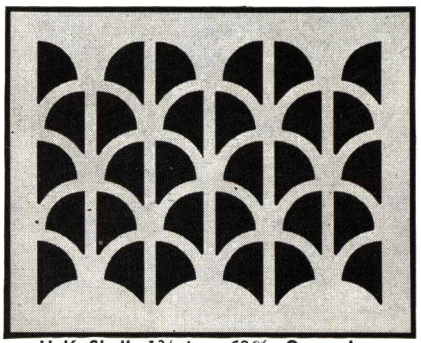


The Fir—54% Open Area

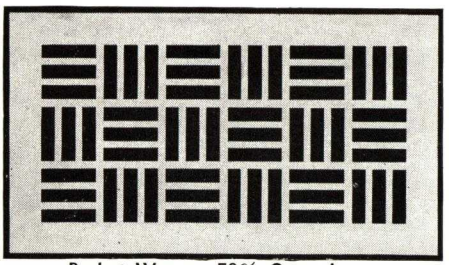


Mosaic—63% Open Area

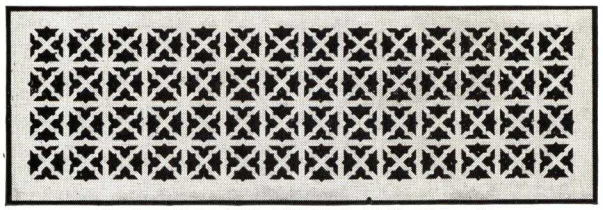
Chevrons—56% Open Area



Half Shell, 1¾-in.—60% Open Area

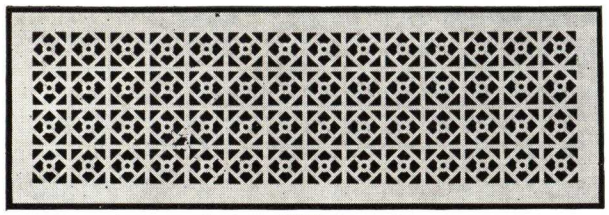


Basket Weave—58% Open Area

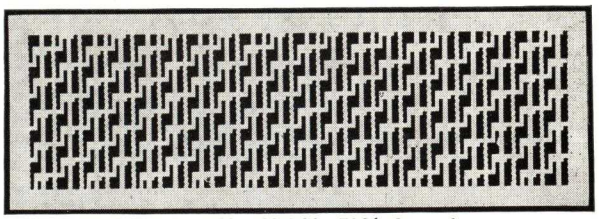


Design Patent No. 90,096—51% Open Area

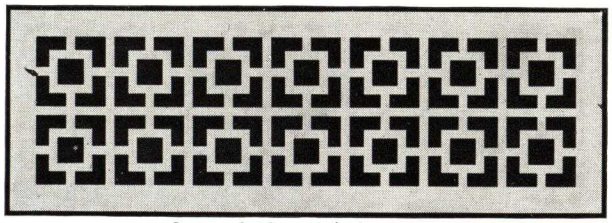
Design Patent No. 89,624—50% Open Area



Argive—60% Open Area

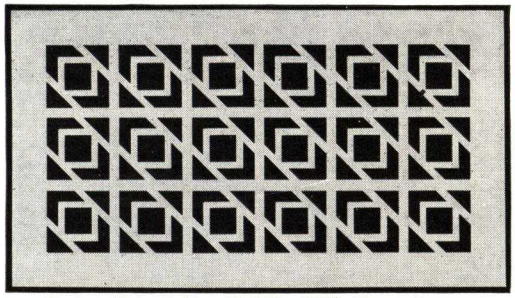


Design Patent No. 89,866—50% Open Area

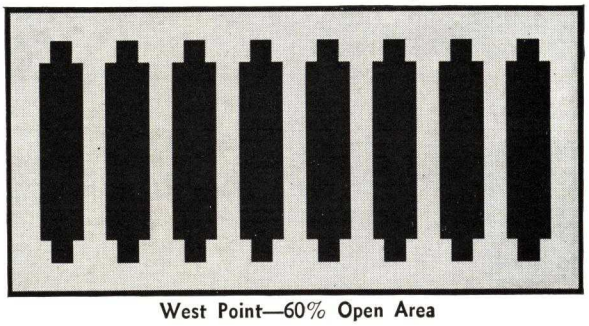


Square Link—56% Open Area

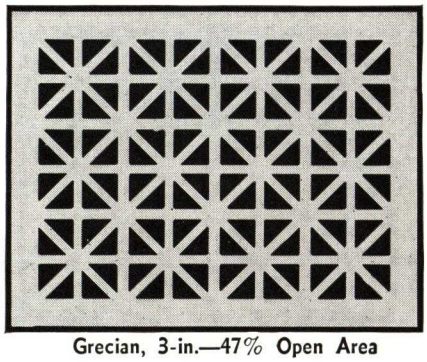
Design Patent No. 89,623—57% Open Area



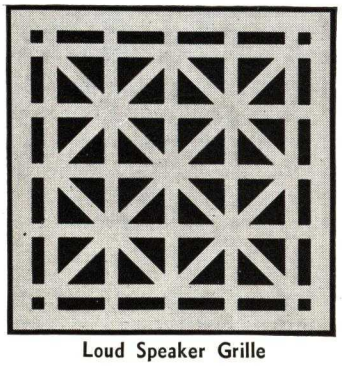
Design Patent No. 91,266—47% Open Area



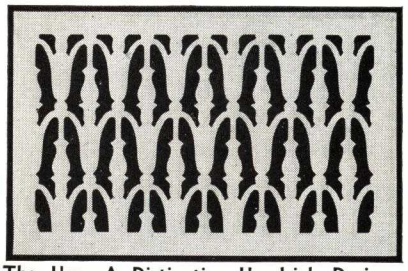
West Point—60% Open Area



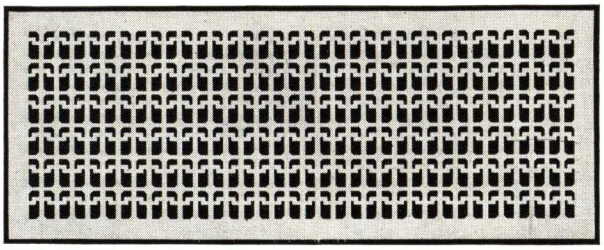
Grecian, 3-in.—47% Open Area



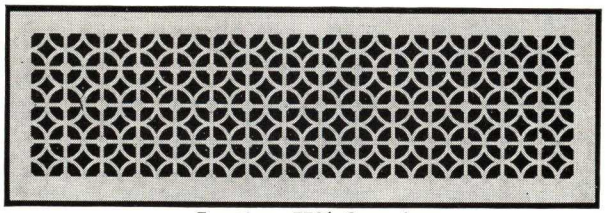
Loud Speaker Grille



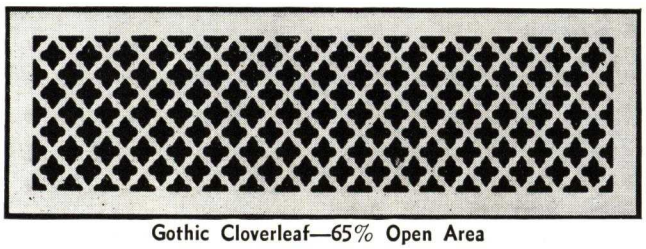
The Urn—A Distinctive Hendrick Design
47% Open Area



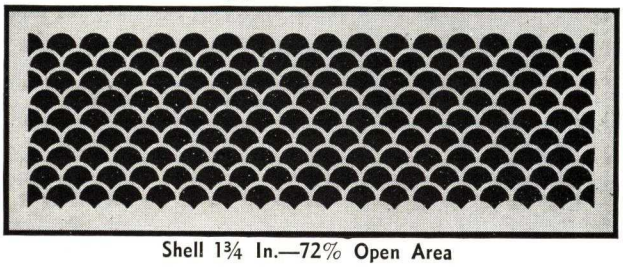
Design Patent No. 89,864—46% Open Area



Egyptian—55% Open Area



Gothic Cloverleaf—65% Open Area



Shell 1¾ In.—72% Open Area

Ordering Information

When inquiring about or ordering Hendrick Perforated Grilles, for prompt service, please state quantity; kind of material; thickness or gauge; over-all dimensions; width of blank border; design of perforation; doors or handholes, if any; location, size and style of attachment holes; desired finish. You will find the book "Grilles," helpful in specifying designs. Write for one.

HART & COOLEY MANUFACTURING CO.

ESTABLISHED 1901

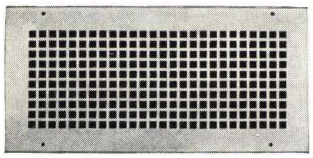
Air Conditioning Registers and Grilles—Warm Air Registers Damper Regulators—Furnace Regulators—Pulleys—Chain

ENGINEERING OFFICE AND FACTORY
HOLLAND, MICH.

CHICAGO OFFICE: 61 W. Kinzie Street

PHILADELPHIA OFFICE: 1600 Arch Street

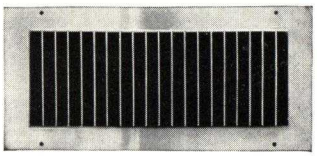
SEVEN COMPLETE LINES OF AIR CONDITIONING REGISTERS AND GRILLES IN FOUR DISTINCT PRICE GROUPS



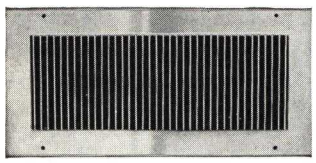
No. 71 Design—Perforated Plain Lattice

No. 71 Design—A low priced, attractive grille—easy to decorate. The ⅜-in. openings afford excellent concealment of duct—improve appearance. Price Group A.

No. 72 Design—Combines rigid bar type construction, neat appearance, maximum free area with low cost. Depth of bars is ⅜ in. Price Group A.

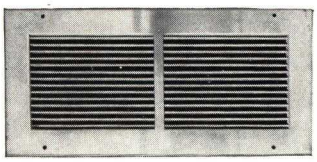


No. 72 Design—Non-adjustable Vertical Bar Open Mesh

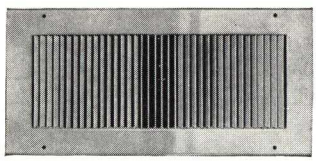


No. 77 Design—Non-adjustable Vertical Bar Close Mesh

Nos. 77 and 78 Designs—Made up of fixed bars ⅜ in. in depth and spaced ⅜ in. apart. These grilles and registers fulfill the demand for an inexpensive, yet attractive, register with straight air flow and effective duct concealment. The similarity in appearance to the Nos. 84 and 85 Designs also makes them adaptable for use as return air intakes with these designs. Price Group B.

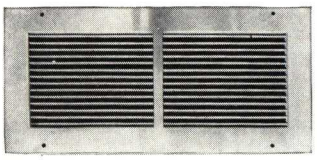


No. 78 Design—Non-adjustable Horizontal Bar Close Mesh

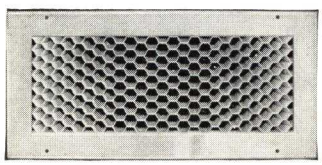


No. 84 Design—Adjustable Vertical Bar Close Mesh

Nos. 84 and 85 Designs—An adjustable deflection grille with bars ⅜ in. in depth and spaced ⅜ in. apart—bars are connected in 2-in. sections, allowing sectional adjustment. The unique construction assures positive directional control of air flow with quick adjustability to any combination of deflections desired. Depth of bars and close spacing combine attractive appearance and concealment of the duct. Price Group D.



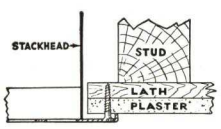
No. 85 Design—Adjustable Horizontal Bar Close Mesh



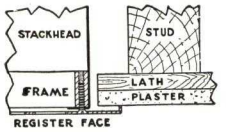
No. 90 Design—Dual Control Directional Flow

No. 90 Design—Made up of a number of thin strips, shaped into a series of grooves, which, when assembled form an attractive grille with openings ½ in. wide and 1 in. in depth. The tubes may be straight or curved to give any combination of directional flow desired. Construction provides dual control of air flow, both vertically and horizontally—air leaves in a horizontal plane regardless of approach. One inch depth and curved tubular openings conceal the duct and gradually change the path of the air stream with an absolute minimum of resistance and noise. Price Group E.

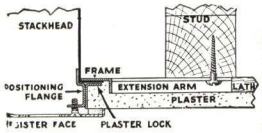
All of the designs described are available with or without valves, and are likewise available with any of the six types of frames described below.



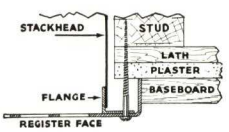
(1) Grille Only, Register Only, Return Air Intake, Flat — Without Installation Frame — Installed by screwing directly to wall, baseboard or wooden blocking. Margin has sufficient width to conceal opening and turned down edge provides space for gasket.



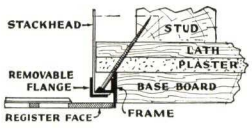
(2) Sidewall Register with Band Iron Frame—Frame is inserted inside of stackhead—fastened with straps or by bending stackhead over frame. May be nailed or screwed to blocking. Face is drawn up to frame with screws, assuring tight installation.



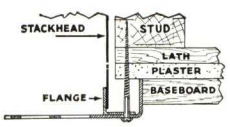
(3) Sidewall Register with Streakproof Frame — Frame and duct are embedded in plaster. Overlapping face with sponge rubber gasket, furnished as standard, insures a rigid and streakproof installation.



(4) Baseboard Register with Integral Frame and Face—Easy to install at minimum cost. Flange is inserted inside the stackhead and register is simply screwed to the wall.



(5) Baseboard Register with Streakproof Frame — Frame holds stackhead securely in place, eliminating streaking and preventing interference between valve and stackhead.



(6) Return Air Intake with ⅞-in. Projection—For use where intake extends above baseboard. Similar to baseboard register with integral frame, except without valve.

Complete Separate Catalogs on Air Conditioning Registers and Grilles or Warm Air Registers Available on Request

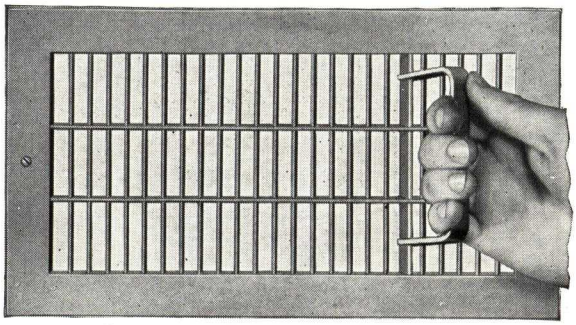
ESTABLISHED 1898

INDEPENDENT REGISTER CO.

3751 East 93d Street, CLEVELAND, OHIO

INDEPENDENT "FABRIKATED" ADJUSTABLE, DIRECTED AIR FLOW REGISTERS AND GRILLES

Reg. U. S. Pat. Off.



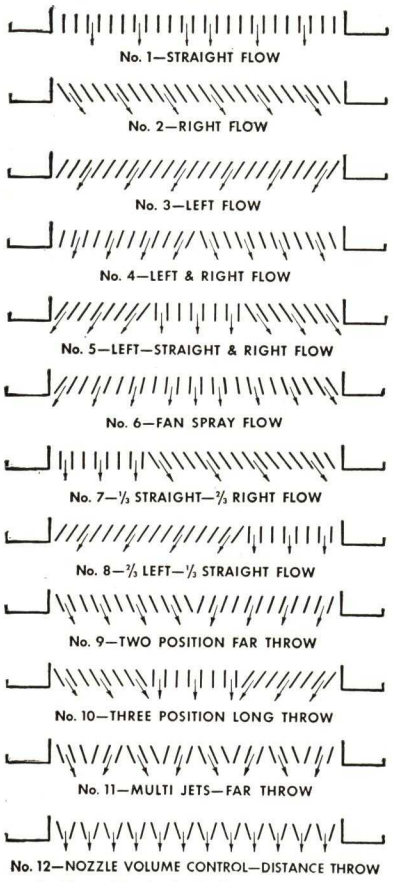
Each Grille Bar Is Adjusted Individually

Air flows can be deflected in any direction, distributed or concentrated, as shown in diagram, by adjusting grille bars with the special two-prong tool which accompanies every shipment. Adjusting can be done after the register or grille is in place without taking it down as the grille bars are held securely without locking. They remain tamper-proof, rattle-proof and vibration-proof.

Furnished either with vertical or horizontal grille bars.

They excel in strength, rigidity, appearance and wide range of deflections and combinations of deflections of air flows.

Face rim is made of cold rolled steel. Grille bars are 14-gauge, ½-in. cold rolled steel. Opening in face is ⅜-in. wide.



A Few Typical Grille Bar Settings Indicating the Wide Range Obtainable

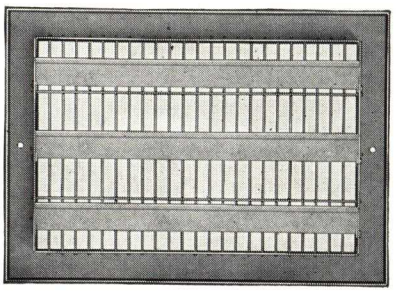
Sizes and Finishes

Furnished with or without either single or multiple valves. Standard sizes are 8x6 to 36x10 in. Other sizes can be made on special order.

Standard finishes are gray prime coat, black or white japanned, oak or lacquered finishes, electro-plated, oxidized copper, nickel, brass or bronze.

Deflecting Vanes in Back Give Four-Way Directional Air Flows

The most intricate and difficult problems in directing air flows can be solved by these registers and grilles. To the horizontal deflection of air flows, right, left or fanwise, imparted by the grille bars, the deflecting vanes in the back add an upward or downward deflection as desired. Each grille bar and each deflecting vane is adjusted individually, making possible the greatest variety of effects.

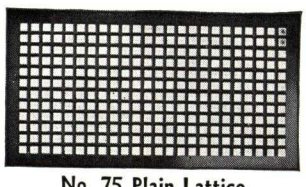


Made also with horizontal grille bars with vertical deflecting vanes in back.

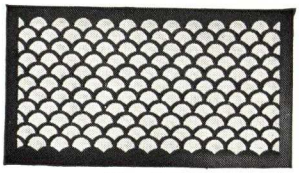
INDEPENDENT WROUGHT STEEL GRILLES

Also of brass, bronze, aluminum and other metals made to order to sizes as specified by our customers. Perforated from sheet metal, the thickness recommended for steel grilles being 12-gauge (approximately ⅛ in.) but 10-gauge (.140 in.) or 14-gauge (.078 in.) may also be used.

Enquiries and orders should include following information: Daylight opening size and over-all size, quantity and finish, material and gauge, design preferred. If screwholes are desired, their location and number and whether to be countersunk.



No. 75 Plain Lattice
The size most often used



No. 225S

No. 50—45% free area, ¾-in. multiples, ½-in. square opening, ¼-in. cross bars.

No. 75—57% free area, 1-in. multiples, ¾-in. square openings, ¼-in. cross bars.

No. 82—67% free area, 1-in. multiples, .82-in. square openings, .18-in. cross bars.

No. 875—61% free area, 1⅛-in. multiples, ⅞-in. square openings, ¼-in. cross bars.

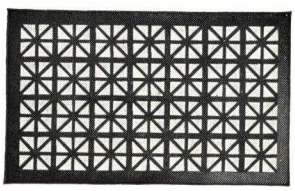
No. 100—64% free area, 1¼-in. multiples, 1-in. square openings, ¼-in. cross bars.

No. 225 S—67% free area openings; width, 2 in. center to center.
Height, 2¼ in. center to center.
Interior bars, ¼ in. wide.
Orders should specify which dimension is height.

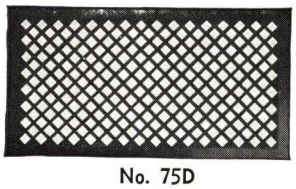
No. 3⅜G—3x3 in. openings. Bars between squares, ⅜ in. Each square 5 sq. in. free area.

No. 3½G—Same, except bars between squares, ½ in.

No. 75 D—57% free area (variable).
¾-in. diagonal square openings, ¼-in. cross bars, $\frac{33}{32}$-in. multiples.
Each opening, .5625 sq. in.



No. 3⅜G



No. 75D

The Independent line is so extensive that it can be shown only in small part. We issue two catalogues which will be sent on request

KNOWLES MUSHROOM VENTILATOR CO.

TELEPHONE
WAlker 5-5250

41 North Moore Street, NEW YORK, N. Y.

ESTABLISHED
IN 1906

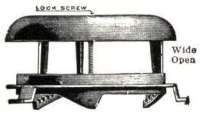
Products

CAST IRON and ALL-STEEL ADJUSTABLE MUSHROOM VENTILATORS; TU-WAY and AISLE HOOD AIR DEFLECTORS; ROUND and OBLONG GALLERY RISER VENTS.

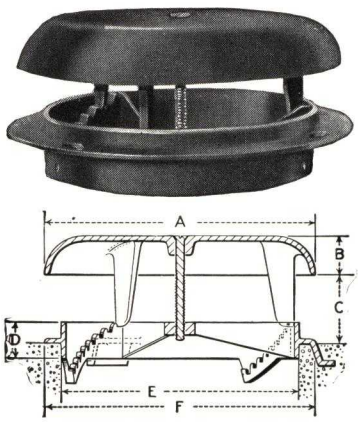
Uses and Operation of Air Controlling Heads

Used for controlling the supply of fresh air or the exhaust of vitiated air, particularly in the ventilation of auditoriums of theaters, schools, public buildings and large rooms of factories. Equally effective in up-draft or down-draft methods. Heads are usually located on the floor under the seats and connected with the plenum chamber or ducts. They are individually adjusted for their relative distance from the fan, so that each will distribute an equal quantity of air, or so that the distribution is regulated for different parts of the room.

Knowles Nu-Notch Mushroom Ventilator or Air Diffuser (Dome or Flat Top)



Cast L Lug Type



Cast L Lugs and Dirt Ring

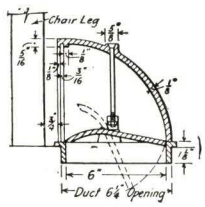
The ideal cast iron mushroom. Head has three outer bearings and is absolutely rigid. Ten recessed notches give close regulation of air. *Locked into positive adjustment by tightening head screw with a special key provided—a new feature to prevent tampering.* Supplied with dome or flat tops; three screw-holes in floor flange for wood floor, or three L lugs cast on flange for setting in concrete, or three threaded holes in floor collar for inserting set screws.

Size No.	A in.	B in.	C in.	D in.	E in.	F in.	Wgt., lb.	Area, sq. ft.	C.f.m. at velocity of 200 ft.	250 ft.	300 ft.	350 ft.	400 ft.
5	6	7/8	1 3/4	1 5/16	5 3/16	6	4	.1364	27.3	34.2	41.	47.7	54.6
6	7 1/8	1 1/8	1 1/2	1 1/2	6 3/16	7 1/8	4 3/4	.1964	39.3	49.1	59.	68.7	78.6
7	8 1/4	1 1/4	2 1/8	1 1/4	7 3/16	8 1/4	6 1/2	.2673	53.5	66.8	80.2	93.5	107.
8	9 5/8	1 1/2	2	2	8 3/16	10 1/8	9	.3491	69.8	87.3	105.	122.	140.
10	11 1/2	1 5/8	3	2 1/2	10 3/16	11 7/8	14 1/2	.5454	109.	136.3	163.6	191.	218.

Specifications—Furnish and install where indicated on drawings or as hereinafter specified [5-in.] [6-in.] [7-in.] [8-in.] [10-in.] [Dome Top] [Flat Top] Nu-Notch Cast Iron Mushroom Air Diffusers with recessed notches for the permanent adjustment of mushroom caps at any desired opening together with center key-locking screw feature as manufactured by KNOWLES MUSHROOM VENTILATOR CO., New York, N. Y.

Provide under each air diffuser one No. 20 galvanized iron sleeve to be set by the heating contractor in conjunction with the general contractor at the time the floor is laid. In concrete floors when sleeves are located on forms fill sleeves with sand before being grouted in to prevent their distortion.

For wood floors: attach the mushrooms to the floor by means of flat head screws. *For concrete or similar type floors:* by inserting 3 setscrews in the collar, or by embedding 3 L lugs in cement. (In your specification please indicate the desired diameter size, style of top and method of attachment.)



Standard Aisle Hood (Cast Iron)

Air Deflectors are used to throw the fresh air out into the aisles in one direction. A curved damper reduces friction loss. Large size, 8 ins. long, 6 ins. wide, 6 ins. high. Area .333 sq. ft. Small size, 8 ins. long, 4½ ins. wide, 4½ ins. high. Area .25 sq. ft.

Oblong Gallery Riser Ventilator (Cast Iron) Grilles

With regulating volume damper. In two sizes. (See Booklet.)

Size No.	Collar and Riser Opening Length, o.d., in.	Height, o.d., in.	Area, sq. ft.	C.f.m. at 300 ft. vel.
8	10 1/4	6 3/4	.35	105
6x12	12 3/8	6 3/8	.5	150

Knowles "Aerovalve"—The Improved Mushroom

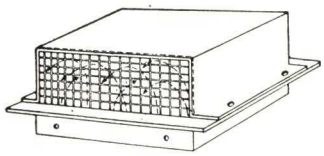
Knowles Heavy Steel "Aerovalve"

Easy to regulate and install. Low in price. A solid, heavy steel air unit of fixed height with cap supports bearing directly on flange. Parts cannot be separated either before or after installation. Quick, easy adjustment for finest control of air, by turning screw on top of cap. Rigid locking device prevents rattling. Quick anchorage to wood floors with screws through extended lugs on flange, and to concrete with special masonry nails furnished with mushroom. Furnished with or without adjustable air valve damper in 8-in. diameter size (only), same capacity as Nu-Notch type (see table).

Specifications—Furnish and install, where indicated on drawings or as hereinafter specified, 8-in. Steel Aerovalve Mushrooms [with] [without] adjustable Air Valve Damper.

Tu-Way Air Deflectors Deliver Full Area of Floor Opening (Cast Iron)

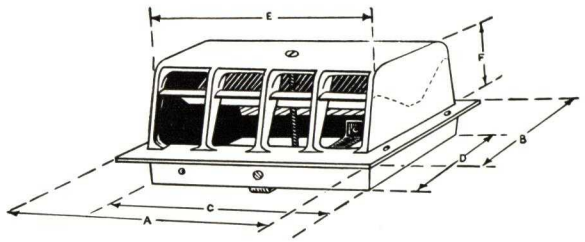
Designed to give maximum area with minimum fixed height. Air is discharged at both ends along the row of seats. Volume damper easily adjusted with screwdriver on top of hood.



Size No.	Dimensions, in. High	Wide	Long	Wt., lb.	Area, sq. ft.	C.f.m. at 300 ft. vel.
2	2 3/8	8 1/2	4 1/2	5	.223	67
4	4 3/8	8 1/2	8 1/2	11	.45	134
6	6 3/8	8 1/2	12 1/2	22	.67	200

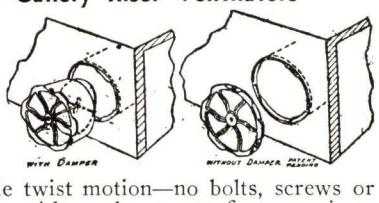
Improved No. 3 Size Tu-Way Air Deflector (Cast Iron)

The most popular size in this type deflector. Ornamental design. Adjustable double-wing curved damper deflects air downward. Fine, positive adjustment. Rattleproof; noiseless. Delivers or receives air to sides of chair.



Size No.	A. in.	B. in.	C. in.	D. in.	E. in.	F. in.	Wt., lb.	Area, sq. ft.	C.f.m. at 300 ft. vel.
3	10	8	8 1/2	6 1/2	8 1/4	3 1/2	10	.333	100

Knowles Disc-Loc Gallery Riser Ventilators



Designed to insure better control of air. Round holes in gallery risers do not weaken construction but, on the contrary, with the cast iron rings it is actually strengthened. Cast iron grille is quickly inserted and locked by simple twist motion—no bolts, screws or springs. Furnished with or without damper to fit same rings.

Size No.	Diameter of grille, inches Opening	Flange	Outside diameter of ring and contractor's sleeve, in.	Casting thickness, in.	Net area, sq. ft.	C.f.m. at 300 ft. vel.
14	3 3/4	5 1/8	4 3/4	1/8	.08	24
15	4 3/4	6 1/4	5 13/16	1/8	.13	39
16	5 3/4	7 3/8	6 7/8	1/8	.19	57
*17	6 5/8	7 7/8	7 13/16	1/8	.24	72

*Square mesh grille.

THE METALACE CORPORATION

60 K Street, SOUTH BOSTON, MASS.

METALACE WOVEN WIRE GRILLE

Woven by the Diagonal Strand Process

Uses—All kinds of grille work for heat transmission and decorative open paneling. Adaptability ranges from light-weight panels in radiator enclosures, and cabinets up to heavy ornamental grilles in large wall openings, bank caging, and guards.

Characteristics—The outstanding features of this remarkable grille are beauty, strength and convenience. Metalace is distinctive and blends in good taste with its surroundings. Its strands are rigidly interlocked. It can be supplied in heavy or light-weight meshes of ½, ¾, 1, 2, 2½ in. Free air area 40% to 80%. Weight ¾ to 2 lb. per sq. ft. There is a Metalace grille for every requirement.

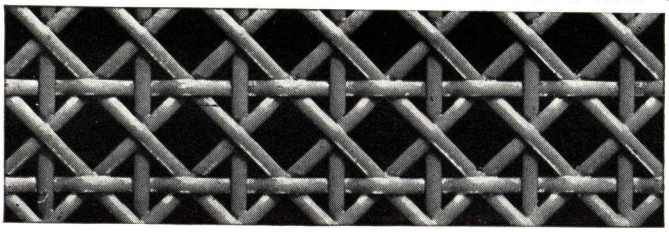
Installation—Usual methods suitable to metal framing. For wood construction staple and use moulding. Saves time and money, because it can be cut to size on the premises.

Material—Cold rolled steel, bronze, aluminum and copper (only in No. 53—the screen door guard). You can get startling effects by painting or plating.

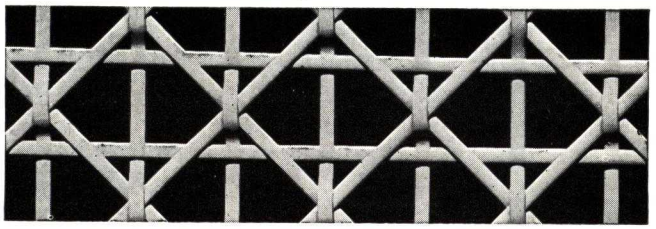
Distribution—Wire and grille dealers in principal cities stock Metalace. Furnished in rolls 3 and 6 ft. wide and 25 to 50 ft. long, or it can be cut to exact size.

Samples and Literature—May be secured on request. There are many other patterns than those shown here, particularly the heavy grilles and our famous No. 53 copper screen door guard made of .080 round wire in a pattern like No. 50.

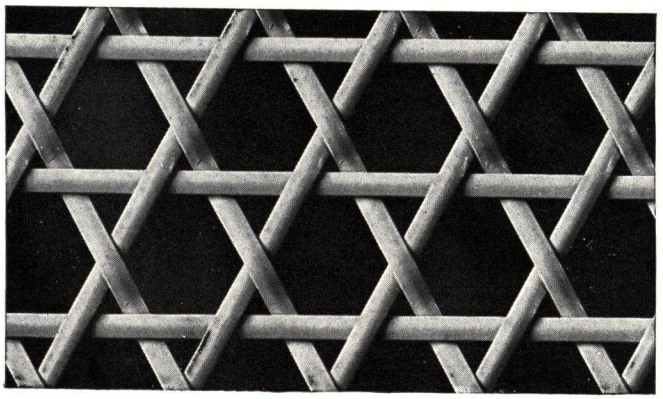
METALACE—LIGHT AND MEDIUM WEIGHT GRILLES



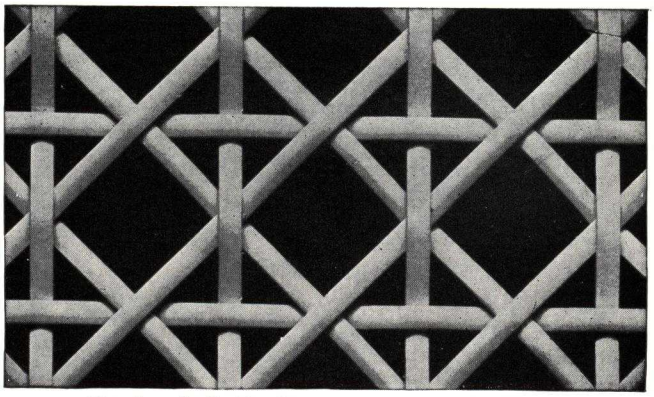
Metalace Grille No. 10 (Actual Size)—40% Open



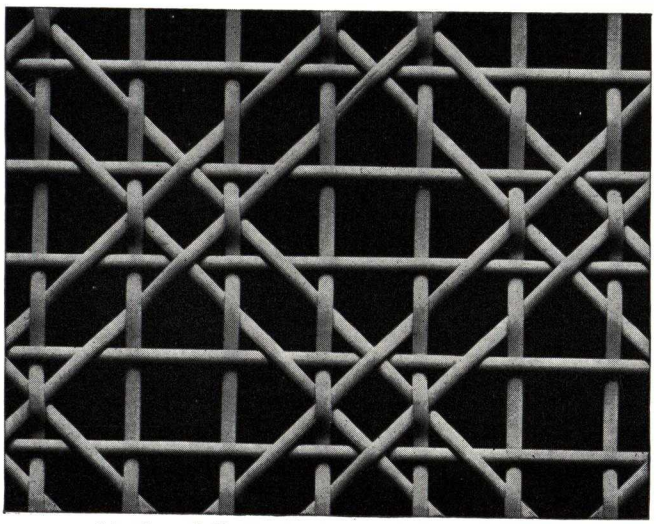
Metalace Grille No. 12 (Actual Size)—66% Open



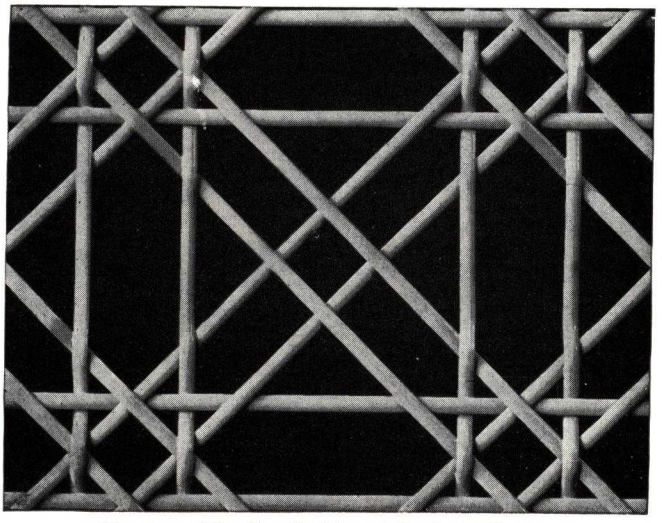
Metalace Grille No. 50 (Actual Size)—64% Open



Metalace Grille No. 70 (Actual Size)—60% Open



Metalace Grille No. 30 (Actual Size)—66% Open

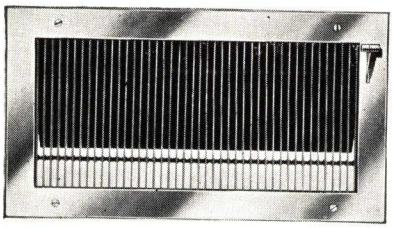


Metalace Grille No. 40 (Actual Size)—75% Open

TUTTLE & BAILEY, INCORPORATED

MAIN OFFICE AND FACTORY
NEW BRITAIN, CONN.
BRANCH OFFICES: BOSTON, MASS., NEW YORK, N. Y., CHICAGO, ILL. AND PHILADELPHIA, PA.

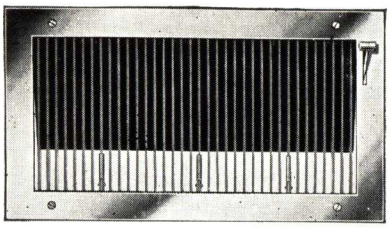
AIR CONDITIONING REGISTERS, GRILLES AND CONTROLS



Airline Register

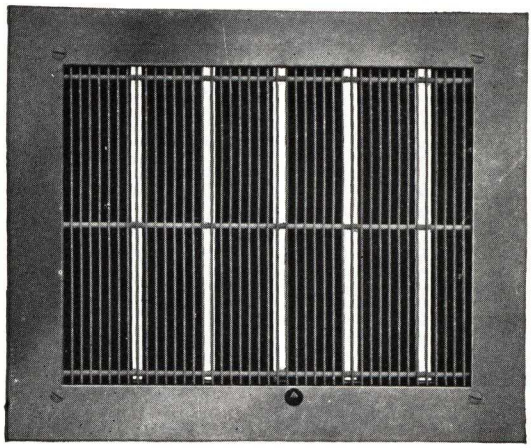
The standard air conditioning register. Close bar construction. Fixed air deflection. Sturdy and strong. Modern and attractive. Easily painted and cleaned. Very economical.

TRADE-MARK



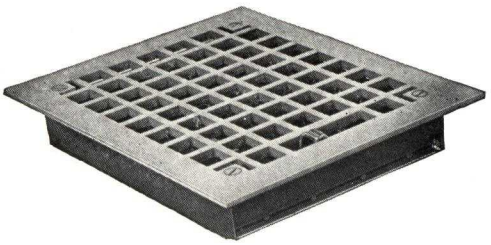
Flexair Register

Air deflection adjustable on the job. Modern and attractive. Very rigid. Easily painted and cleaned. Bars arranged either vertically or horizontally.



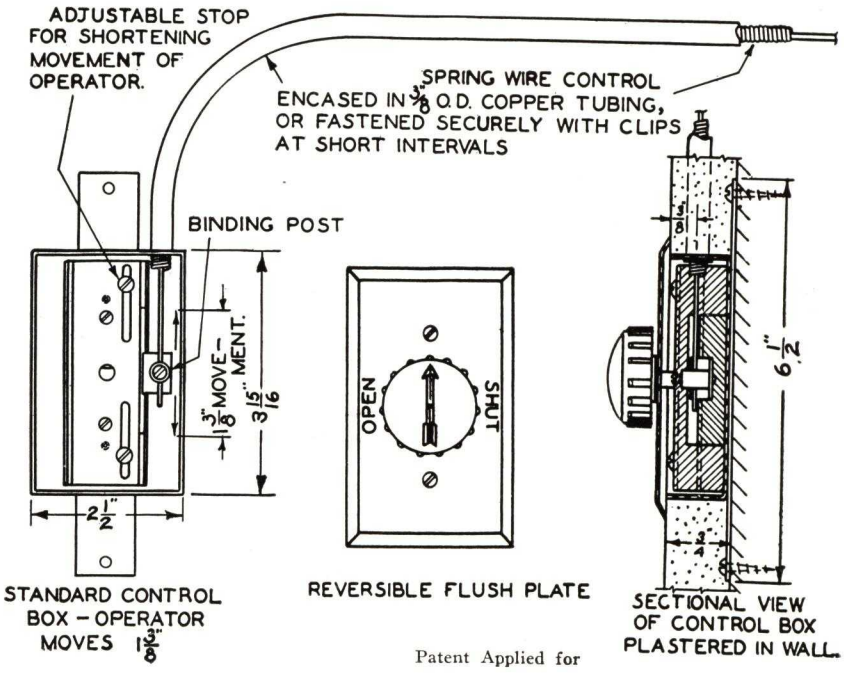
McKnight Volume Control Register

Provides positive control of air volume from the outlet. Constructed to allow expansion of air in a chamber immediately behind the face which minimizes jet velocities and the danger of whistling noises.

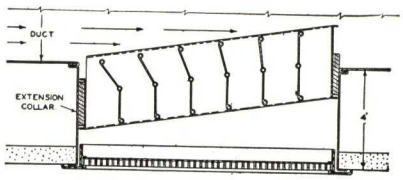


Semi Steel Register No. 230

Tuttle & Bailey manufacture a complete line of multi-valve registers for ventilating systems in both cast and wrought metals. All regular sizes in a great variety of constructions constantly in stock.



Patent Applied for



Tuttle & Bailey Santrols

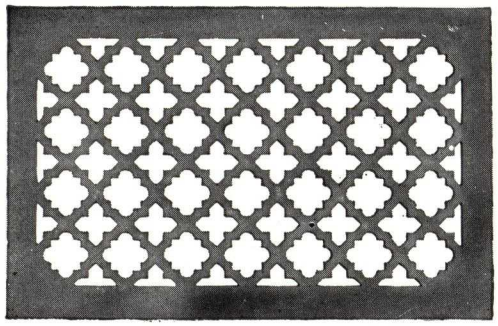
(Above)

An ingenious device that provides for absolutely uniform distribution of air over the entire face of an outlet and also allows for even distribution of air over an entire exterior duct system. Very inexpensive to install.

Remote Volume Control

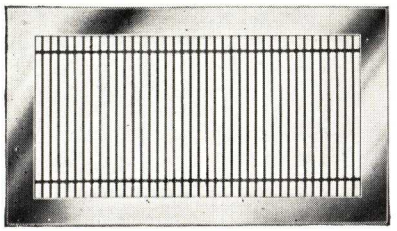
(At the left)

For hotels, apartment houses, office buildings and other public buildings where it is desirable to allow for individual adjustment of air volume to suit individual tastes. The only portion which shows is an escutcheon plate, no bigger than a light switch plate, which is placed in the wall at convenient height. Makes the control of air volume as easy as tuning in a radio.



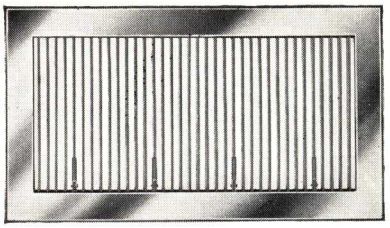
Stamped Design No. 582

Over 40 designs are available in stamped or wrought metals, and may be perforated in metal thicknesses varying from No. 16 gauge to ¼ in. thick.



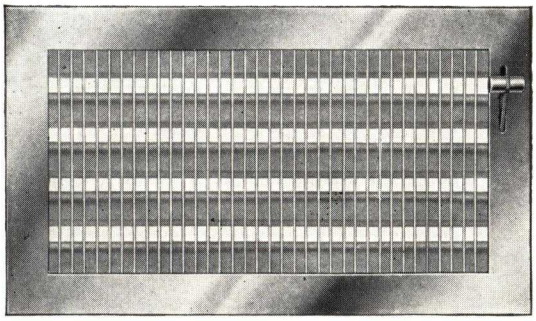
The Airline Grille

This grille is the standard of comparison. Close mesh, fixed air deflection. Vertical or horizontal bars. Strong, modern, economical.



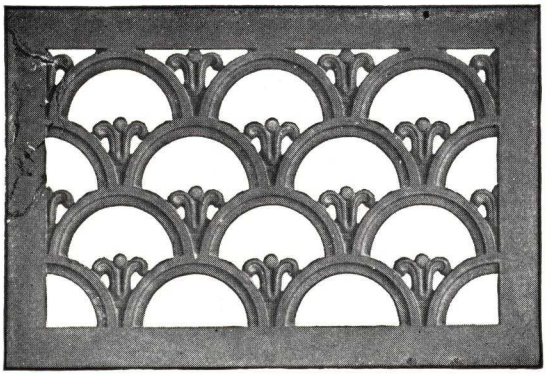
The Flexair Grille

Air deflection adjustable on the job. Close mesh. Vertical or horizontal bars. Sturdy, easily painted, modern.



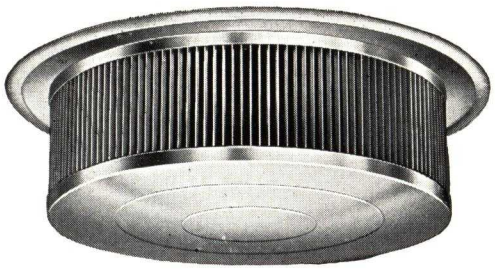
Multi-Shutter Register

Shutters are an integral part of frame and when completely open, the depth is only 2 in. Used in locations where the duct construction does not allow room for a single valve to operate.



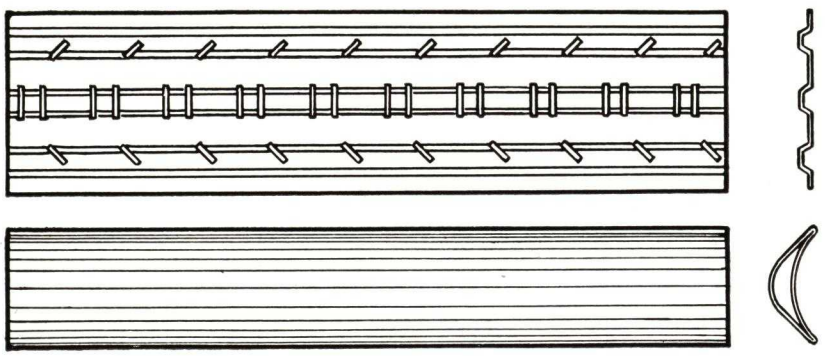
Cast Design No. 70

Over 300 designs are available in Tuttle & Bailey cast grilles or grilles may be cast in any design from architect's special details.



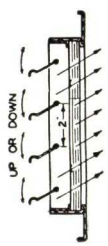
Ceiling Outlet

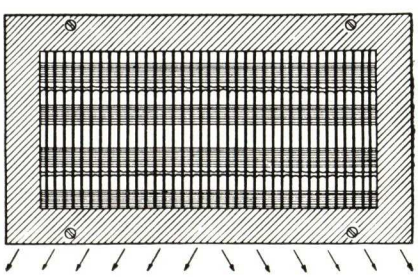
Tuttle & Bailey manufacture a number of types of ceiling outlets. This type of outlet is increasingly popular and it is very practical.



Tuttle & Bailey Ducturns

Ducturns are composed of scientifically designed turning blades for use in any air conditioning system to eliminate the necessity of long radius turns and allow the use of fabricated right angle turns throughout the whole system. Thus their use greatly simplifies the design of the system, represents a substantial economy, and provides a better looking finished job, as the duct work using right angle turns may easily be painted to match and resemble a part of the structure itself. Furnished assembled or unassembled for economy.





Combination Vertical and Horizontal Air Deflection

Tuttle & Bailey present a combination grille for vertical and horizontal air deflection from the same outlet. Ideal for use when the same outlet is to be used for both heating and cooling work. The most flexible outlet possible and a real "life saver" when conditions on the job change during course of construction. Immediately behind the face bars of the Flexair or Airline Grille, a series of individually operated shutters deflect the air vertically if the face bars are set for horizontal deflection, or horizontally if the face bars are set for vertical deflection.

Send for Latest Catalog. Contains hundreds of items not listed here.

MEMORANDA

UNITED STATES REGISTER CO.

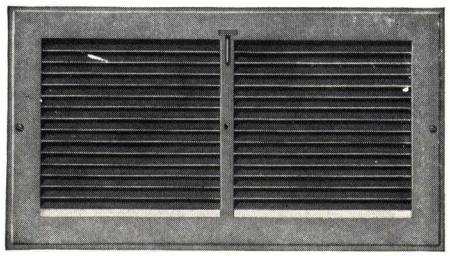
BATTLE CREEK, MICH.

MINNEAPOLIS, MINN. KANSAS CITY, MO. ALBANY, N. Y. SAN FRANCISCO, CAL. NEW YORK, N. Y.

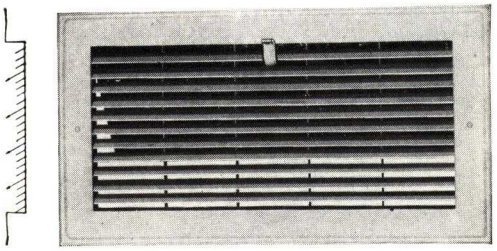
U. S. Air Conditioning Registers—Open and close-space, fixed and adjustable directional flow.

All lines of perforated Air Conditioning Registers are made of cold rolled steel. Directional Registers with fixed Directional-flow and Adjustable Air-flow are constructed to render perfect quiet air delivery.

Horizontal bar styles of U. S. Adjustable-Bar Registers can be adjusted to a 60° upward flow and to a 60° downward flow, especially produced for cooling installations and for combination summer cooling and winter heating air conditioning systems.



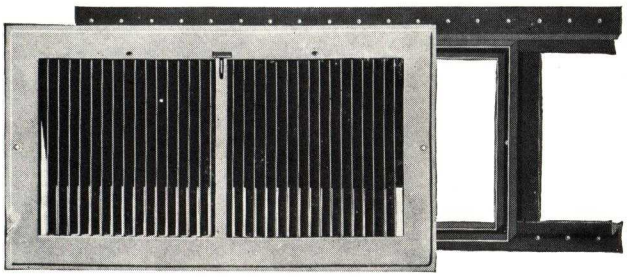
These illustrations cover only a portion of the U. S. Air Conditioning Register Lines. For latest detail and data of complete lines, sizes, etc., write for latest catalogs



Style 119-0—U. S. A-C Register. Interchangeable with all styles of frames. Open ⅜-in. spacing and in all fixed-flow styles. Shown is 22° down-flow horizontal bar style.

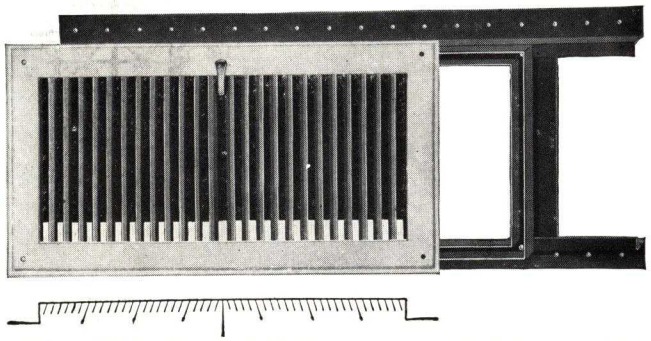
Horizontal Bar

Style No. 145—U. S. Adjustable-Bar A-C Registers. Furnished with band-steel, Seal-Pak and baseboard ⅞-in. frames. Adjusts to 60° up and down. Key pin adjustment preserves register finish.

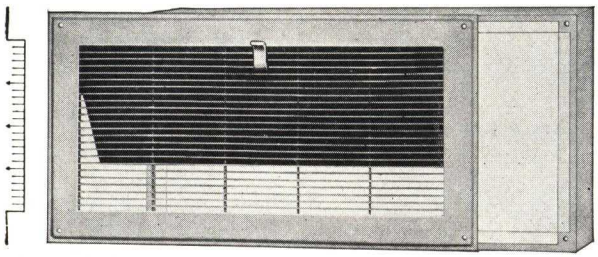


Vertical

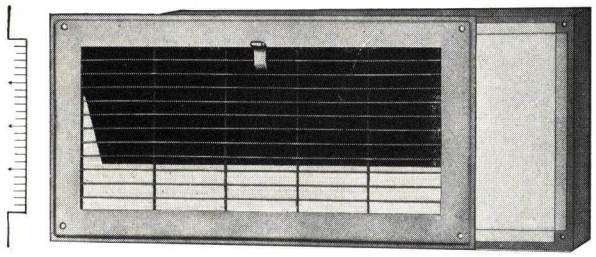
Style No. 150—U. S. Adjustable-Bar A-C Register illustrated with Seal-Pak stud frame interchangeable with all frames. Adjusts to right, left or multi-flow.



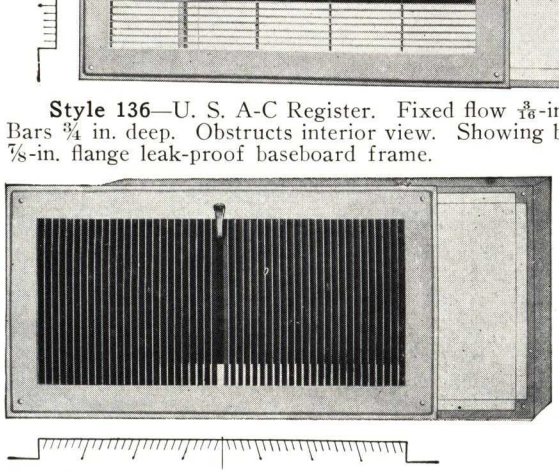
Style 128-0—U. S. A-C Register with Seal-Pak studding frame. Open ⅜-in. spacing. Vertical bar. Any fixed directional-flow.



Style 136—U. S. A-C Register. Fixed flow $\frac{3}{16}$-in. spacing. Bars ¾ in. deep. Obstructs interior view. Showing baseboard, ⅞-in. flange leak-proof baseboard frame.

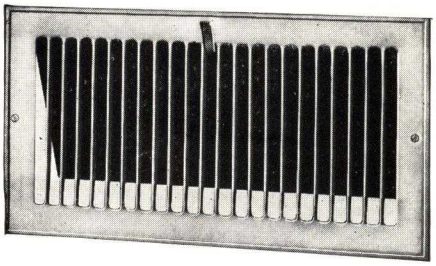


Style 136-0—U. S. A-C Register with ⅞-in. baseboard frame, showing leak-proof connection. ⅜-in. open spacing. Bars ¾ in. deep.



Style 138—U. S. A-C Register. Fixed flow $\frac{3}{16}$-in. spacing. Furnished in two, three, four, five way and multi-flow from straight to 22° and 45°. Interchangeable with any style of frame.

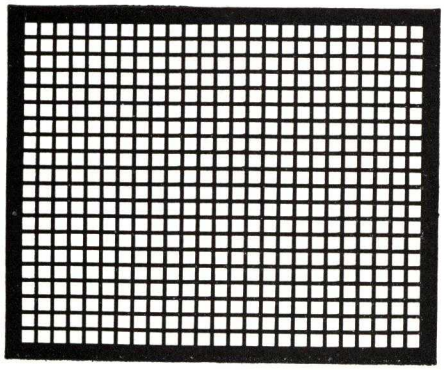
Complete Air Conditioning Register Catalogs cover every required class and size in the designs illustrated. Also flat and baseboard vent faces to match



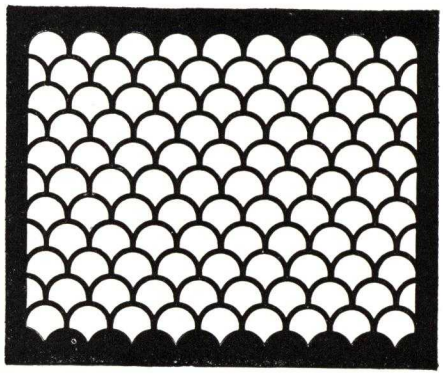
Style 102—U. S. A-C Register made of perforated embossed steel. Non-directional flow. Interchangeable with all style of frames.

A FEW STANDARD DESIGNS OF U. S. PERFORATED METAL GRILLES

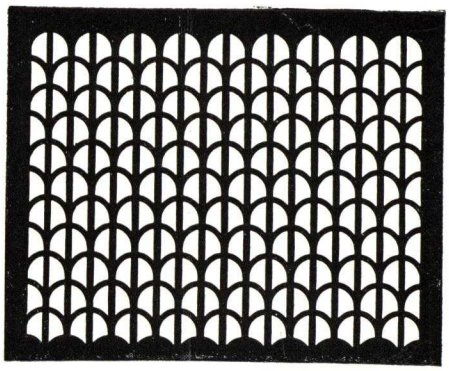
Made of sheet steel, brass, bronze, aluminum, stainless steel and other non-ferrous metals.
Finished in all baked enamel, lacquered and plated finishes to match any required finish.



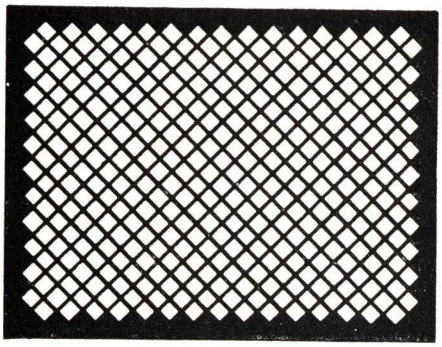
A: ⅞" Sq. Mesh ¼" Bars 61% Area
AA: 1⅛" Sq. Mesh 3/16" Bars 69% Area
B: ¾" Sq. Mesh ¼" Bars 57% Area
C: ½" Sq. Mesh 3/16" Bars 53% Area



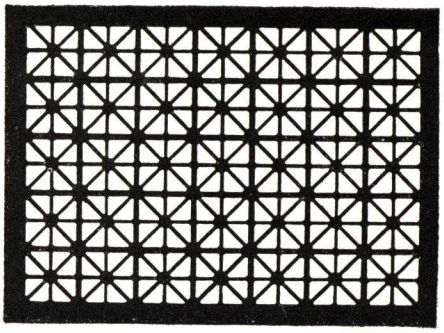
Style J: 2½" Wide, 2 5/16" High
Free Area 69%, ⅜" Bars



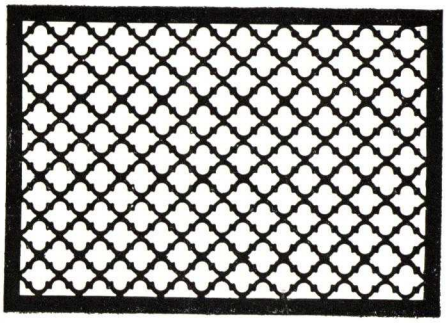
Style K: 2½" Wide, 2" High
Free Area 54%, ⅜" Bars



F: ⅞" Diagonal Mesh ¼" Bars 61% Area
FF: 1⅛" Diagonal Mesh 3/16" Bars 69% Area
G: ¾" Diagonal Mesh ¼" Bars 57% Area
H: ½" Diagonal Mesh 3/16" Bars 53% Area

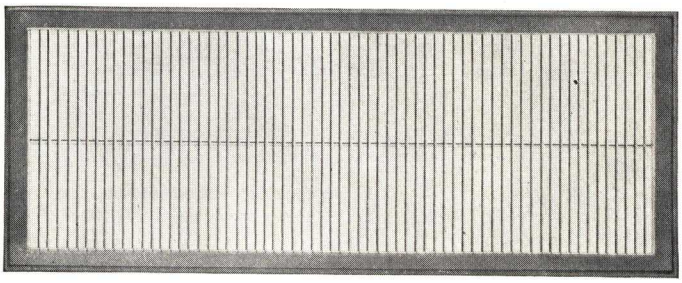


Style D: 3" Basic Square
47% Free Area
Style E: 3½" Basic Square
53% Free Area



Style Q: 1½"x1¾" Mesh
Free Area 72%
Unit Size 2" Wide, 2⅛" High

U. S. DIRECTIONAL-FLOW FIN-TYPE GRILLES: OPEN AND CLOSE SPACE



Horizontal—22° or 45° Down Flow

Style 220-0—Open space, ⅜-in. spacing.
Style 220 —Close space, 3/16-in. spacing.

Vertical

Style 222-0—Open space, 2-way flow, 22° or 45°.
Style 223-0—Open space, 3-way flow.
Style 224-0—Open space, 5-way flow.
Style 222—Close space, 2-way flow, 22° or 45°.
Style 223—Close space, 3-way flow.
Style 224—Close space, 5-way flow.

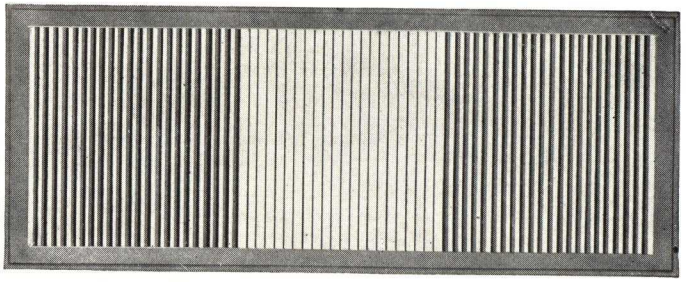
Vertical—Straight Flow

Style 221-0—Open space, ⅜-in. spacing.
Style 221 —Close space, 3/16-in. spacing.

If One-way Flow right or left is required specify direction and number, i.e. Style 221 Left Flow or Right Flow.

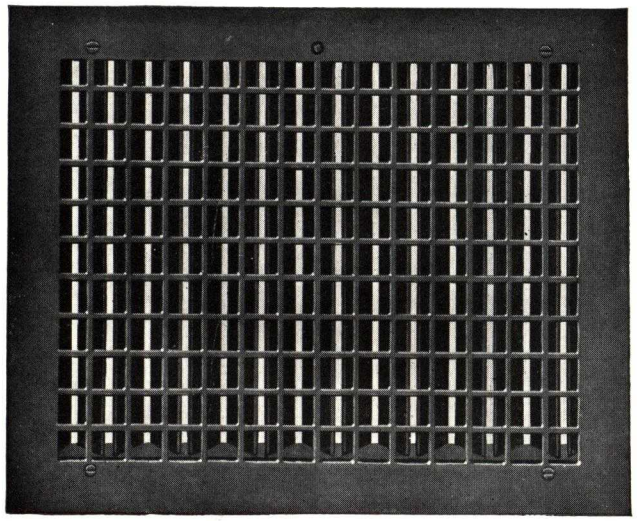
Horizontal—Straight Flow

Style 219-0—Open space, ⅜-in. spacing.
Style 219 —Close space, 3/16-in. spacing.



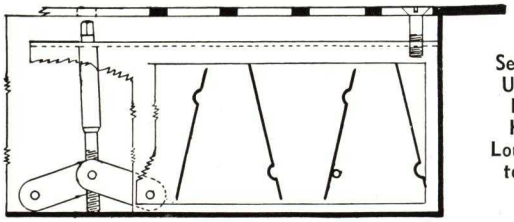
Any style on this page can be furnished on U. S. Governair Register, also on Hand and Key Operated Registers.

For complete information see latest General Register and Grille Catalog



U. S. GOVERNAIR REGISTER

A direct flow and air controlling key-operating register that is perfect and positive for air-conditioned heating and cooling systems requiring a measured air volume and straight flow. Tested by Mechanical Laboratories of the University of Michigan Engineering Department. Louvers operate in opposed position giving clear stream flow. Can be supplied with Truss-steel Open or Close Mesh Faces. Faces are made in $\frac{13}{16}$-in. square mesh—$\frac{3}{16}$-in. bars unless other perforated metal designs are required as shown on page 2. Can also be supplied without faces or with directional grille faces as shown at bottom of page 2.

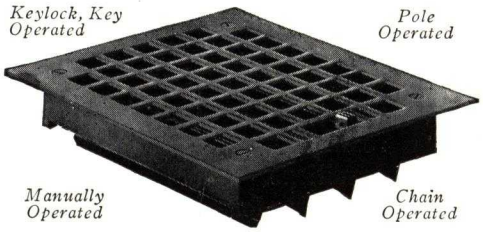


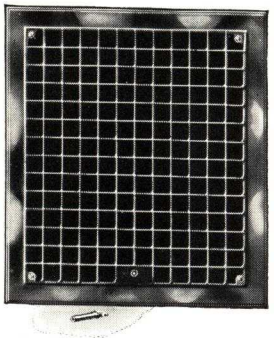
Section Showing U. S. Governair Register with Key Operated Louvers Adjusted to About Half Capacity

(Patented)

U. S. Sani-Steel Ventilating Register

Has all the appearance of an all-cast register but is stronger, neater and preferable in every way



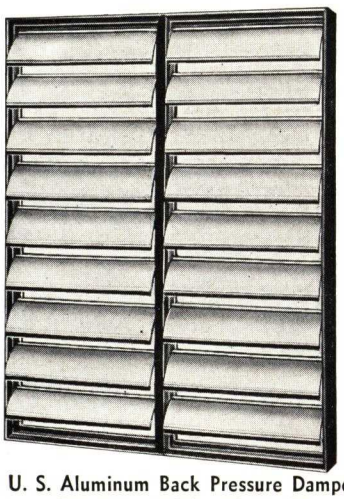


U. S. Steel Vent Register

Manually operated, keylock, key operated, pole operated and chain-pull operated

U. S. Trussteel Air-Conditioning Floor Register

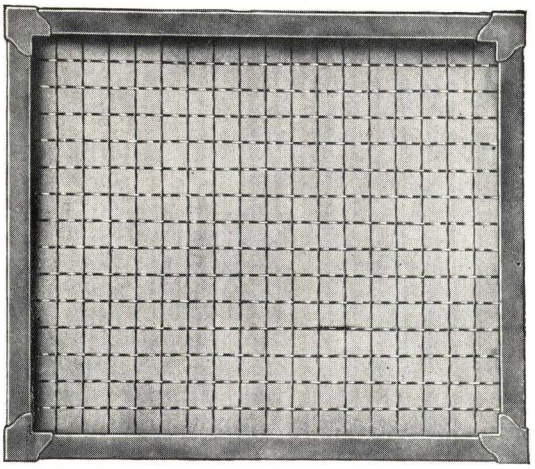
Close mesh, oblong design



U. S. Aluminum Back Pressure Damper

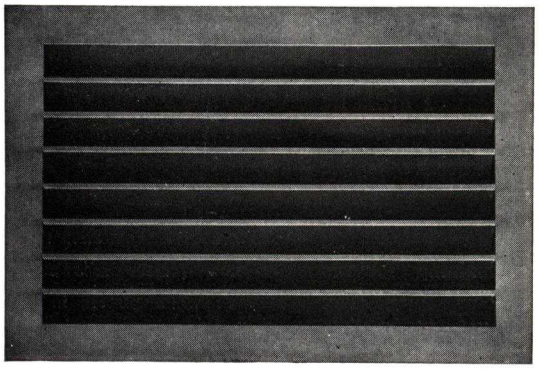
Designate width and height

U. S. Aluminum Louver Exhaust Fan Damper



U. S. Wire Screen, Design No. 62 Angle Frame, Square Mesh

U. S. Wire Screen Design No. 61 Angle Frame Diagonal Mesh. Can also be furnished with channel frame



U. S. OUTSIDE INTAKE VENTILATORS (MADE OF HEAVY GAUGE STEEL)

U. S. Outside Intake Ventilators are made of heavy gauge steel to withstand many years of exposure to the elements. They are adaptable as outside fresh air intakes for air-conditioning and ventilating systems.

The shutters are stationary and set at a fixed angle that admits fresh air entrance, but prevents rain and snow from entering.

Louvers are set in angle frame which may be furnished drilled for attaching to wall when so specified—otherwise they are furnished with frames not drilled.

Always designate height and width when specifying.

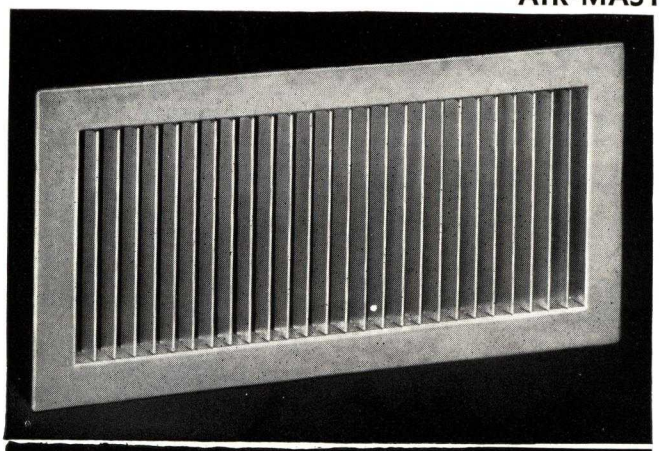
For complete information see latest General Register and Grille Catalog

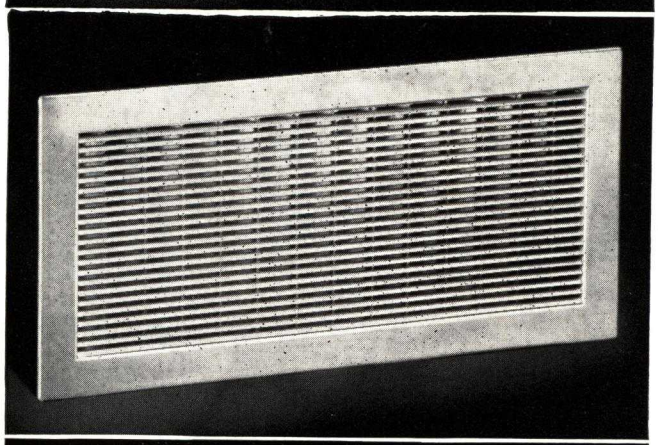
ESTABLISHED 1902

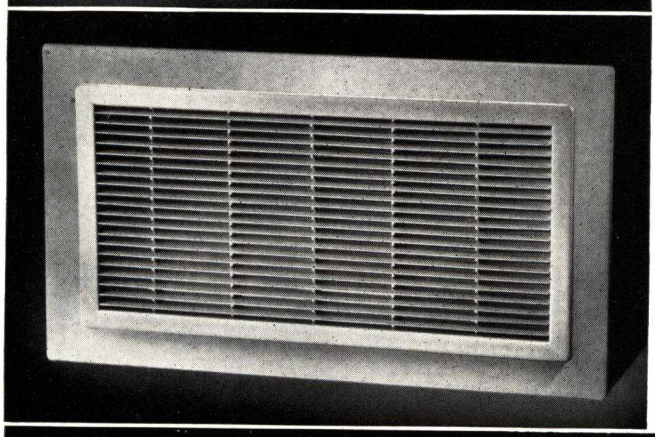
WATERLOO REGISTER COMPANY

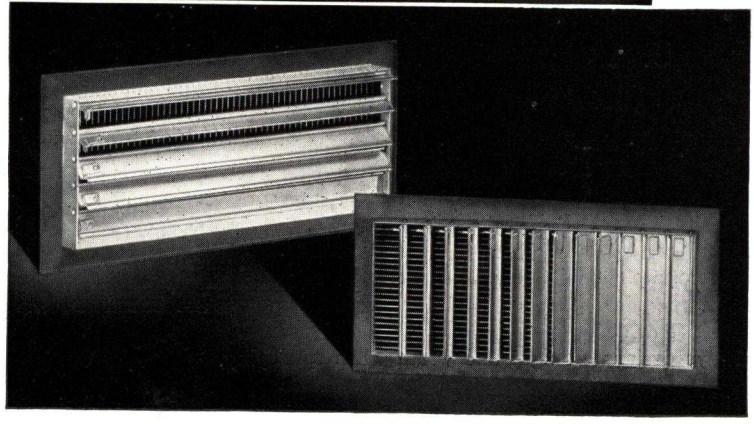
WATERLOO, IOWA SEATTLE, WASH.
NEW YORK, N. Y., Air Conditioning Utilities, Inc., 8 W. 40th St. LOS ANGELES, CAL., The California Waterloo Register Co., 824 Clanton St.

AIR-MASTER GRILLES



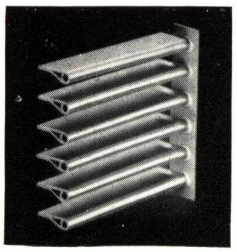






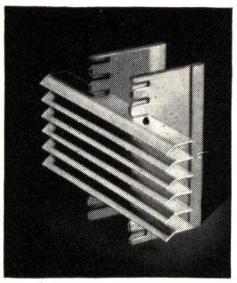
2A "Skyline" Grille

Streamline bars spaced on ½-in. centers are individually adjustable either way 60 degrees. Friction pivots maintain position of bars. Maximum efficiency and control are featured in this grille which permits long throw at straight setting—short throw at fan spread setting. Bars can be furnished parallel to short dimension (S-2A) or to long dimension (L-2A).



1A "Pilot" Grille

Thin, half hard cold rolled steel fins spaced at ¼-in. centers are semifabricated and supported by deep, individually operated adjustable rear deflectors. This provides a solid exterior with fixed directional flow plus the adjustability of the rear louvres in meeting unforseen conditions. Exterior fins may be parallel to long dimension (L-1A) or to short dimension (S-1A). This grille cannot be supplied with integral damper.



1P "Co-Pilot" Grille

Permanently fixed directional fins only, spaced on ¼-in. centers, without adjustable rear deflectors. May be used as supply grille but due to lack of adjustability, is recommended as a return grille.

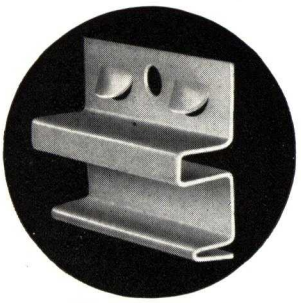
Spring Snap Mounting Frame

Spring Snap Mounting Frame, as illustrated at left, features attachment of grille with screws not visible. It can be supplied with any Waterloo-Airmaster grille and is intended especially for tile, marble and composition walls.

Duo-Trol Damper

Volume Control—Louvres placed in rear of grille structure may be individually operated from front of grille by special tool. They may be closed separately reducing effective grille size 1 in. as each louvre is shut.

Direction Control—The remaining louvres not closed will turn either way 45 degrees and may act as deflectors.



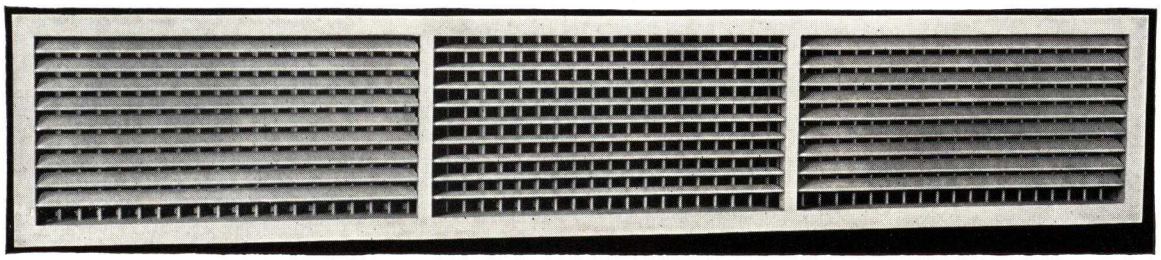
VU Plaster Frame

(Patented). Illustration shows section of special frame designed for new plaster installations. Small formed angle holds edge of duct while plaster is protected from temperature changes by U-shaped channel. Assures solid, tight connection. Designed for ½-in. plaster thickness

Write for Catalog No. 17.

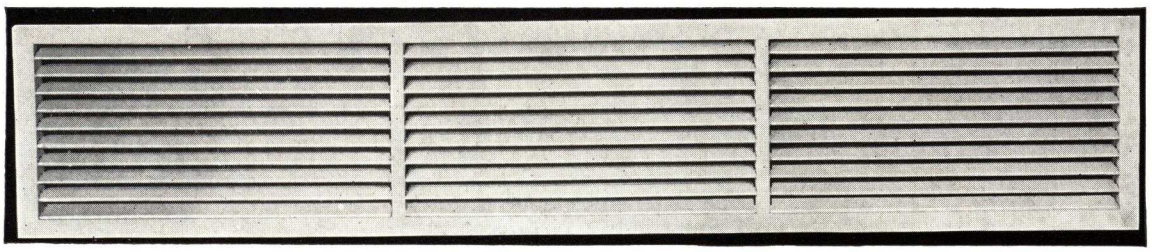
LOUVRE-TYPE GRILLES AND REGISTERS

Steel Floor Registers—Cold Air Faces



FHG-70

Incorporates two sets of individually adjustable louvres providing control upward, downward, right and left. 1-in. spacings. No integral damper can be attached. Depth 2 in.

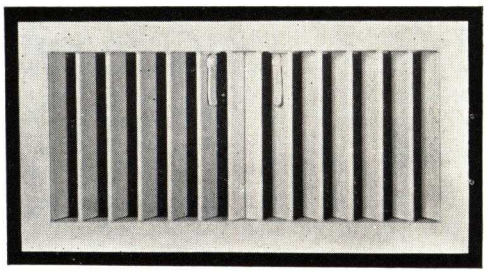


FHG-0-45

Return or exhaust grille with fixed louvres slanting at 45 degrees. Modern and attractive in appearance. 60% free area. 1-in. spacings. Depth ¾ in.

Commercial Louvre-Type Grilles

Louvres spaced 1 in. apart. May be keyed together to operate in series, or arranged to turn separately on friction pivots. Made from 24-gauge or 22-gauge cold rolled steel. Frames of 17-gauge cold rolled steel. Orders should specify size of opening. Refer to Catalog No. 17-A.

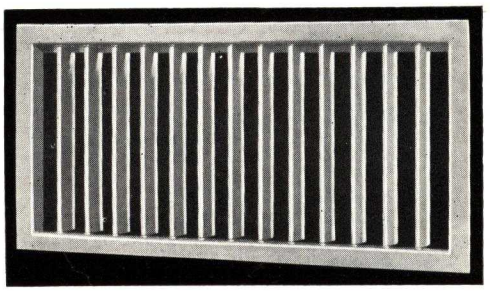


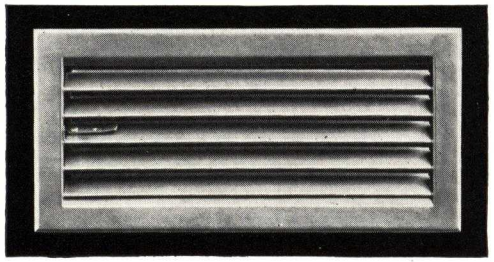
F-510

Twin sets of louvres provide right and left deflection. Easily cleaned when closed. Furnished as a wall register with VU plaster frame, or as baseboard register (F-514) with ⅞-in. projecting frame

FO

Straight louvres fixed permanently in frame with ⅝-in. straight edge border provide return air intake to match F-510 register. 80% free area



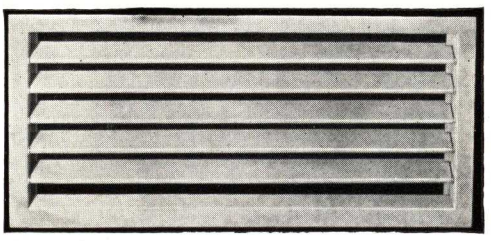


FH-100

Single set of louvres parallel with long dimension usually placed horizontally. Direction control through 90 degrees. Inverting register gives opposite direction. Trim, neat, efficient

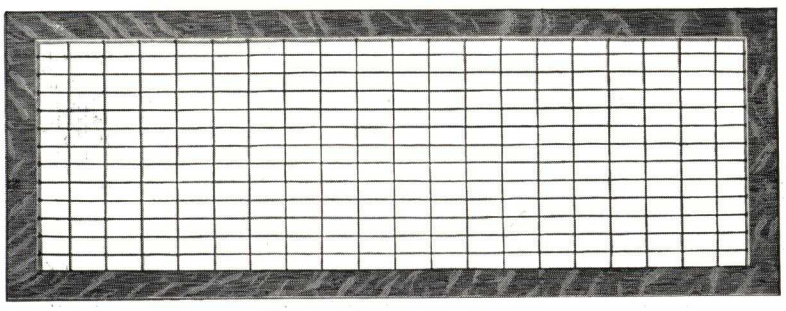
FH-0-45

Louvres fixed permanently at 45 degree angle in ⅝-in. border for return air intake to match FH-100. 60% free area. Also can be furnished with louvres at 20-degree angle (FH-0-20) and free area 75%



Residential Louvre-Type Registers

Catalog No. 17-A illustrates many other types of louvre designs for residential registers. Modern in appearance, louvre-type registers are also more sanitary, easily cleaned, and provide both directional and volume control features.



Standard Mesh Cold Air Floor Face

Oblong mesh design of steel bars permits more than 80% free area. Strong. Rugged. Black, gray prime, oak and electro-plated finishes are available

Standard Mesh Floor Register

Matches cold air floor face in appearance, but furnished with louvre box attached by screws at side. Can be obtained in same finishes as cold air floor faces illustrated at left

WICKWIRE SPENCER STEEL COMPANY

GENERAL OFFICES
41 East Forty-second Street
NEW YORK, N. Y.

DISTRICT OFFICES AND WAREHOUSES
WORCESTER NEW YORK BUFFALO CHICAGO SAN FRANCISCO LOS ANGELES

WICKWIRE SPENCER SALES CORPORATION

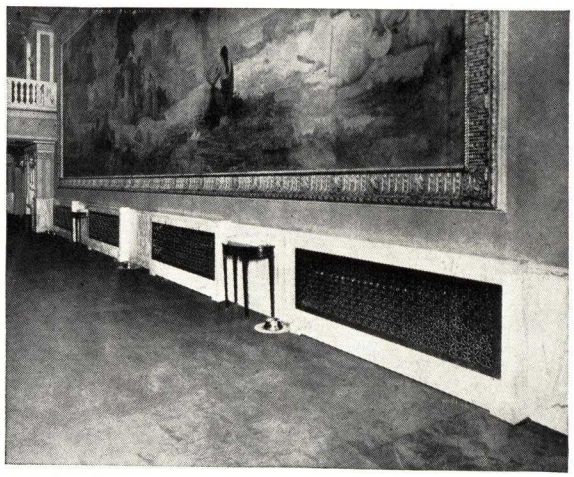
DISTRICT OFFICES AND WAREHOUSES
NEW YORK CHATTANOOGA TULSA PORTLAND SEATTLE

For Other Wickwire Spencer Products including Radiator Enclosures, see File Index

CLINTON METAL GRILLES IN STANDARD OR SPECIAL DESIGNS

IN BRASS, BRONZES, ALUMINUM, MONEL METAL OR STEEL

The Clinton Works of the WICKWIRE SPENCER STEEL COMPANY was the first plant in America to perforate grilles—over fifty years ago. We maintain dies enabling us to produce grilles of all standard and many unusual designs. Our heavy and modern equipment provides for fabricating metals into grilles as heavy as $\frac{5}{16}$ in. in thickness. Grilles of curved shapes and grilles made in accordance with your own designs and specifications can also be supplied.

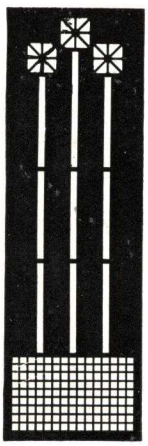


We have our own finishing plant for electroplating and can match any special finish desired. Invisible doors, hinged grilles, angle frame mountings, and many other specialties are within the scope of our manufacture.

We carry in our warehouse at all times a large tonnage of various gauges of sheet bronzes, aluminum, steels and other metals. This large stock of material enables us to render most efficient and quick service.

Materials

We recommend for consideration "Wissco" Bronze, an alloy. It has high tensile strength and can be finished in any manner to harmonize with the surroundings.



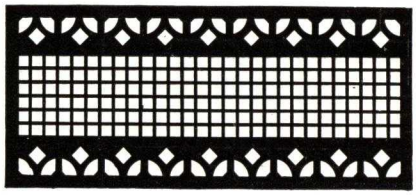
Design No. 113

"Wissco" Bronze compares favorably in price with electroplated steel, but for durability, it equals Commercial or Naval bronze.

Clinton Grilles are also furnished in other metals — stainless and regular steels, brass, copper, bronze, nickel, zinc, aluminum, monel, etc.

Finish

Grilles may be electroplated, japanned, painted, buffed or we can duplicate any finish upon receipt of sample. When grilles are to be finished with paint, we recommend that they be shipped with shop coat only and that the finishing coat be applied on the job.



Design No. 134

Dimensions and Shapes

Grilles can be made in any size or shape up to 60x156 in. in one piece. Larger sizes are made in two or more pieces carefully joined together with suitable butt straps, so that the joint is virtually invisible from the front.

Thickness

It is well to bear in mind that perforated metal grilles are stronger than cast grilles and a much thinner metal can be used. We perforate the various designs in steel in gauges ranging from ¼ in. to 16 U. S. gauge and in bronzes and aluminum $\frac{5}{16}$ in. to 16 B&S gauge.

Designs

Forty-five different designs are procurable from standard dies and any new designs required may be made to order. The Clinton Grille Handbook, the most complete of its kind, gives a detailed analysis of grille layouts and is invaluable to the architect.

Special Features

Angle frames, screwholes (plain or countersunk), invisible doors, handholes or any other special features can be supplied exactly according to your specifications.

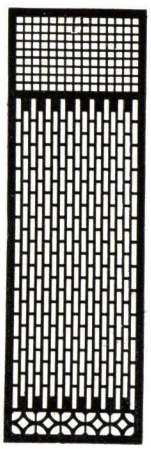
Specifications

When specifying please give all the following information.

Quantity. Style of perforation.
Gauge of material. Kind of metal.
Width of blank margins, and whether included in dimension specified.

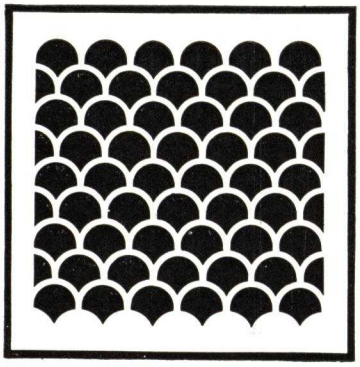
Screwholes or other special features. Finish.

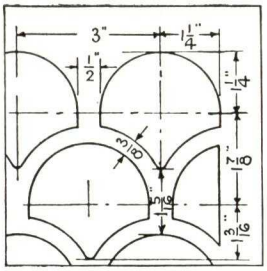
In other than lattice grilles and similar symmetrical designs, be careful to indicate which dimension is the vertical height of each grille when installed.



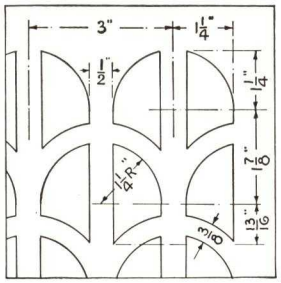
Design No. 119

The Grilles illustrated are Special Designs made from standard stampings

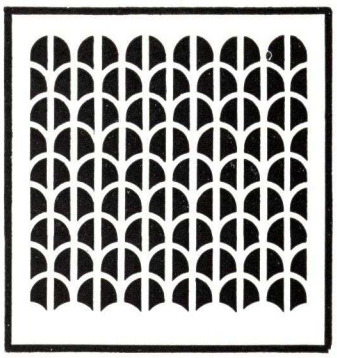


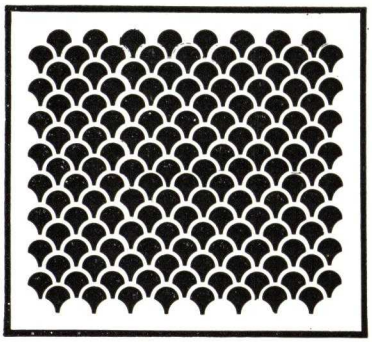


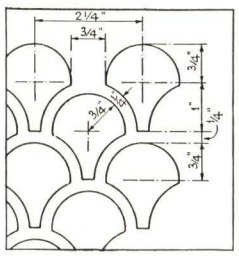
Design 117
Free air
opening 69%



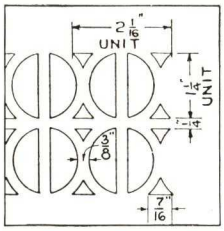
Design 121
Free air
opening 54%



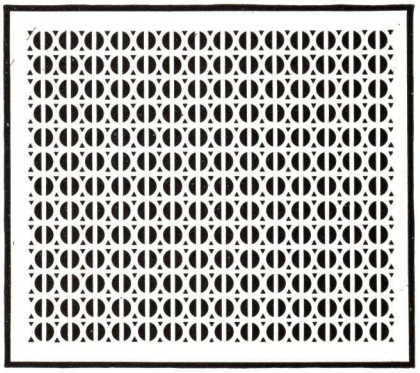


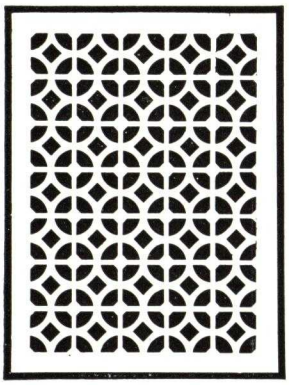


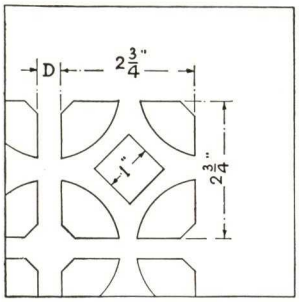
Design 1170
Free air
opening 65%



Design 705
Free air
opening 40.5%

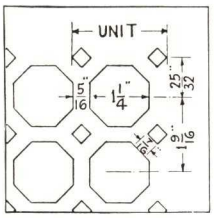




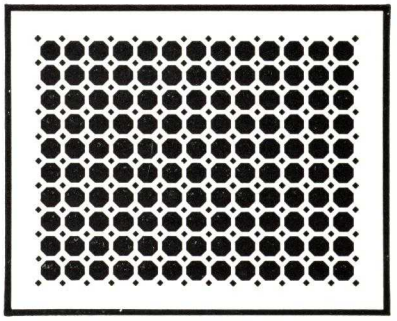


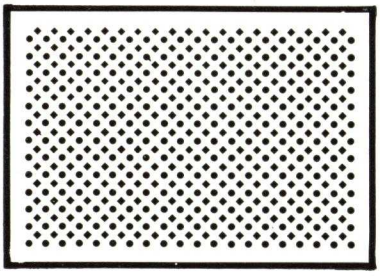
Design 122

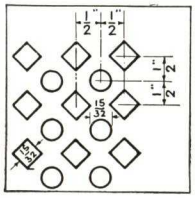
Bar "D"	Free air opening
⅜ in.	47 %
½ in.	43.4%
⅝ in.	40.3%



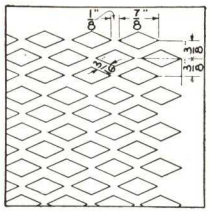
Design 505
Free air
opening 53%



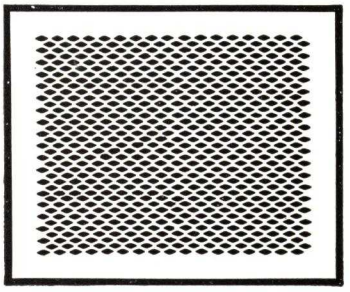


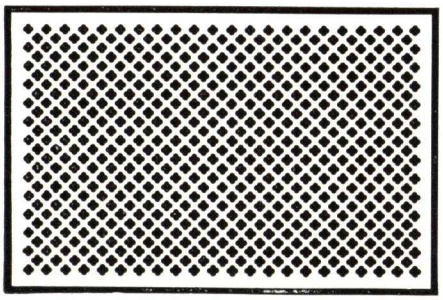


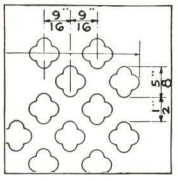
Design 103
Free air
opening 39.5%



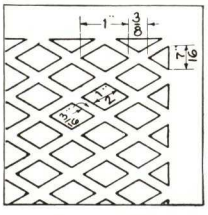
Design 109
Free air
opening 44%



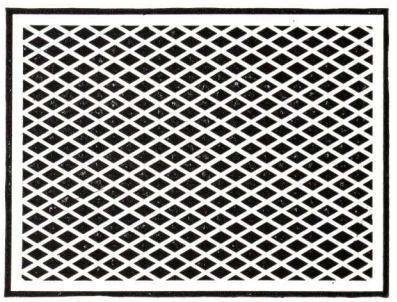




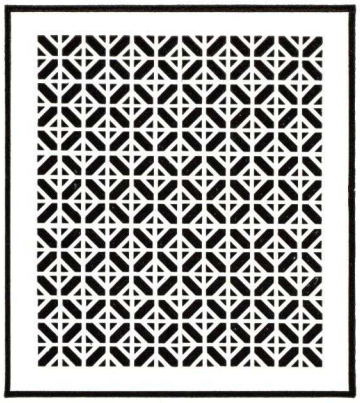
Design 104
Free air
opening 39%

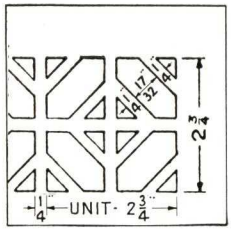


Design 140
Free air
opening 53%

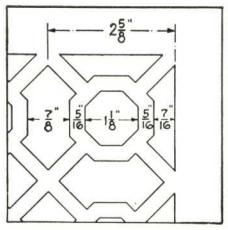


Note: Elevations shown at scale of 1 in. equals 1 ft. Details shown at scale of 3 in. equals 1 ft.

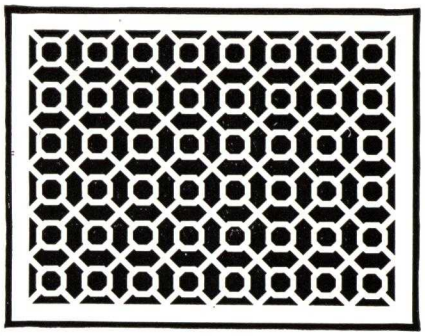


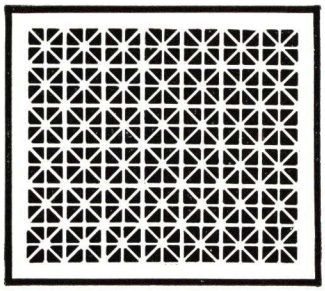


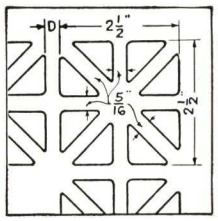
Design 605
Free air opening 47%



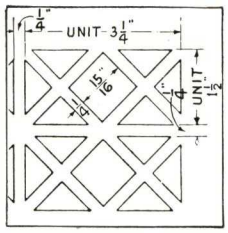
Design 805
Free air opening 60%



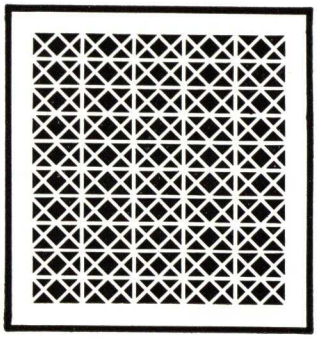




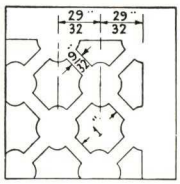
Designs 1051, 1052, 1053 and 1054



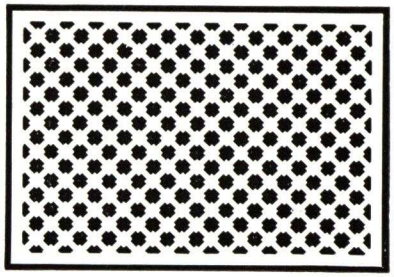
Design 405
Free air opening 48.5%

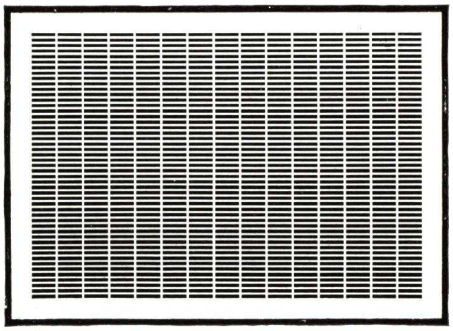


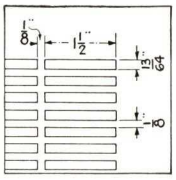
Design No.	Units	Bar "D"	Free air opening
1051	1¾ in.	3/16 in.	45 %
1052	2½ in.	3/16 in.	38.4%
1053	3 in.	3/16 in.	46.1%
1054	3½ in.	3/16 in.	52 %



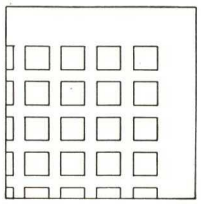
Design 137
Free air opening 48.5%



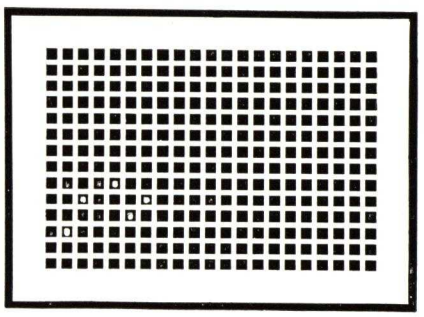


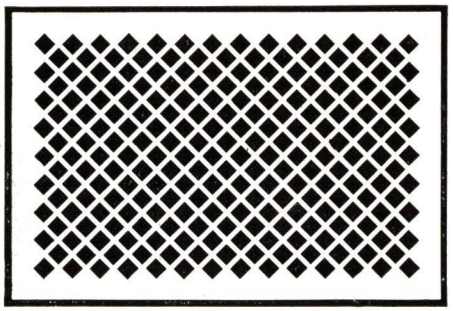


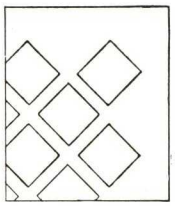
Design 92
Free air opening 56.6%



Designs 133, 133½, 134, 135, 135½ and 136







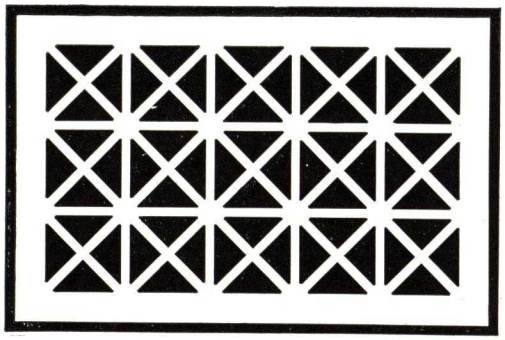
Designs 101, 101A and 123

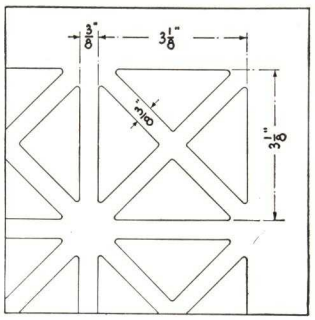
Design No.	Unit	Bar	Free air opening
101	½ in.	¼ in.	44.4%
101A	*½ in.	3/16 in.	54 %
123	1 in.	¼ in.	64 %

*½ unit in margin.

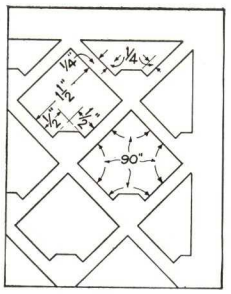
Design No.	Square perforations	Bar	Free air opening
141	¼ in.	⅛ in.	40%
142	3/8 in.	3/16 in.	35%
143	5/16 in.	⅛ or 3/16 in.	Variable
133	½ in.	3/16 or ¼ in.	53% or 45%
133½	5/8 in.	¼ in.	51%
134	¾ in.	¼ in.	56.3%
135	⅞ in.	3/16 or ¼ in.	68% or 60.5%
135½	1 in.	3/16 or ¼ in.	58% or 64%
144	1⅛ in.	⅜ in.	56%
145	1¼ in.	Any	Variable
136	1⅜ in.	⅜ in.	61.7%
146	1½ in.	Any	Variable
147	1¾ in.	Any	Variable
148	2 in.	Any	Variable
149	2½ in.	Any	Variable

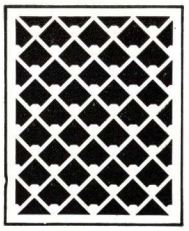
Note: Elevations shown at scale of 1 in. equals 1 ft. Details shown at scale of 3 in. equals 1 ft.



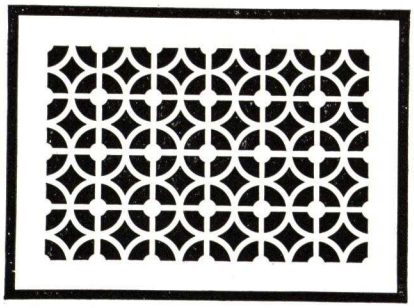


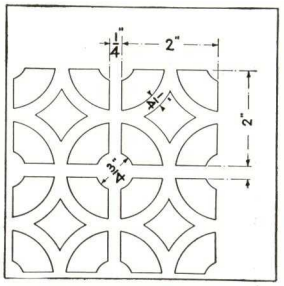
Design 825
Free air opening 70%



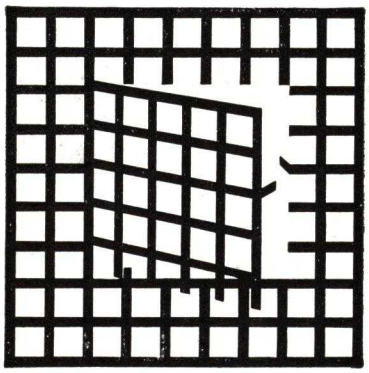


Design 850
Free air opening 66%

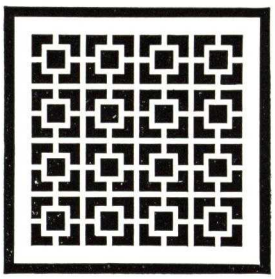


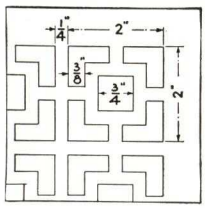


Design 815
Free air opening 50%



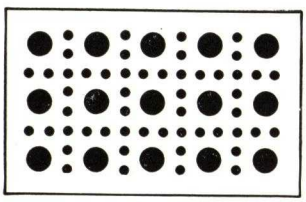
Invisible Door
(In Open Position)
This door can be had in any design of grille. Regularly furnished 5 in. x 5 in. When open, ready access to valves is provided



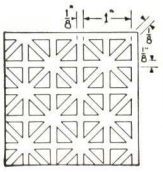


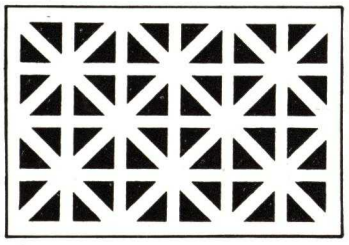
Design 820
Free air opening 50%

CANE DESIGNS IN PERFORATED METAL

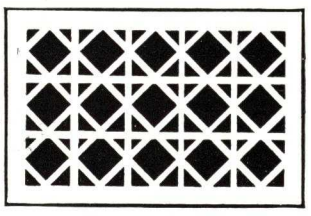


Design 500
Free air opening 29.4%
1/4-in. round center hole spaced 9/16 in. on centers

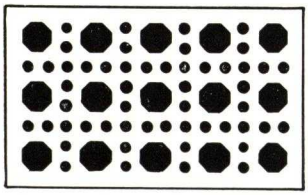




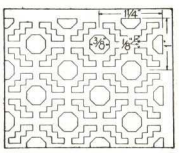
Croscane Design
Free air opening 37.4%

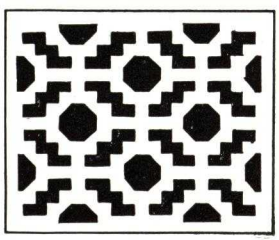


Wiscane Design
Free air opening 43.8%
5/16-in. square holes spaced 9/16 in. on centers

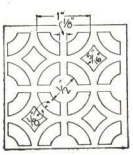


Design 1000
Free air opening 32.7%
5/16-in. octagonal center hole spaced 5/8 in. on centers





Lacecane Design
Free air opening 50%



Circane Design
Free air opening 47%

FERRO-CO CORPORATION

ESTABLISHED 1916

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MANUFACTURERS OF
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Recessed, Semi-recessed, Free Standing, Wall Hung, Window Sill, Fronts Only

Steel—Alloys—Aluminum—Brass—Monel Metal

Recessed Radiator Enclosures—For either copper or cast iron radiators. Made in any gauge metal. Any finish.

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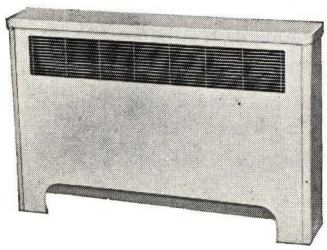
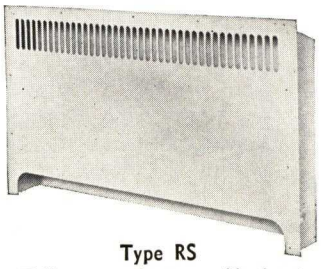
Consultation Service—Our experts are available for layout information.

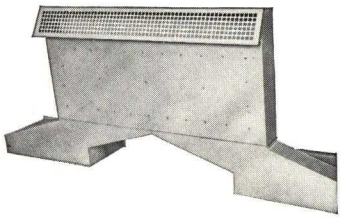


Type NBS
Semi-recessed or free standing; removable "Ful-flo" grille front
Rounded corner

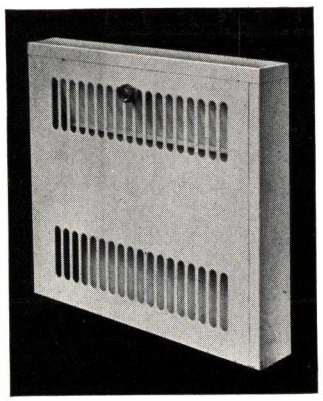
Type BSM with Damper Moulding
Semi-recessed—top grille, sanitary base



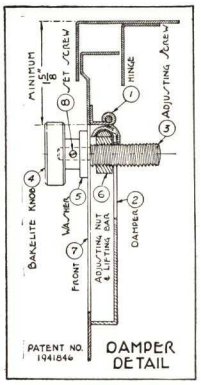
Type RS
Fully recessed—removable front

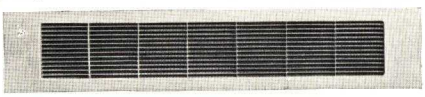


Special Design for Plaster Fronts

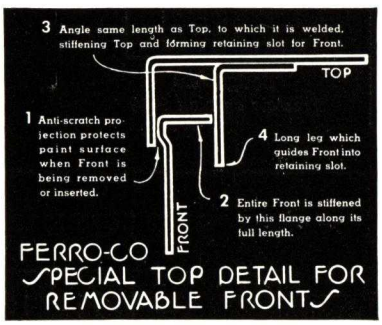


Type BG with Damper
Semi-recessed—top and bottom grille

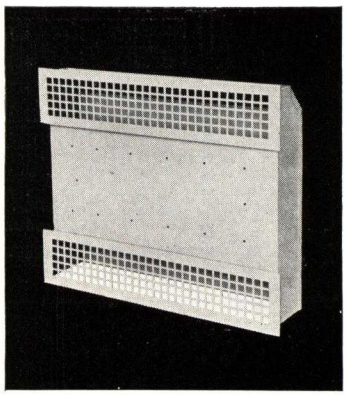




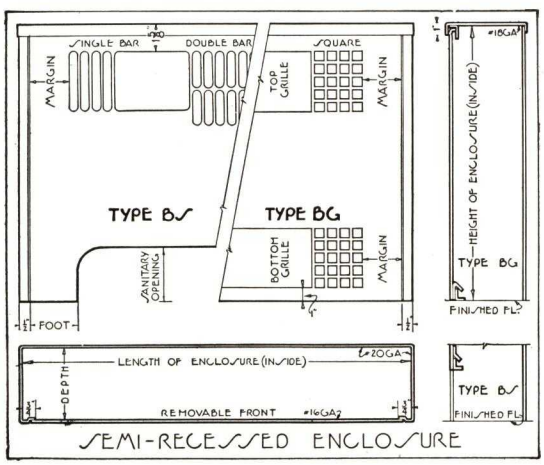
Ferro-co *Ful-flo* Grille
TRADE MARK REG.



PATENT NO. 2,102,599

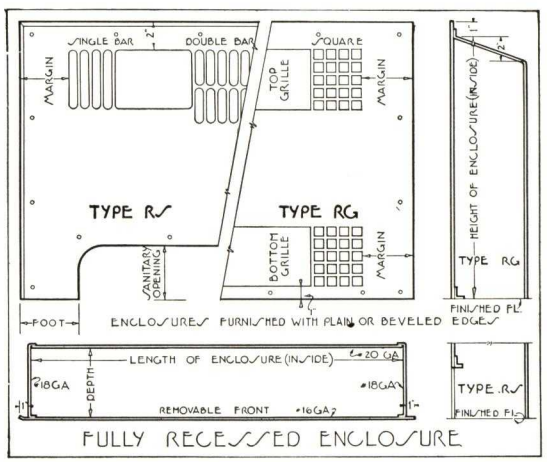


Type PFG
Plaster front—top and bottom grille



Send us your blue prints, rough sketches or description . . . we will quote you on any quantity, any finish.

Write for Catalog No. 38



Additional Service—Enclosures are only one division of our business. We also design and manufacture anything from any sheet metal of any gauge in any quantity with any finish. See Bulletins 5, 10, 20 and 30.

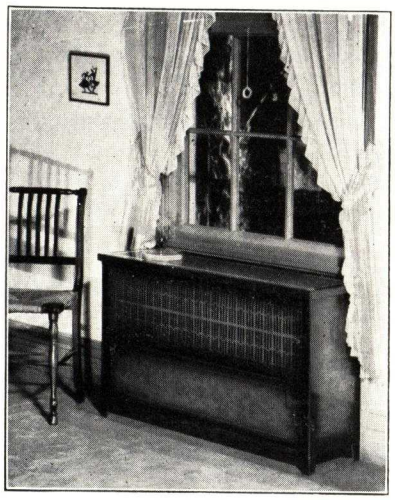
ESTABLISHED 1919

QUAKER CITY METAL PRODUCTS CORP.

Radiator Enclosure Products for Cast Iron and Convection Type Radiators

EXECUTIVE OFFICES AND FACTORY
200 North 14th Street, BROOKLYN, N. Y.
REPRESENTATIVES OR SALES OFFICES IN PRINCIPAL CITIES

DESIGNERS, ORIGINATORS AND PIONEERS IN THE RADIATOR ENCLOSURE FIELD SINCE 1925



The Navarre

General Description

Quaker City Radiator Cabinets are obtainable in a wide selection of designs, grilles and finishes. They are produced in a factory where steel and metal furniture is made for the trade.

Wood-grained finishes are a specialty and striping effects can be had at no additional cost.

Fronts and complete enclosures for convection type radiators furnished in all sizes.

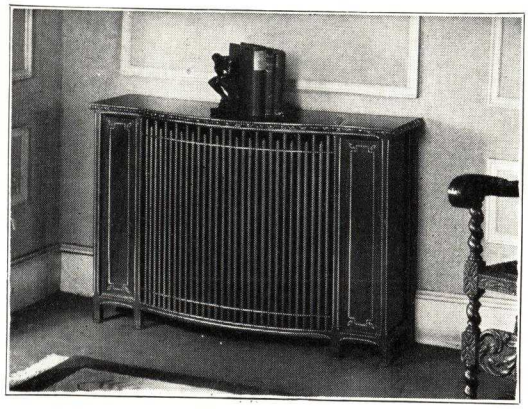
Other grille perforations in various frames and outlines.

Furnished in prime-coat, plain colors or wood-grained finishes.

Exclusive Construction Specifications

(1) **No. 16 Gauge Furniture Steel Tops**—Hinged for access to valve and pan.
(2) **Solid Steel Back and Ends**—Prevent radiator dust smudge.
(3) **Steel Tubular Framework** — Encases all grilles (except Navarre).
(4) **Galvanized Water Pan**—For aid in proper humidification.
(5) **Swivel Catch Beneath Top** — Increases radiator heat circulation.
(6) **Adjustable Leg Device**—To level cabinets on uneven floors.
(7) **Heavy Baked-on Enamel**—Undercoat and lacquer finish.
(8) **No Loss of Radiator Heat**—Front construction (approved by engineers).

13 YEARS OF RADIATOR CABINET SUPREMACY



The Marquise*
(*Patent No. 83124—Design Reg. U. S. Pat. Off.)

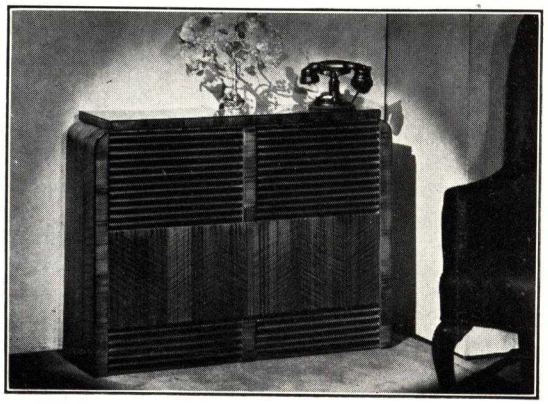
The Lorraine

Approved by Architects and Home Owners

Since 1925 radiator cabinets and shields, manufactured by the craftsmen of the Quaker City organization, have been installed in hundreds of apartment houses, public buildings, churches, clubs, hospitals, etc., and were chosen by thousands of home owners everywhere — because Quaker City Cabinets are beautiful, substantial, and will *not* retard radiator heat.

Illustrated Folder

Send for new illustrated folder —"Modern Modes in Radiator Concealment," in which additional designs are shown.



The Moderne*
(*Patent No. 94598—Design Reg. U. S. Pat. Off.)

Efficient Service— Prompt Deliveries

Quaker City representatives are technically trained in measuring to take care of all special conditions, so that radiators are properly enclosed.

Efficient Service
Prompt Deliveries

Type "S" Radiator Shield
Custom-built to fit any radiator and in any finish

WICKWIRE SPENCER STEEL COMPANY

RADIATOR ENCLOSURE DIVISION

Masters of Steelcraft for Over a Century

TELEPHONE
VAnderbilt 3-0900

GENERAL OFFICES
41 East 42nd Street, NEW YORK, N. Y.
DISTRICT OFFICES: WORCESTER, NEW YORK, BUFFALO, CHICAGO, SAN FRANCISCO

For Other Wickwire Spencer Products, Including Grilles, see File Index

WISSCO BETTER QUALITY ENCLOSURES, FRONT PANELS AND PERFORATED GRILLES

For Convector or Tube Radiators of All Makes

Enclosure Types: Free Standing, Recessed, Plaster Front, Wall Hung, Window Stools and Front Panels Only.
Perforated Grilles in Bronze, Brass, Aluminum, Monel or Steel

Wissco Enclosures and Front Panels are properly designed and constructed under the supervision of expert *heating* and *ventilating engineers.*

Standard Types as shown. Special types designed or constructed to your specifications and blueprints.

Material—First quality cold rolled steel, in gauges to No. 12.

Grille Designs—Bar type or square lattice standard. For special designs see File Index for our catalog on Grilles.

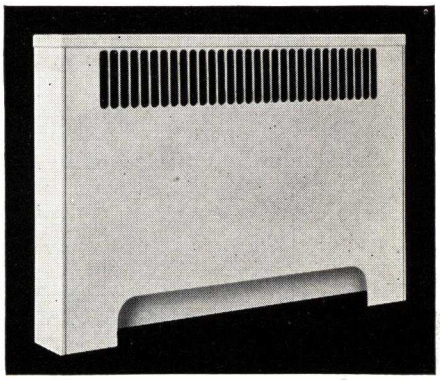
Standard Finish—Oven-baked gray prime coat outside, gray or black inside.

Special Finish—Choice of 36 solid colors, or natural wood grains (at slight additional cost). All color finishes six-coat oven-baked, for permanence and durability.

Extras—Access doors; hinged grilles; countersunk screwholes; beveled edge mouldings; dampers; baffles and insulation—supplied at nominal additional charge.

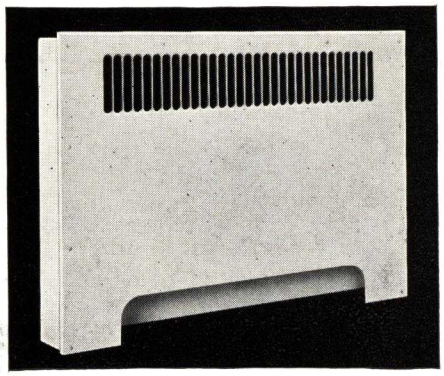
If quick reply is desired on rush jobs, please send schedule of sizes and types, blueprints or specifications, direct to J. G. Baker, Manager, Radiator Enclosure Division, New York, N. Y.

Note: Use inside dimensions in ordering convector enclosures.



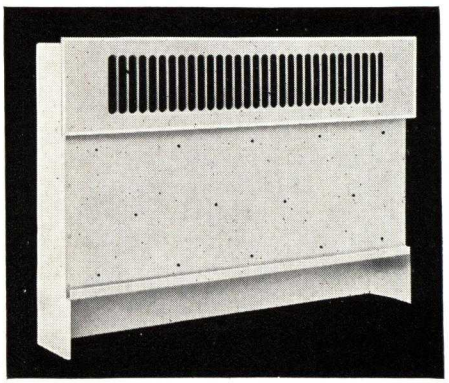
Type F.A. Enclosure

Snap-on, removable front enclosure, used for free standing, partial recess, or complete recessed. Face or top outlet grille, arched inlet.



Type O.F.A. Enclosure

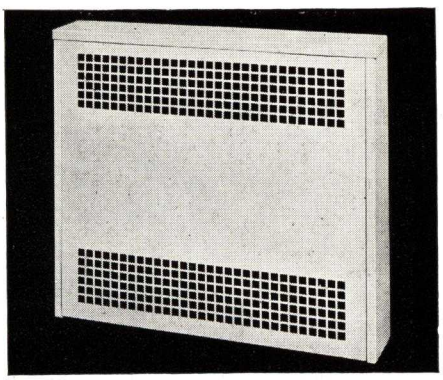
Overlap removable front panel for complete recess. Overlap tile or plaster top ½ in., ends ¾ in. Face or top outlet grille, arched inlet.



Type P.F.A. Enclosure

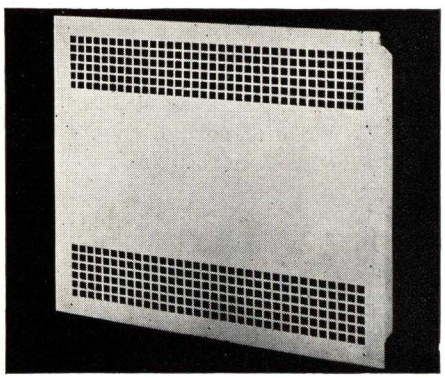
Plaster front, removable grille for complete recess in wall, allowance plaster ¾ in., tile 1½ in. Face or top outlet grille and opening inlet.

Types F.A. and F.A.A. are also available with Wissco's Exclusive Improvement: Adjustable Heights to compensate for uneven floors, sills, etc. Inquire about this feature.



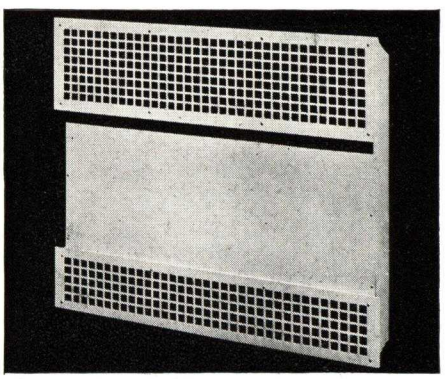
Type F.A.A.

Snap-on, removable front panel for free standing, partial recess, or complete recessed. Top outlet and lower inlet grilles.



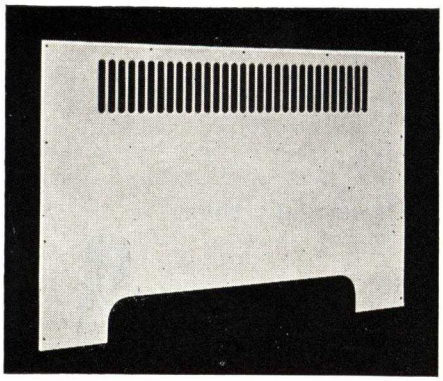
Type O.F.A.A.

Overlap removable front panel for complete recess. Overlaps tile or plaster top ½ in., ends ¾ in. Face or top outlet and lower inlet grilles.

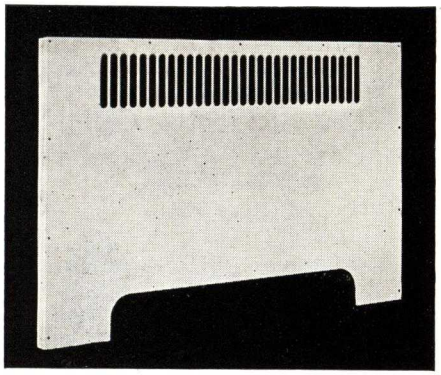


Type P.F.A.A.

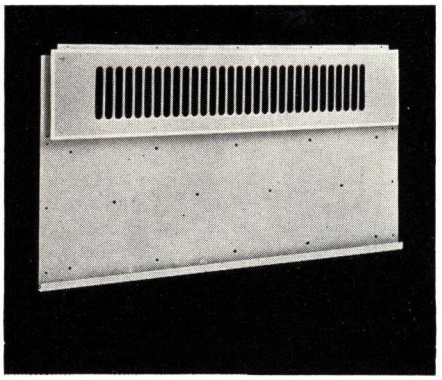
Plaster front, removable grille for complete recess in wall, allowance plaster ¾ in., tile 1½ in. Face or top outlet and lower inlet grilles.



No. 1—F.A. Front Panel
Removable front panel. F.A. Type—Face outlet grille, arch inlet. F.A.A. Type—Face outlet grille, lower inlet grille.



No. 2—E.F.A. Front Panel
Extended front, removable panel. E.F.A. Type—Face outlet grille, arch inlet. E.F.A.A. Type—Face outlet grille, lower inlet grille.



No. 3—P.F.A. Front Panel
Plaster front, removable grille. P.F.A. Type—Face outlet grille, inlet opening. P.F.A.A. Type—Face outlet grille, lower inlet grille.

WISSCO ALL-STEEL AIR HUMIDIFYING RADIATOR CABINETS OF DISTINCTIVE BEAUTY AND UTILITY

For Cast Iron Tube Radiators Only

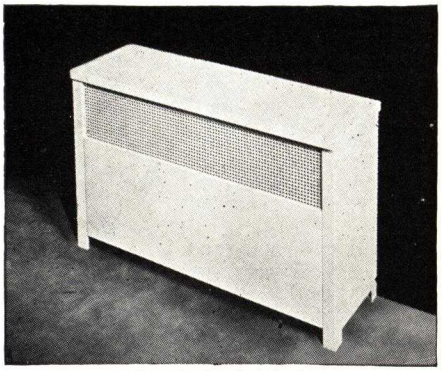
Standard Models

A variety of these moderately priced radiator cabinets are offered in stock sizes (and any intermediate size) in the styles illustrated below.

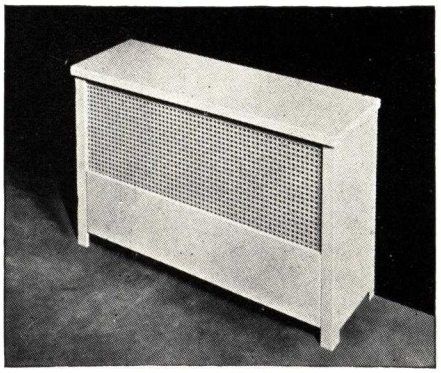
Construction—Prime furniture steel, up to 16-gauge, according to specifications. Welded construction or assembled type, latter quickly assembled or taken apart for cleaning, moving or storing. Individual parts easily replaceable instead of entire cabinet. Shipped in cartons, assembled type knocked-down.

Extra Features—Galvanized air humidifying pans; valve accesss doors; tip doors; insulation; special fittings for setbacks or window sills, baseboards, mouldings, pipes, radiator supports, etc.

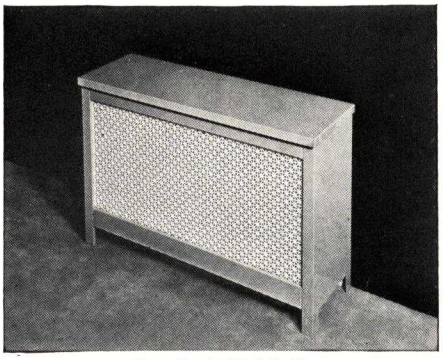
Finishes—Same as Custom-Built Models below.



Standard Model A



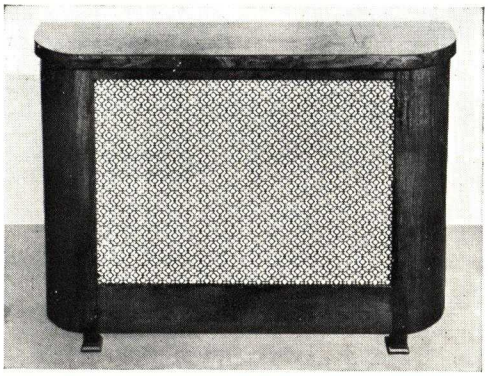
Standard Model B



Standard Model C

Custom-Built Models

These beautiful pieces of real furniture are slightly higher in price. They can be had to harmonize with any period treatment or special decorative motif. Available in a wide variety of styles and finishes and in any size.

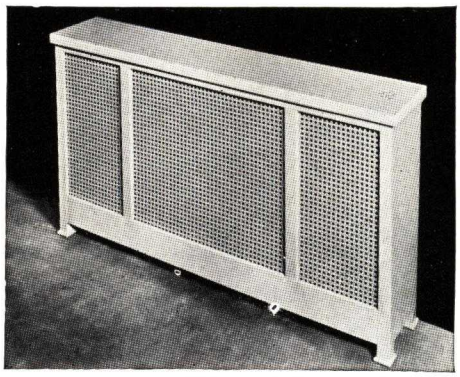


Custom Model B
One panel

Construction — Selected heavy gauge prime furniture steel, electrically welded throughout. Special adjustable feet.

Extra Features—Practically all the extra features of the Standard Models, such as copper air humidifying pan, valve access door, tip door, special fittings, etc., are included.

Standard Finishes — Baked-on prime coat, or choice of 36 solid colors in six-coat, oven-baked, durable, non-chipping enamel. Natural wood grains or matching special sample colors at slight extra charge.



Custom Model A
Three panels

CONSULTATION SERVICE—DELIVERIES

Architects, heating engineers, builders, contractors and others are cordially invited to consult us for specification writing and other requirements.

Prompt consultation service available for planning or layout. Wickwire Spencer extensive manufacturing and distributing facilities assure prompt dependable delivery.

ESTABLISHED 1894

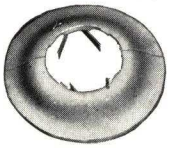
THE BEATON & CADWELL MFG. CO.

Heating and Plumbing Specialties

NEW BRITAIN, CONN.

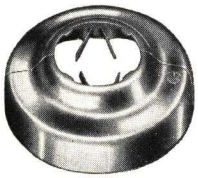
NEW YORK OFFICE: 234 Water Street—Telephone, BEekman 3-3967-68

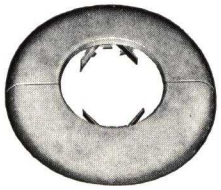
"Perfection" Floor and Ceiling Plates


No. 1

No. 3

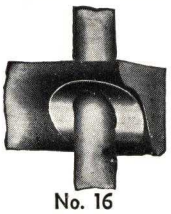
No. 3S


No. 36


No. 10 Hinged

No. 6A

No. 12


No. 16

No. 40

Types, Sizes and Description

Furnished in plain, nickel plated or chromium plated finishes.

No. 1—Sectional Floor and Ceiling Plate. Cast Iron or Brass. 1-in. flange. Sizes ⅛ to 12 ins.

No. 2—Same as No. 1, with set screw instead of springs.

No. 3—Hinged Floor and Ceiling Plate. Cast Iron or Brass. 1-in. flange. Sizes ⅜ to 4 ins.

No. 3A—Same as No. 3 but with set screw. Sizes ¼ to 4 ins.

No. 3S—Solid Floor and Ceiling Plate. Cast Iron or Brass. With or without set screw. Sizes ⅛ to 7 ins.

No. 36—Hinged Floor and Ceiling Plate, Cast Iron or Brass. 1-in. flange, sizes from ½ to 2 ins., inc. Furnished with set screw instead of springs if required. Used where sleeves extend ½ in. above floor.

No. 6—Sectional Floor and Ceiling Plate. Cast Iron or Brass. 1-in. flange. With set screw. 1¾ ins. high. Sizes ½ to 4 ins. Used where sleeves extend ¾ in. above floor.

No. 6A—Solid Floor Plate. Cast Iron or Brass. Can be furnished with set screw for ceiling use. Sizes ¼ to 5 ins. Used where sleeves extend 1½ ins. above floor.

No. 7—Same as No. 1, but with 1½-in. flange. Sizes ½ to 4 ins.

No. 9—Same as No. 1, but with 2-in. flange. Sizes ½ to 4 ins.

No. 10—The Original No. 10 Perfection Floor and Ceiling Plates of Sheet Steel or Brass. 1-in. flange. Sizes ¼ to 6 ins.

No. 10—Plate can be furnished in grained oak finish.

No. 10—Copper Service Tube Plates are available in sizes from ⅜ to 1½ ins. inclusive.

No. 11—Same as No. 10, but with set screw.

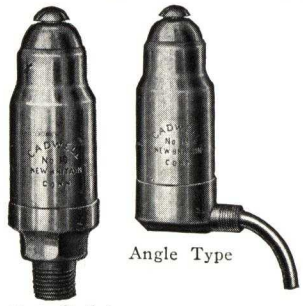
No. 12—Solid Floor Plate. Sheet Steel or Brass. 1-in. flange. Sizes ¼ to 4 ins.

No. 13—Same as No. 12, but with set screw for ceiling use.

No. 16—Special Ceiling Plate for Angle or Circle Cove. Made of Sheet Brass. Sizes ½ to 2½ ins.

No. 40—Hinged Floor and Ceiling Plate. Sheet Steel or Brass. 1-in. flange. Sizes ⅜ to 4 ins.

Cadwell Thermostatic Valves



Angle Type

Bottom Outlet
⅛ and ¼-in. and
¾ x ⅜-in. sizes

No. 10 Non-adjustable Thermostatic Valves

No. 50 Diaphragm Operated Thermostatic Vacuum Valves

"To Equalize" one-pipe steam systems. Bottom outlets available in customary sizes

Cadwell Relief Valves

No. 25

Cadwell No. 25—Pressure temperature and vacuum relief valve for range boilers; self-closing. Valve closed by internal pressure—not by heavy springs. Diaphragm operated.

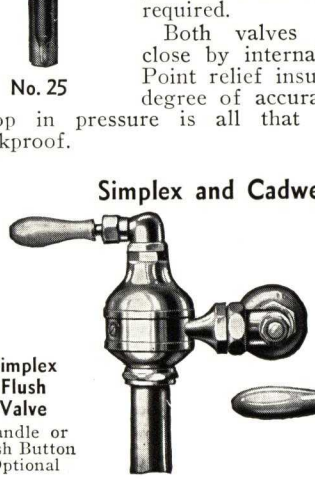
Cadwell No. 35 — Diaphragm type pressure and vacuum relief valve.

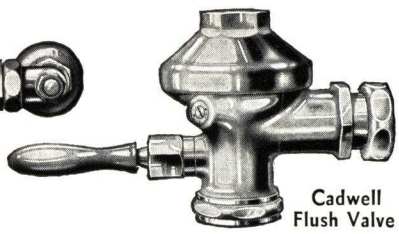
A typically dependable Cadwell valve, ideal for use with range boilers or storage tanks where a temperature relief valve is not required.

Both valves open and close by internal pressure. Point relief insures a high degree of accuracy. Slight drop in pressure is all that is required to close valve leakproof.

No. 35

Simplex and Cadwell Flush Valves


Simplex Flush Valve
Handle or Push Button Optional


Cadwell Flush Valve

Siphon Proof—Both valves constructed to prevent contents of bowls siphoning to supply pipe and contaminating water.

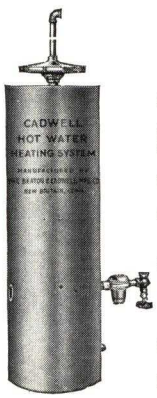
Simplex valves have integral "vacuum break" which allows air to enter valve with water, no moving parts required.

Cadwell valves have movable ball (placed above by-pass so that foreign matter cannot prevent proper action).

Outside By-pass Control—Both valves have time plug arrangement that allows valve to be adjusted from outside of valve. All valves regulated at the factory for the usual conditions.

By-pass has four different channels. If foreign matter accumulates in one of these it is possible to turn plug to one of the other three in which case the accumulation should be washed out without taking valve apart.

The Cadwell No. 45 System



A complete unit—nothing else to buy.

A departure from the conventional type of equipment as used with tank in basement systems.

To keep the expansion pressure in the system within practical working limits even under most sudden firing methods, as in oil burners.

Providing a means for elastic pressure distribution within the system.

Keeping the system filled to any desired pressure, and above all—to positively protect the boiler.

All of this is achieved in the most novel manner.

The Pressure governing and relief feature which has never been applied before—

(1) Has no springs
(2) Is governed entirely by physical laws
(3) It cannot increase the setting at any time
(4) It tests itself automatically as long as there is any water in system
(5) It is responsive to the slightest difference of pressure within the system
(6) Absolutely guaranteed to protect the boiler

Information relative to Pipe Hangers, Floor Sleeves, Rolls, Wood Wheel and Key Radiator Air Valves—furnished on request

THE BEATON & CORBIN MFG. CO.

Manufacturers of Floor and Ceiling Plates

SOUTHINGTON, CONN.

B & C FLOOR AND CEILING PLATES

All Floor and Ceiling Plates are made to fit standard iron pipe sizes, and the size indicated for each plate is the size which fits the corresponding iron pipe size. The standard width of flange of these Floor and Ceiling Plates approximates one-inch unless otherwise specified —the larger sizes being somewhat wider. Copper Service Tube Plates are made to fit style KLM Tube. Plate sizes fit corresponding tube sizes.

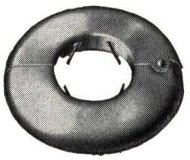
I. STAMPED PLATES—PACKED ONE DOZEN IN A BOX

No. 10

No. 1

No. 9

No. 25



No. 20

Style No.	Material	Sizes, inches	List price	Floor or ceiling	Held by	Special features
1	Steel or Brass	¼–3	Regular	Combination	Springs	Made to fit KL and M type Service Tube.
9	Steel	⅜–3	Regular	Combination	Prongs	Substantial and economical.
10	Steel or Brass	¼–6	Regular	Combination	Springs	Hinge and catch concealed. Standard plate for high class installations.
13	Steel or Brass	¼–6	Regular	Ceiling	Setscrew	No. 10 plate with setscrew.
16	Steel or Brass	½–2	Special—Write Factory	Ceiling	Setscrew	Solid plate—narrow flange with setscrew.
17	Steel or Brass	½–2	Special—Write Factory	Floor	.....	Solid plate with narrow flange.
20	Steel or Brass	⅜–4	Regular	Combination	Springs	No. 10 shape with rivet hinge. Reasonably priced.
25	Brass	⅜–1½	Special—Write Factory	Combination	Prongs	

Regular List Price

Size.....inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	12
Iron—Steel—Black.....	.15	.16	.17	.18	.20	.22	.25	.30	.50	.65	.80	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.25
N. P. Iron—Steel.....	.27	.28	.29	.30	.32	.35	.38	.45	.65	.80	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.50
Pol. or N. P. Stamped Brass....	.60	.62	.65	.72	.80	.85	1.00	1.50	1.80	2.25	2.75	3.25	3.75	4.25	.....	.....	.....	.....	.....	.....
Pol. or N. P. Cast Brass...	1.00	1.00	1.00	1.20	1.30	1.60	1.80	2.00	2.50	3.00	4.00	5.00	6.00	7.00	9.00	10.00	12.00	14.00	16.00	18.00

II. CAST PLATES—PACKED ONE DOZEN IN A BOX

No. 3

No. 4-5

No. 6

No. 6W

No. 7

No. 24

Style No.	Material	Sizes, inches	List price	Floor or ceiling	Held by	Special features
3	Iron or Brass	¼–12	Regular	Combination	Setscrew	Heavy—durable—complete size range.
4	Iron or Brass	½–4	Regular	Floor	.....	Solid plate.
5	Iron or Brass	½–4	Regular	Ceiling	Setscrew	Solid plate with setscrew.
6	Iron or Brass	¼–6	Regular	Floor	.....	Flat plate—designed for radiator connections.
6W	Iron or Brass	½–2	Regular	Floor	.....	Extra wide flange—1½-inch.
7	Iron or Brass	⅜–3	Regular	Combination	Springs or Setscrew	Heavy springs. Setscrew can be substituted on special order.
24	Iron or Brass	½–2	Regular	Combination	Setscrew or Springs	Bell shape with elevation to fit over ½-inch projections.

HEALY-RUFF COMPANY

776 Hampden Avenue
ST. PAUL, MINN.

E-Z RADIATOR AND LAVATORY HANGERS AND CONCRETE INSERTS

E-Z Radiator Hangers

Advantages—Anchor bolts can be placed in walls during construction. No accurate measurements are required since hangers have both horizontal and vertical adjustments.

Only one bolt is required in wall for each hanger. Expansion cannot affect anchor bolts in wall.

Entire hanger invisible when installed.

Adjustable for any height of baseboard.

Saves time and labor installing.

Applicable to walls of wood, brick, tile, or walls of any other material.

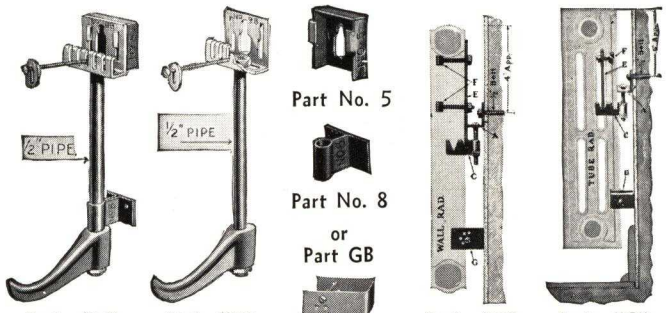
Easy to clean under radiators.

Style "H"—Places radiator 2½ in. from wall and provides for baseboard adjustment.

Style "R"—Places radiator 1½ in. from wall, but is not adjustable for baseboard. All Style "R" hangers are convertible (with parts No. 5 and No. 8) into Style "H."

Note: Both styles "H" and "R" can be used for wall, column or tube radiators. All column and tube radiators are held in at the top with an invisible washer. All parts made of pressed steel, except bottom hook supports. Vertical adjustments on Styles "H" and "R" made with ½-in. pipe.

Style "C"—Will hang wall, tube and the new "Fantom and Mural" type of radiation. Fully adjustable horizontally and vertically and has adjustment for irregular walls. Can be furnished for hanging either 1½ or 2½ in. from wall. Hanger is complete, no nipples required.

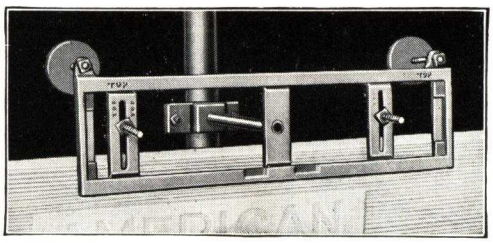


Style "H" with Baseboard Adjustment | Style "R" without Baseboard Adjustment | *(Part GB Allows for In-and-Out Adjustment)* | Style "C" with Wall Radiator | Style "C" with Tube Radiator

Typical Specifications—*General*—All radiation, unless otherwise noted, shall be supported from the wall on Style "..." E-Z Radiator Hangers, placing the radiator .. inches from the wall, as manufactured by the HEALY-RUFF COMPANY, St. Paul, Minn., or equal, and approved in writing by the architect or engineer. The heating contractor shall furnish and install for each hanger the proper type of suspension bolt. The number of hangers to be used for each radiator shall be as recommended by the manufacturer.

E-Z Lavatory Hanger

Offers a practical means for hanging all lavatories and kitchen sinks. Hanger is made of iron and furnished complete as shown below, except ⅜-in. pipe.



E-Z Lavatory Hanger

Advantages—Easy, quick and economical to install. Can be fastened securely to form rigid hanger either with or without clamping to vent pipe.

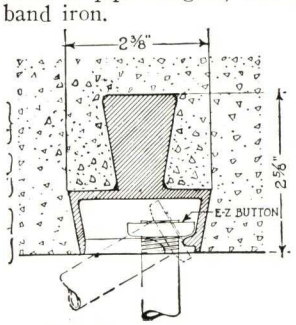
Gives firm, substantial support permanently—cannot slip or come loose from wall. No lavatory pedestal legs or other support necessary.

Installed in wall without extra frame of wood or other material. Can be built into wall during or after construction. It is not absolutely necessary to attach to vent pipe, but preferable when possible.

E-Z Lavatory Hanger fits all size lavatories and meets all conditions. It is fully adjustable both horizontally and vertically. Exact position need not be figured when setting.

E-Z Concrete Insert

An insert with special features making it adaptable to all sizes of pipe hangers, whether supported by pipe, bolt, rod or band iron.



E-Z Concrete Insert

Advantages—Made in just one size, and this one size accommodates ⅛, ¼, ⅜ and ½-in. pipe and ⅜, ½, ⅝, ¾ and ⅞-in. rod or bolt.

Has ball and socket connection between insert and hanger.

Fully adjustable—allows play to compensate for expansion and accurate alignment of inserts.

E-Z Button turns in the insert —no couplings or turnbuckles needed.

"Makes Pipe Hanging Easy."

TYPE "PW" CONTROL FOR PRESSURE (HYDRO-PNEUMATIC) TANKS

Operation

Automatically controls both water levels and air pressure in any size tank from 2 ft. to 10 ft. in diameter.

Installation

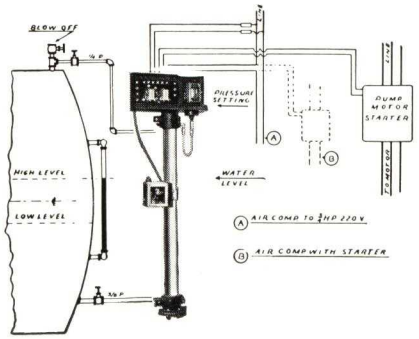
Easy and inexpensive to install and operate.

Safety

Protects the tank from excessive pressure and the system from water hammer

Efficiency

Checks and corrects both water level and air volume at each cycle of operation.



Economy

Type "PW" Control eliminates attention and reduces the pumping cost.

"The Water Level Controls Co., 776 Hampden Ave., St. Paul, Minn., manufactures the Type "PW" Control, as well as controls for operating one or more pumps, electric valves, compressors, alarms, signals, etc., in connection with all types of tanks and water systems. Their line includes elevated tank controls, float switches, pressure switches, hydro-pneumatic tank controls, sump controls, sewage ejector controls and special controls. This company is affiliated with the HEALY-RUFF COMPANY."

THE ANTHONY COMPANY

Liquid Fuel Engineers

47-33 Fifth Street, LONG ISLAND CITY, N. Y.

Products

ANTHONY NEBULYTE OIL BURNING and GAS BURNING SYSTEMS for steam boilers, hot water heaters, hot air furnaces, cooking ranges, etc.

ANTHONY NEBULYTE SYSTEM for Heavy Gravity Oil.

ANTHONY SINGLE and DUPLEX STRAINERS.

ANTHONY STEAM and ELECTRIC FUEL OIL HEATERS.

TANK SUCTION UNITS.

Engineering Service

Anthony engineers are prepared to discuss all heating problems and design special oil, tar or gas fired apparatus for specific needs.

Having designed a great variety of successful industrial heat treating systems, they have wide experience in this field to place at a client's disposal.

THE ANTHONY COMPANY since its organization has dealt with every application as an individual combustion problem, appreciating, as few others have, its many sensitive and variable conditions and accurately meeting these by correctly utilizing essential principles.

They are pioneers in the development of mechanical nebulization as applied to the combustion of liquid fuel, as well as in the application of those combustion principles which effect the accurate control of heat quality.

Employment of their services leads to conservation of fuel, speeding up of heat cycles and better quality of results as 5000 clients will testify.

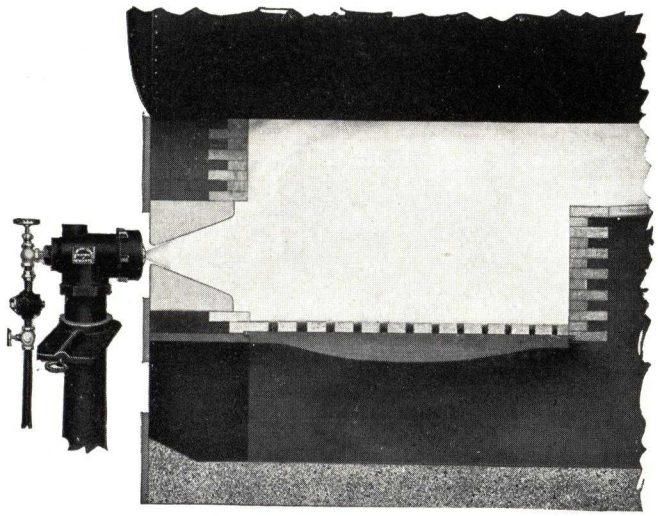
More than 31 years of record-smashing success.

Anthony Nebulyte System for Boilers

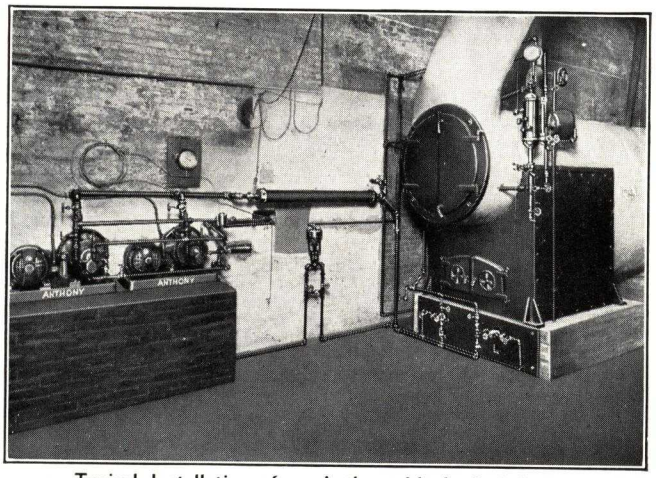
The Anthony is a mechanical nebulizing system for liquid fuel, which actually attains the perfection of radiant gas firing and normally produces 80% to 86% evaporating efficiency.

In this highly developed system of gas firing with oil fuel, an instantaneous conversion of liquid to gas is effected by correct combination of essential elements.

Performance—Every item of Anthony equipment has been selected and developed to meet exacting requirements, and is fully guaranteed to be free from defects in materials and workmanship. In spite of the severest operating conditions, the annual maintenance costs have averaged no more than 2% over a period of 10 years. A completely installed Anthony Nebulyte system is 100% assurance of successful operation.



Gas Firing with Oil Fuel



Typical Installation of an Anthony Mechanical System
(Units in duplicate)

Equipment—This includes storage tanks and fittings, suction and discharge strainers, heaters, pumps, blowers, burner sets, valves, piping, gauges and thermometers, together with firing chambers and attachments.

Anthony oil heaters, for use with heavy gravity oils, are supplied to give the required temperature to the particular grade of oil specified. Complete with safety relief valve, thermometer and, where desired, with automatic temperature control. Either steam or electric.

Anthony strainers are made in both single and duplex patterns. In the duplex strainers, either side can be cut out of service by a single lever movement. They need never be taken apart for cleaning. They are easily applied to any pipe line. The cleaning operation is made so simple that there is no excuse for strainers ever becoming foul.

Control—Usually by hand, but automatic controls of proven reliability can be furnished, where specified, to maintain definite boiler pressure, water temperature, or both.

Application—The Anthony Nebulyte system is adapted for burning oil or gas under heating and power boilers in apartment houses, hotels, clubs, public buildings, etc. The combination oil and gas system offers special advantages in many instances.

Anthony Nebulyte System for Heavy Gravity Oil

Heavy gravity asphaltum base oils cause many troubles and often condemn an oil burning system that is not installed to provide for all the necessary conditions. Yet the use of such oils at their lower prices is often necessary in order to show satisfactory operation figures in comparison with coal. The Anthony system can be installed to handle such oils equally as well as those of lighter gravity.

Changing Present Systems for Heavier Oils—The overcoming of existing troubles and improvement in the present operating conditions of other systems already installed, comprise a major portion of the work of THE ANTHONY COMPANY. Send us full details.

AUTO-HEAT CORPORATION

Manufacturers of Fuel Oil Burners

GENERAL OFFICE

311 West 66th Street, NEW YORK, N. Y.

EXPORT DEPARTMENT—Cable Address: Skyline—N. Y.

THE PRODUCT

Auto-Heat oil burners offer the architect a burner for every heating requirement from the smallest home to those demanding 7,500 feet of steam radiation. Made of the highest quality materials by experienced craftsmen, the burner is built to last a lifetime and comes with all parts guaranteed against defective workmanship and material. Models for hot air and air conditioning plants.

Listed as standard by the Underwriters' Laboratories

Auto-Heat burners are designed to burn the ordinary grades of fuel oil and at the same time to provide efficient combustion and full heat utilization. We base our nozzle requirements at 300 feet of steam radiation and 450 feet of hot water radiation per gallon per hour. An Auto-Heat burner can be installed in an existing system in a few hours.

MECHANICAL DESCRIPTION

All Auto-Heat burners of the "G" type have the following standard equipment: Leland motors of a speed of 1,750 r.p.m.; Tuthill pumps; electric ignition; Webster transformers; cast iron housing of special Auto-Heat design; Cuno filter strainer; Auto-Heat valves (see below); cast iron blower tubes; standard stainless steel nozzles; Minneapolis-Honeywell stackswitch, thermostat and limit control; 100 pounds operating pressure; and special Auto-Heat designed air diffuser. The burners rest on a base which is adjustable in height and are balanced at the center of gravity to eliminate vibration.

Valve—An exclusive Auto-Heat-designed feature. The differential between the operating pressure and the shutoff pressure is so slight it can be graduated within 10 pounds. The valve by-passes and returns to storage tank, or suction line, that portion of the oil delivered by the pump but not required by the nozzle. It maintains a constant pressure at the nozzle. It cuts off the flow to the nozzle the instant pressure falls below a predetermined setting (usually 80 pounds). It prevents oil being delivered to the nozzle at too low a pressure for proper atomization, and prevents syphoning when storage tank is located above the burner.

It combines air relief, pressure relief and pressure regulating. No *needle valve* is employed in its construction. Positive in action, yet sensitive to operating conditions.

Air Control Shutter—Another exclusive feature. It facilitates the making of fine adjustments, and its construction tends to reduce noise from air intake. Result: greater burner efficiency.

Air Diffuser—Especially designed for the highest efficiency flame, it gives a positive spiral swirl to the air as it is blown into the combustion chamber.

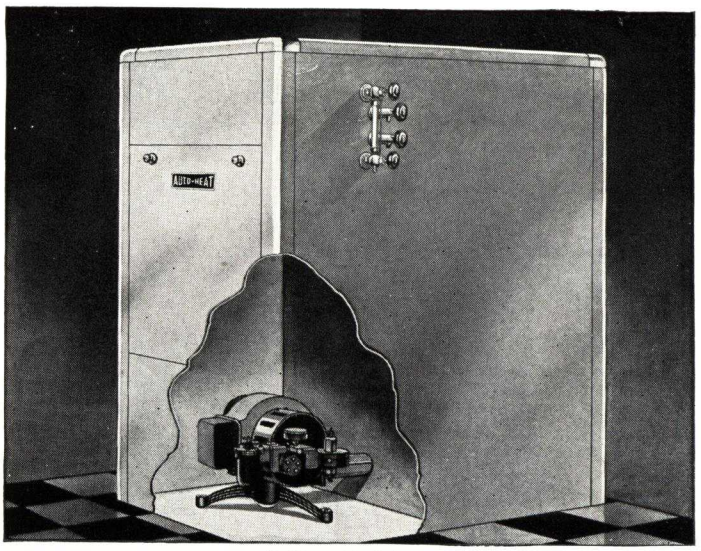
Blower Tube—On Auto-Heat's cast iron blower tube is a saddle held in place by a hand-set screw for the purpose of inspecting and adjusting electrodes at time of installation.

Accessibility—All parts of an Auto-Heat burner are completely accessible.

Model G-1 Auto-Heat Burner

Model G-0 Auto-Heat Burner

Model F-1 Short-Gun



Cabinet Model

OTHER MODELS

The F-1 Model is made with a flange mounting and short gun, readily adaptable to all types of Oil Burner Boilers—jacket enclosed.

The G-0 small gun type model is practically identical in design with the "G" models with the exception of its smaller size and limited (2 g.p.h.) capacity. It meets the requirements of the builder of small multiple dwellings.

Model	Fuel capacity, g.p.h., max.	Steam radiation, sq. ft., max.	Hot water radiation, sq. ft., max.	Motor hp.
F-1	2½	800	1,200	⅙
G-0	2	600	900	1/10
G-1	2½	800	1,200	⅙
G-2	6	1,800	2,700	⅙
G-3	15	4,500	6,250	¼
G-4	25	7,500	11,250	½

LET US SOLVE YOUR SPECIAL PROBLEMS

Our engineers will gladly co-operate with you, upon request.

ESTABLISHED 1855

THE BROWNELL COMPANY

DAYTON, OHIO

Sales and Service Agencies in All Principal Cities Throughout the U. S. A.

Products

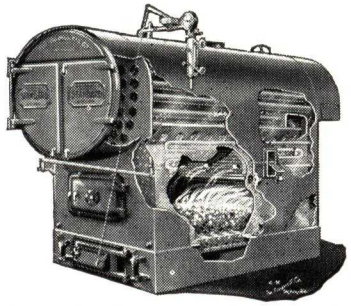
BOILERS — Large Capacity Steel Heating Boilers; Residence Steel Heating Boilers; H.R.T. Boilers for Power and Process; Double Pass Riveted Firebox Boilers; Scotch Boilers; Vertical Tubular Boilers; Feed Water Heaters; Stacks, Breechings, etc.

TRADE-MARK

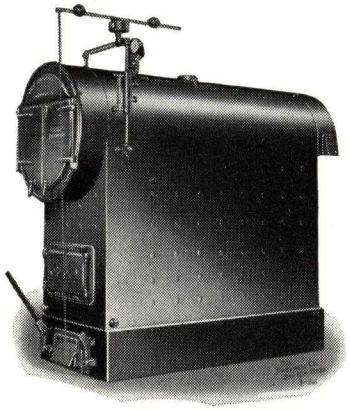
STOKERS—Heavy Duty, Single Retort, Ram Type Underfeed Stokers; Industrial, Worm Feed Type Side Dump Stokers; Commercial, Worm Feed Type Stokers; Residence and Small Buildings Underfeed Stokers.

BROWNELL "STANDARD" WELDED STEEL HEATING BOILER SMOKELESS TYPE

Boiler No.	Capacity, sq. ft.	
	Steam	Water
S-4	1800	2880
S-5	2200	3520
S-6	2600	4160
S-7	3000	4800
S-8	3500	5600
S-9	4000	6400
S-10	4500	7200
S-11	5000	8000
S-12	5550	8880
S-13	5990	9580
S-14	6560	10490
S-15	7540	12060
S-16	8280	13240
S-17	9040	14460
S-18	10440	16700
S-19	11830	18920
S-20	13000	20800
S-21	13880	22200
S-22	14750	23600
S-23	15980	25560
S-24	17000	27200
S-25	18320	29310
S-26	20440	32700
S-27	22560	36090
S-28	25000	40000
S-29	28290	45260
S-30	31150	49840
S-31	34030	54440



Brownell "Standard" Welded Steel Heating Boiler—Smokeless Type



Brownell "Standard" Welded Steel Heating Boiler—Direct Draft Type

For hand or mechanical firing

BROWNELL "STANDARD" WELDED STEEL HEATING BOILER DIRECT DRAFT HIGH LEG TYPE FOR MECHANICAL FIRING

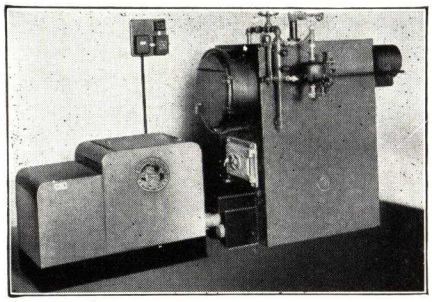
Boiler No.	Capacity, sq. ft.	
	Steam	Water
S-250R	980	1560
S-251R	1200	1920
S-251	1410	2250
S-252	1710	2730
S-253	1950	3120
S-254	2310	3690
S-255	2820	4510
S-256	3310	5290
S-257	3820	6110
S-258	4470	7150
S-259	5100	8160
S-260	5740	9180
S-261	6440	10300
S-262	7120	11390
S-263	7670	12270
S-264	8400	13440
S-265	9640	15420
S-266	10560	16890
S-267	11510	18410
S-268	13310	21290
S-269	15040	24060
S-270	16560	26490
S-271	17660	28250
S-272	18730	29960
S-273	20310	32500
S-274	21550	34480
S-275	23220	37150
S-276	25870	41390
S-277	28610	45770
S-278	31740	50780
S-279	35790	57260
S-280	39460	63130
S-281	43130	69000

Brownell Boilers

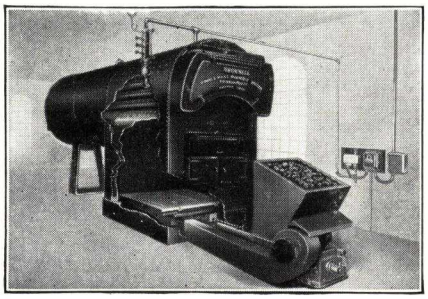
Above boilers in direct draft type, available in five smallest sizes with enamel steel jacket and insulation. Brownell Boilers equipped with self-contained refractory arch and air admitting dampers (when requested) for use in cities having ordinances requiring provision for operation of heating boilers smokelessly. Direct draft type also made especially for stoker, oil or gas firing in full range of sizes up to and including 43,130 sq. ft. of steam capacity.

Construction

THE BROWNELL COMPANY, with over 80 years' experience in the combustion field, is a pioneer manufacturer of both boilers and stokers. Brownell Steel Heating Boilers are of one-piece electrically welded construction. They are particularly designed for long gas travel, spacious combustion, large steam liberating area, rapid steaming, and low maintenance costs. Brownell Stokers are made in a wide range of both types and sizes, designed to meet individual boiler room needs and are of unusually rugged construction.



Brownell Type D Fully Enclosed Domestic and Small Commercial Stoker and Steel Residence Boiler



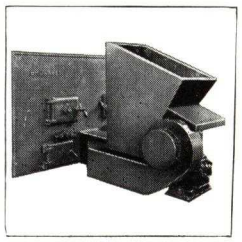
Brownell Riveted Double Pass Firebox, High Pressure Boiler and Type C Worm Feed Commercial Stoker

Information and Literature

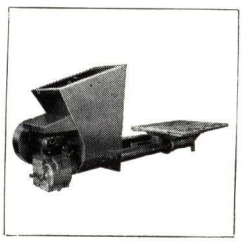
THE BROWNELL COMPANY will be pleased to furnish descriptive bulletins giving detailed information covering their products.

A Data Folio, giving complete engineering data and information on both boilers and stokers, is available for architects and consulting engineers.

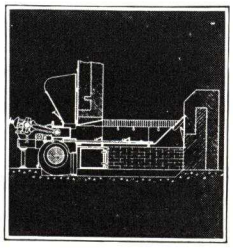
Write for complimentary copy.



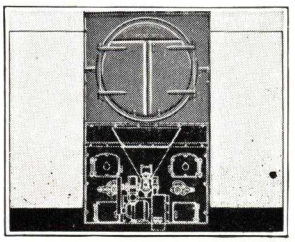
Brownell Industrial Worm Feed Side Dump Stoker



Brownell Commercial Worm Feed Type Stoker



Brownell Heavy Duty Ram Type Stoker



Brownell Ram Type Heavy Duty Stoker and Brownell H.R.T. High Pressure Boiler

COLUMBIA RADIATOR COMPANY

MAIN OFFICE AND FACTORY

McKEESPORT, PA.

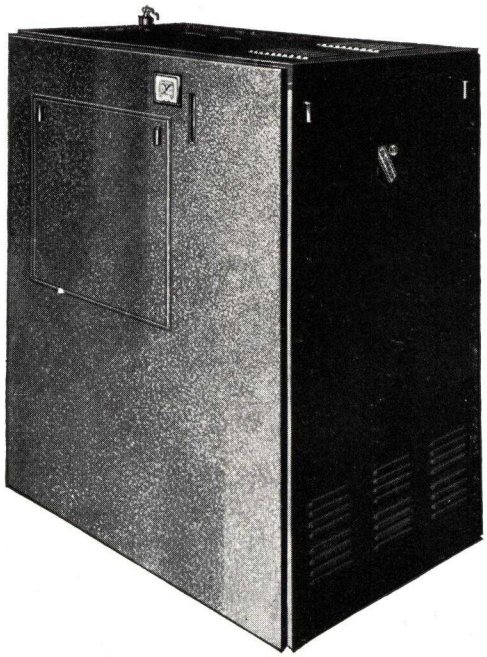
WAREHOUSES AND BRANCH OFFICES

BOSTON, MASS., 450 Rutherford Ave., Charlestown—Charlestown 0578
CHICAGO, ILL., 39th and Wallace Sts.—Boulevard 1711
PHILADELPHIA, PA., American and York Sts.—Nebraska 7543
NEW YORK, N. Y., 76th and 77th Sts., Glendale, L. I.—Hegeman 3-8000
NEWARK, N. J., 429 Adams St.—Market 3-6166
WASHINGTON, D. C., 600 Newton Place N. W.—Columbia 2612
WILLIAMSPORT, PA., 200 Basin St.—Williamsport 2612

COLUMBIA OIL BURNING BOILER—BUILT AND DESIGNED FOR OIL ONLY

Beauty Plus Efficiency—Helps Sell New Residences

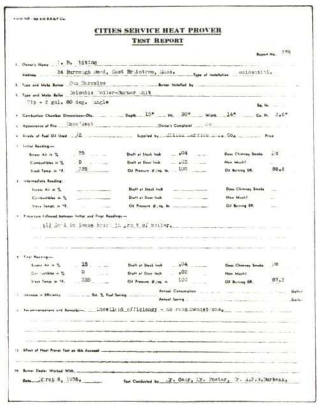
Airtight Construction—Rope Asbestos—No Cement—Water Base—Complete Circulation Each Section



Beauty—Bright Red and Black

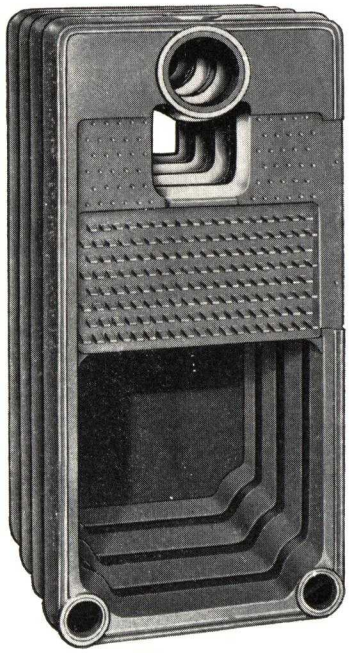
27 in. for oil burner. Water heater, oil burner and controls inside jacket

City Service Heat Prover Test Report



CITIES SERVICE HEAT PROVER
TEST REPORT

Actual Installation



Efficiency

Note heating surface to absorb what the oil burner develops

SPECIFICATIONS

No. of Boiler	Steam D.C.I.R. Rating	Water D.C.I.R. Rating	Heating Surface, sq. ft.	Combustion Space, cu. ft.	Fire Box		Boiler Dimension			Jacket Dimensions			Space for Burner, in.
					Length, in.	Width, in.	Length, in.	Width, in.	Height, in.	Length, in.	Width, in.	Height, in.	
0319	300	480	35.8	3.2	14⅜	19	16⅛	23½	49¾	43¼	26⅝	51 5/16	27½
0419	450	720	52.3	4.5	20⅜	19	22⅛	23½	49¾	51¼	26⅝	51 5/16	27½
0519	600	960	68.8	5.8	26⅜	19	28⅛	23½	49¾	57¼	26⅝	51 5/16	27½
0619	750	1200	85.3	7.1	32⅜	19	34⅛	23½	49¾	63¼	26⅝	51 5/16	27½
0719	900	1440	101.8	8.4	38⅜	19	40⅛	23½	49¾	69¼	26⅝	51 5/16	27½

Water line 44¾ in.

Capacities are based on *net* installed radiation and nothing need be added for normal piping and pick-up. When domestic water heater is installed add 1 sq. ft. per gal. to steam radiation and 2 sq. ft. per gal. to water radiation for each tank gallon.

The Standard Jacket or "C" & "F" series is only furnished in three and four-section boilers. The width of this jacket is 25¾ in. and lengths are 18¾ and 24⅜ in., respectively. All other dimensions are same as extended jacket series.

COLUMBIA SQUARE AND ROUND BOILERS—RADIATORS

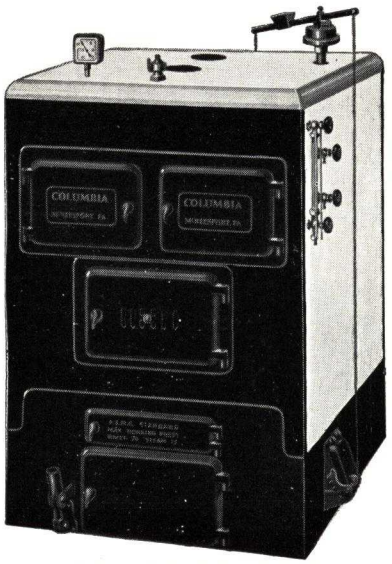
COLUMBIA SQUARE BOILERS

Boiler No. Steam or Water	Maximum capacity, sq. ft.		E. D. R. rating, sq. ft.		Grate area, sq. ft.	Base dimensions, in.	Number and size (in.) of supply tappings
	Steam	Water	Steam	Water			
417	400	675	250	400	1.50	24 7/8 x 17 5/8	2—2½
517	575	950	360	575	2.00	24 7/8 x 22	2—2½
617	750	1250	470	750	2.50	24 7/8 x 26 1/4	2—2½
717	925	1550	580	925	3.00	24 7/8 x 30 5/8	2—2½
817	1100	1850	690	1100	3.50	24 7/8 x 35	3—2½
917	1275	2150	800	1275	4.00	24 7/8 x 39 1/4	3—2½
521	1225	2050	700	1100	4.00	32½ x 31	2—3
621	1525	2550	850	1425	4.85	32½ x 37	2—3
721	1825	3050	1000	1750	5.70	32½ x 43	3—3
525	1550	2575	900	1500	5.55	37 x 35	2—4
625	1850	3075	1150	1850	6.74	37 x 42	2—4
725	2150	3575	1400	2200	7.93	37 x 49	2—4
825	2450	4075	1650	2550	9.12	37 x 56	2—4
925	2750	4575	1900	2900	10.31	37 x 63	3—4

Coil openings are located in back section for direct water heater.

Return tappings (two return tappings rear of boiler).
17-in. boiler—2½-in. tappings.
21-in. boiler—4-in. tappings.
25-in. boiler—5-in. tappings.

Tappings furnished on each side for indirect water heater.



Columbia Square Boiler
21-in. and 25-in. Series

Jacket Dark Red and Black

Jacket Dark Red and Black

Columbia Square Boiler
17-in. Series

COLUMBIA SMOKELESS BOILERS

Boiler No. Steam or Water	Maximum capacity, sq. ft.		E. D. R. rating, sq. ft.		Grate area, sq. ft.	Base dimensions, in.	Number and size (in.) of supply tappings
	Steam	Water	Steam	Water			
725	2150	3575	1400	2200	7.93	37x49	2—4
825	2450	4075	1650	2550	9.12	37x56	2—4
925	2750	4575	1900	2900	10.31	37x63	3—4
1025	3050	5075	2150	3250	11.50	37x70	3—4
1125	3350	5575	2400	3600	12.69	37x77	3—4

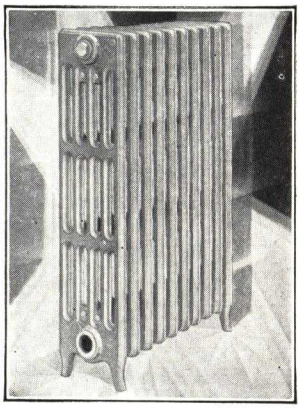
Two 5-in. return tappings on rear of boiler.

COLUMBIA RADIATOR

Slender—Graceful and Modern

Number of sections	Length 1½ in. per section	3-Tube 3¼ in. deep*			4-Tube 4 15/16 in. deep*			5-Tube 5 11/16 in. deep*		
		19 in. height	22 in. height	25 in. height	19 in. height	22 in. height	25 in. height	20 in. height	23 in. height	26 in. height
		1.1 sq. ft. per sect.	1.3 sq. ft. per sect.	1.5 sq. ft. per sect.	1.4 sq. ft. per sect.	1.6 sq. ft. per sect.	1.8 sq. ft. per sect.	1.8 sq. ft. per sect.	2.1 sq. ft. per sect.	2.4 sq. ft. per sect.
2	3	2.2	2.6	3.0	2.8	3.2	3.6	3.6	4.2	4.8
4	6	4.4	5.2	6.0	5.6	6.4	7.2	7.2	8.4	9.6
6	9	6.6	7.8	9.0	8.4	9.6	10.8	10.8	12.6	14.4
8	12	8.8	10.4	12.0	11.2	12.8	14.4	14.4	16.8	19.2
10	15	11.0	13.0	15.0	14.0	16.0	18.0	18.0	21.0	24.0
12	18	13.2	15.6	18.0	16.8	19.2	21.6	21.6	25.2	28.8
14	21	15.4	18.2	21.0	19.6	22.4	25.2	25.2	29.4	33.6
16	24	17.6	20.8	24.0	22.4	25.6	28.8	28.8	33.6	38.4
18	27	19.8	23.4	27.0	25.2	28.8	32.4	32.4	37.8	43.2
20	30	22.0	26.0	30.0	28.0	32.0	36.0	36.0	42.0	48.0
22	33	24.2	28.6	33.0	30.8	35.2	39.6	39.6	46.2	52.8
24	36	26.4	31.2	36.0	33.6	38.4	43.2	43.2	50.4	57.6
26	39	28.6	33.8	39.0	36.4	41.6	46.8	46.8	54.6	62.4
28	42	30.8	36.4	42.0	39.2	44.8	50.4	50.4	58.8	67.2
30	45	33.0	39.0	45.0	42.0	48.0	54.0	54.0	63.0	72.0
Sq. ft. per lineal inch		0.733	0.867	1.000	0.933	1.067	1.200	1.200	1.400	1.600

*Depth at feet same as depth of section. Add ½ in. to length for each bushing. Bottom tapping 1¼ in. i.p. Top tapping 1 in. i.p.



McKeesport Radiator

McKEESPORT RADIATION

Tubes	Width of section, in.	Feet per section						
		36 in.	30 in.	26 in.	23 in.	20 in.	16½ in.	13½ in.
3	5	3½	3	2⅓	2	1¾	.....	.....
4	6 5/8	4¼	3½	2¾	2½	2¼	.....	.....
5	8 3/8	5	4⅓	3½	3	2⅔	.....	.....
6	9¾	6	5	4	3½	3	.....	.....
7	12	7	6	5	4¼	3⅔	3	2½

ESTABLISHED 1864

FARRAR & TREFTS INC.

BUFFALO, N. Y.

Heating and Power Boilers

Bison Compact Boilers
Bisonette Compact Boilers
Firebox Return Tubular Boilers
Firebox Locomotive Type Boilers
Scotch Marine Type Boilers
Vertical Boilers
Horizontal Return Tubular Boilers
Bison Two-pass Return Tubular Boilers

Steel Plate Construction

Storage and Pressure Tanks
Receivers, Welded or Riveted
Steel Pipe, Welded or Riveted
Buoys, Welded or Riveted
Condensers and Kettles
Smokestacks and Breechings
Special Work in Stainless Steel, Everdur, Nickel, Aluminum or Monel Metal

BISON COMPACT WELDED HEATING BOILERS

The F&T Bison Compact Welded Heating Boiler has been designed carefully so as to have a large furnace volume, the proper volume of water, just the right amount of steam liberating surface, the correct volume for steam storage and a balanced circulation. The result is a remarkably steady water line—*a balanced boiler.*

Construction is in accordance with the A.S.M.E. Code and boilers are designed for hand firing with anthracite or bituminous coal or for mechanical firing with oil, gas or stoker. All ratings are as required by the Steel Heating Boiler Institute.

FARRAR & TREFTS INC. have designed a *special Bison Compact* boiler with a *high firebox* which is ideally suited to stoker firing. The increased volume of the furnace makes it the perfect boiler for efficient and continuous operation with a stoker.

STANDARDIZED 100 SERIES—BISON COMPACT WELDED BOILERS—15-LB. W. P.

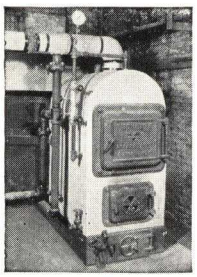
Boiler No.*	150	152	154	156	158	160	162	164	166	168	170	172	174	176	178	180	182	184	186
Steam rating (Hand fired) sq. ft.	1800	2200	2600	3000	3500	4000	4500	5000	6000	7000	8500	10000	12500	15000	17500	20000	25000	30000	35000
(Mech. fired) sq. ft.	2190	2680	3160	3650	4250	4860	5470	6080	7290	8500	10330	12150	15180	18220	21250	24290	30360	36430	42500
Width boiler...in.	36	36	36	36	36	42	42	42	48	48	54	54	60	66	72	72	78	84	84
Length boiler...in.	42	51	60	69	78	72	81	90	91	105	93	108	118	123	118	136	139	132	150
Height overall...in.	74	74	74	74	74	85	85	85	87	87	98	98	106	112	121	121	122½	136	136
Height waterline...in.	64½	64½	64½	64½	64½	71	71	71	71½	71½	83½	83½	83½	94	101	101	102	114	114
Weight (Hand fired)...lbs.	3000	3400	3800	4300	4800	5300	5800	6300	7200	8100	9400	10600	12500	14400	16100	17900	21200	24400	27500
(Mech. fired)...lbs.	2500	2900	3300	3700	4100	4600	5000	5400	6100	6900	8000	9100	10700	12300	13800	15400	18100	20900	23400

*100-A Series, for anthracite coal; 100-B Series, smokeless for bituminous coal; 100-O Series, for oil, gas or stoker.

STANDARDIZED 900 SERIES—BISON COMPACT HIGH FIREBOX WELDED BOILERS—15-LB. W. P.

Boiler No.*	950	952	954	956	958	960	962	964	966	968	970	972	974	976	978	980	982	984	986
Steam rating (Hand fired)...sq. ft.	1800	2200	2600	3000	3500	4000	4500	5000	6000	7000	8500	10000	12500	15000	17500	20000	25000	30000	35000
(Mech. fired)...sq. ft.	2190	2680	3160	3650	4250	4860	5470	6080	7290	8500	10330	12150	15180	18220	21250	24290	30360	36430	42500
Width boiler...in.	36	36	36	36	36	42	42	42	48	48	54	54	60	66	72	72	78	84	84
Length boiler...in.	42	51	60	69	78	72	81	90	91	105	93	108	118	116	118	136	139	132	150
Height overall...in.	78	78	78	78	78	90	90	90	95	95	108	108	117	125	134	134	142	162	162
Height waterline...in.	68¾	68¾	68¾	68¾	68¾	76	76	76	80	80	91	91	100½	105	113	113	121	140	140
Weight (Hand fired)...lbs.	3200	3600	4000	4500	5100	5600	6200	6700	7800	8800	9200	11500	13600	14700	16600	19500	23400	26700	30200
(Mech. fired)...lbs.	2700	3100	3500	3900	4400	4900	5400	5800	6700	7600	8800	10000	11800	13600	15300	17000	20100	23200	26100

*900-A Series, for coal; 900-O Series, for oil, gas or stoker.

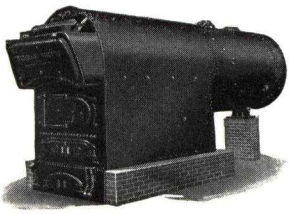


400 Series

400 SERIES—BISONETTE COMPACT WELDED BOILERS—15-LB. W. P.

Boiler No.*	401	403	405	407	409	411	413	415	417	419	421
Steam rating (Hand fired) sq. ft.	760	840	1000	1230	1370	1600	1820	1960	2240	2590	2860
(Mech. fired) sq. ft.	920	1020	1210	1490	1660	1940	2210	2380	2720	3140	3400
Width boiler...in.	26½	26½	26½	26½	26½	29½	29½	29½	29½	29½	29½
Length boiler...in.	55	57	61	69	75	64	70	76	82	94	100
Height Overall...in.	60	60	60	60	60	67½	67½	67½	67½	67½	67½
Height waterline...in.	48	48	48	48	48	55	55	55	55	55	55
Weight (Hand fired)...lbs.	2000	2160	2200	2450	2550	2800	3000	3100	3300	3650	3800
(Mech. fired)...lbs.	1890	1880	1960	2190	2290	2520	2670	2740	2900	3170	3280

*400-A Series, for coal; 400-O Series, for oil, gas or stoker.



500 Series
See table below

STANDARDIZED 500 SERIES—BISON FIREBOX UPDRAFT BOILERS—15-, 100-, 125-, 150-LB. W.P.

Boiler No.*	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580	582	584	586
Steam rating (Hand fired)...sq. ft.	1800	2200	2600	3000	3500	4000	4500	5000	6000	7000	8500	10000	12500	15000	17500	20000	25000	30000	35000
(Mech. fired)...sq. ft.	2190	2680	3160	3650	4250	4860	5470	6080	7290	8500	10330	12150	15180	18220	21250	24290	30360	36430	42500
Width boiler...in.	36	36	36	42	42	42	48	48	54	54	60	60	66	66	72	78	78	84	84
Length boiler...ft.-in.	6-9	8-0	9-6	7-8	8-8	9-8	8-11	9-8	8-10	10-1	11-4	12-10	12-8	14-6	14-0	14-3	17-0	17-5	19-5
Height overall...in.	73	73	73	82	82	82	86	86	93	93	100	100	107	107	113	116	116	125	125
Height waterline...in.	65	65	65	71	71	71	75	75	81	81	87	87	91	91	94	100	100	107	107
Weight (Hand fired)...lbs.	3900	4500	5000	5500	6100	6700	7300	7900	9000	10000	11500	13000	15200	17300	19300	21200	25000	28400	31700
(Mech. fired)...lbs.	3500	3900	4400	4900	5500	6100	6600	7100	8100	9000	10400	11800	13700	15700	17600	19300	23000	26300	29400

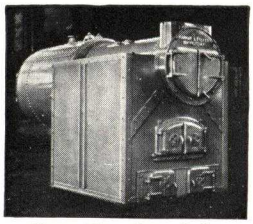
*500-W Series, welded for coal; 500-WO Series, welded for oil, gas or stoker; 500-R Series, riveted for coal; 500-RO Series, riveted for oil, gas or stoker.

STANDARDIZED 600 SERIES—BISON FIREBOX SMOKELESS DOWNDRAFT BOILERS—15-, 100-, 125-, 150-LB. W.P.

Boiler No.*	650	652	654	656	658	660	662	664	666	668	670	672	674	676	678	680	682	684	686
Steam rating (Hand fired)...sq. ft.	1800	2200	2600	3000	3500	4000	4500	5000	6000	7000	8500	10000	12500	15000	17500	20000	25000	30000	35000
(Mech. fired)...sq. ft.	2190	2680	3160	3650	4250	4860	5470	6080	7290	8500	10330	12150	15180	18220	21250	24290	30360	36430	42500
Width boiler...in.	36	36	36	42	42	42	48	48	54	54	60	60	66	66	72	78	78	84	84
Length boiler...ft.-in.	6-8	8-0	9-3	7-11	8-8	9-10	8-8	9-7	9-10	11-7	11-10	13-7	14-6	16-9	15-11	15-11	19-2	18-9	21-4
Height overall...in.	73	73	73	81	81	81	87	87	93	93	100	100	107	107	112½	116	116	125	125
Height waterline...in.	65	65	65	71	71	71	75	75	81	81	87	87	91	91	98	99	99	108	108
Weight (Hand fired)...lbs.	3600	4250	5050	5820	6800	7500	8100	8800	10000	11100	13600	15300	18000	20500	22900	25100	29500	33600	37500
(Mech. fired)...lbs.	3200	3650	4450	5220	6200	6900	7400	8000	9100	10100	12500	14100	16500	18900	21200	23200	27500	31500	35200

*600-W Series, welded for coal; 600-WO Series, welded for oil, gas or stoker; 600-R Series, riveted for coal; 600-RO Series, riveted for oil, gas or stoker.

BISON TWO-PASS BOILERS



Bison Two-Pass Boiler

The Bison Two-Pass Return Tubular Refractory-Lined Boiler is favored by engineers because it *eliminates water legs, flat sides and staybolts.* It is constructed to measure up to the high standards set by the profession to give unfailing service under all conditions. It has been designed to stand up under heavy loads, is dependable for long years of continuous and economical operation and will provide that surplus of power so often needed. It requires a minimum of space for installation and is a portable type. Each boiler will be found a *rapid steamer.*

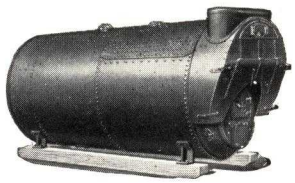
These boilers are built according to the A.S.M.E. Code for ratings from 25 to 250 hp. They are adaptable for coal and for oil, gas or stoker firing.

6000 SERIES—BISON TWO-PASS BOILERS—15-, 100-, 125-, 150-LB. W. P.

Boiler No.	6025	6030	6035	6040	6050	6060	6070	6075	6080	6090	6100	6115	6125	6150	6175	6200	6225	6250
Horsepower (as usually rated)	25	30	35	40	50	60	70	75	80	90	100	115	125	150	175	200	225	250
Heating surface.....sq. ft.	261	317	361	410	530	618	702	756	819	925	1041	1177	1275	1533	1794	2055	2282	2547
Width boiler.....ft.-in.	5-4	5-4	5-4	5-4	6-5	6-5	6-5	6-11	6-11	6-11	7-3	7-3	7-9	7-9	7-9	8-9	8-9	8-9
Length boiler.....ft.-in.	10-1	11-7	12-7	14-1	13-1	14-7	16-1	14-10	15-10	17-4	16-5	17-11	16-7	18-7	20-7	18-5	19-11	21-5
Height overall.....ft.-in.	7-11	7-11	7-11	7-11	8-9	8-9	8-9	9-7	9-7	9-7	9-11	9-11	10-2	10-2	10-2	11-9	11-9	11-9
Height waterline.....ft.-in.	6-8	6-8	6-8	6-8	7-2	7-2	7-2	7-10	7-10	7-10	7-11	7-11	8-3	8-3	8-3	9-4	9-4	9-4
Weight (Hand fired, 100 lbs.).lbs.	14025	14750	16500	18750	21100	23650	26050	28425	30350	32150	34075	36050	38300	44400	49600	54800	58300	61800
(Mech. fired, 100 lbs.)..lbs.	13400	14150	15800	17950	20200	22650	25050	27375	29225	30900	32700	34600	36800	42200	47700	52850	56150	59550

SCOTCH MARINE BOILERS

Scotch Marine Boilers are designed for installation where there is a limited amount of head room and where power and economy of operation are essential. They are most suitable for operation in plants which require only intermittent demands for steam. These boilers are *well-built* and will give all the service demanded of them when properly installed and operated.



F & T Scotch Marine Boiler

Scotch Boilers are built according to the A.S.M.E. Code of welded or riveted construction for 15 lbs. working pressure and for higher pressures.

Sizes are available from 6 to 325 hp. for either coal or oil, gas or stoker firing. Boilers 72 in. in diameter and larger are furnished with corrugated furnaces.

1000 SERIES—SCOTCH MARINE TYPE BOILERS—15,- 100-, 125-, 150-LB. W. P.

Boiler No.	1006	1012	1015	1020	1025	1030	1035	1040	1050	1060	1075	1090	1100	1125	1150	1175	1200	1225	1250	1275	1300	1325
Horsepower (as usually rated)	6	12	15	20	25	30	35	40	50	60	75	90	100	125	150	175	200	225	250	275	300	325
Heating surface.....sq. ft.	52	102	121	166	207	258	307	335	423	596	760	904	1004	1255	1506	1760	2022	2236	2508	2758	3012	3261
Width boiler.....in.	35	42	42	48	48	54	54	60	60	72	72	78	78	84	90	96	102	102	108	108	114	120
Length boiler.....ft.-in.	5-11	8-8	9-8	9-6	11-0	11-3	12-9	11-9	13-9	12-7	15-1	16-5	17-9	18-3	18-4	18-10	19-9	21-3	21-2	22-8	22-4	22-7
Height overall.....ft.-in.	5-4	6-5	6-5	6-11	6-11	7-9	7-9	8-3	8-3	7-7	7-7	8-1	8-1	8-8	9-3	9-9	10-3	10-3	10-9	10-9	11-3	11-9
Height waterline.....ft.-in.	3-6	3-9	3-9	4-0	4-0	4-8	4-8	4-11	4-11	5-7	5-7	5-10	5-10	6-6	7-1	7-4	7-8	7-8	8-4	8-4	8-7	9-0
Weight (Hand fired, 100 lbs.).....lbs.	3000	5100	5300	5800	6600	7900	9200	11000	13250	16250	19800	25000	26400	30000	33000	36000	42000	45000	46000	49000	50000	53000
(Mech. fired, 100 lbs.).....lbs.	2700	4600	4800	5200	6000	7200	8400	10100	12350	15200	17550	23500	24900	27300	30900	33750	39500	42350	43350	46200	47000	49850

CLASS I WELDED H.R.T. BOILERS

FARRAR & TREFTS now manufacture a *Horizontal Return Tubular Boiler of Class I Fusion Welded* construction, as well as a boiler of riveted construction, for high pressures. The X-Ray welded boiler is fast becoming the *"Modern"* H.R.T. Boiler. It is built in accordance with the A.S.M.E. Code and eliminates all riveted girth seams, which, in normal riveted construction, are exposed to the fire. The welded seams will remain tight under high pressures. A boiler of this construction will give long and steady service under continuous operation. It is built strong and well and can be depended upon to produce an even supply of steam power economically. An *F&T Class I Welded H.R.T. Boiler* is a *boiler of strength and quality.*

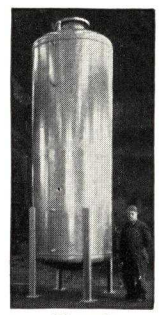
F & T Riveted H.R.T. Boiler

H.R.T. Boilers are designed for either coal or oil, gas or stoker firing in sizes from 12 to 300 hp. They can be furnished with various types of settings and supports.

CLASS I WELDED TANKS

Tanks of Class I Welded construction are now taking their places alongside riveted tanks. They are built strictly in accordance with the A.S.M.E. Code for almost any pressure and the X-Ray welded seams will remain tight under high pressure.

These tanks will stand up under hard usage for long years of continuous service.



Class I Welded Tank

8000 SERIES—HORIZONTAL RETURN TUBULAR BOILERS—15-, 100-, 125-, 150-LB. W. P.

Boiler No.	8012	8020	8030	8035	8045	8050	8060	8070	8080	8090	8100	8115	8125	8150	8175	8180	8200	8225	8250	8300
Horsepower (as usually rated)	12	20	30	35	45	50	60	70	80	90	100	115	125	150	175	180	200	225	250	300
Width boiler.....in.	30	36	36	42	48	48	54	54	60	60	66	66	72	72	72	78	78	84	84	90
Length shell.....ft.	8	10	12	12	12	14	14	16	16	18	16	18	16	18	20	18	20	18	20	20
Setting height floor to shell.....in.	56	58	58	60	62	62	66	66	66	66	66	66	66	66	66	72	72	72	72	72
Overall height.....ft.-in.	8-4	9-0	9-0	9-8	10-4	10-4	11-2	11-2	11-8	11-8	12-2	12-2	12-8	12-8	12-8	13-8	13-8	14-2	14-2	14-8
Weight (bare boiler, 100 lbs.).....lbs.	2500	3100	3500	5000	6300	6900	8700	9700	12000	13300	13600	15100	16800	18500	20200	23400	25400	27400	30000	34000

CRANE CO.

Boilers, Radiators, Valves, Fittings and Heating Materials

CRANE CO. GENERAL OFFICES
836 South Michigan Avenue, CHICAGO, ILL.
BRANCHES AND SALES OFFICES IN 160 CITIES

For page on Crane Plumbing Fixtures, see File Index

Crane-Efficient Heating Equipment

Crane offers a single source of supply for a full line of heating equipment for both residential and commercial buildings. The Crane line includes—

1. Sectional and round cast-iron boilers, jacketed or unjacketed, for hot water, steam, vacuum, and vapor heating—to burn coal, coke, gas or oil—in a broad range of sizes.

2. Smokeless type cast-iron boilers for soft coals. A smokeless attachment that may be installed in Crane boilers already in service without removing piping or dismantling boiler.

3. Direct, tube type cast-iron radiators with or without patented shields in all standard sizes and types—also legless, bathroom, hospital and wall types.

4. Cast-iron convector radiators with a variety of attractively designed enclosures.

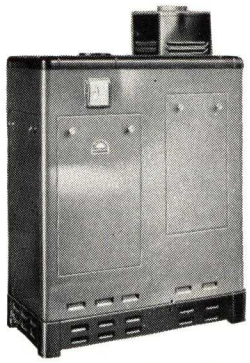
5. Unit heaters.

6. Air conditioning units for residential installations.

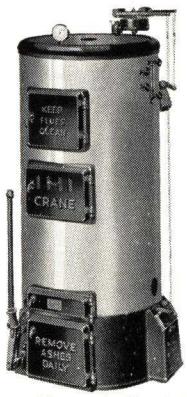
7. Valves and fittings — the largest and most complete line in the world.

Use Your Crane Architect's Catalog

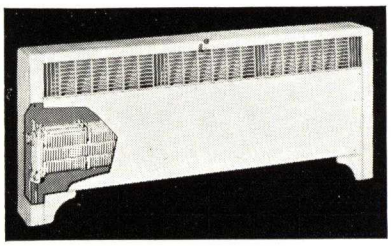
A few typical Crane boilers are illustrated here. Please refer to your Crane Architect's Catalog No. 675C for complete detailed specifications on all boiler models and accessories. This volume of more than 200 loose-leaf pages offers comprehensive and authoritative heating data, including capacity ratings and physical dimensions needed for specification writing. It also includes complete information on Crane Plumbing styled for beauty and utility.

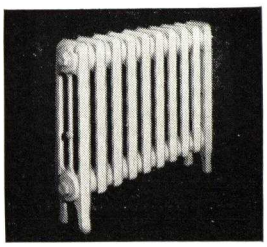


Basmor Gas-Fired Boiler—Equipped with the simple Basmor gas-saving burner, it is immune to backfiring. Operates quietly with utmost efficiency. A compact unit—completely insulated to hold its heat—in attractive jacket. Available in Standard and Deluxe models.



Crane Round Coal Boiler—With its staggered flue travel it is a worthy companion to the sectional boiler. It is available in a more limited number of sizes sufficient to meet the needs of the small to medium-sized home. Can be furnished with or without insulated jacket.

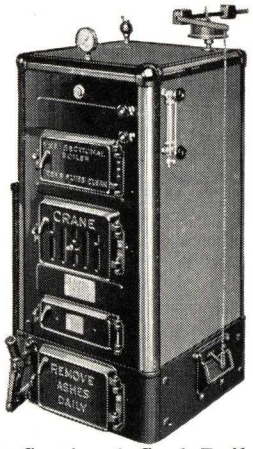




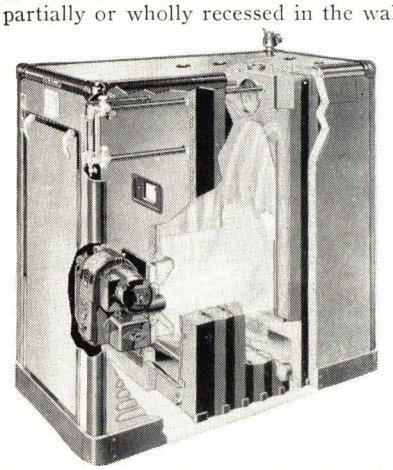
Crane Radiators—Are conservatively rated. They are available in a wide range of sizes to meet a variety of structural demands. They can be equipped with Crane patented invisible shields which direct the heat to the "living zone" where heat is wanted.

Crane Convector Radiators—Meet the demands of modern treatment in interior decoration with no loss of heating efficiency. They can be partially or wholly recessed in the wall.

Crane Fin-type Oil Burning Boiler—The most recent addition to the Crane Boiler family—is designed specially for burning oil. Integrally cast fins in the flue way increase the transmission of heat to the boiler water. Oil burner and controls are mounted at the rear of the boiler, saving space and labor. This boiler is competitively priced for use with any gun-type oil burner. Furnished with Deluxe or Plain insulated two-tone green jacket. The Deluxe jacket completely encloses boiler and oil burner.

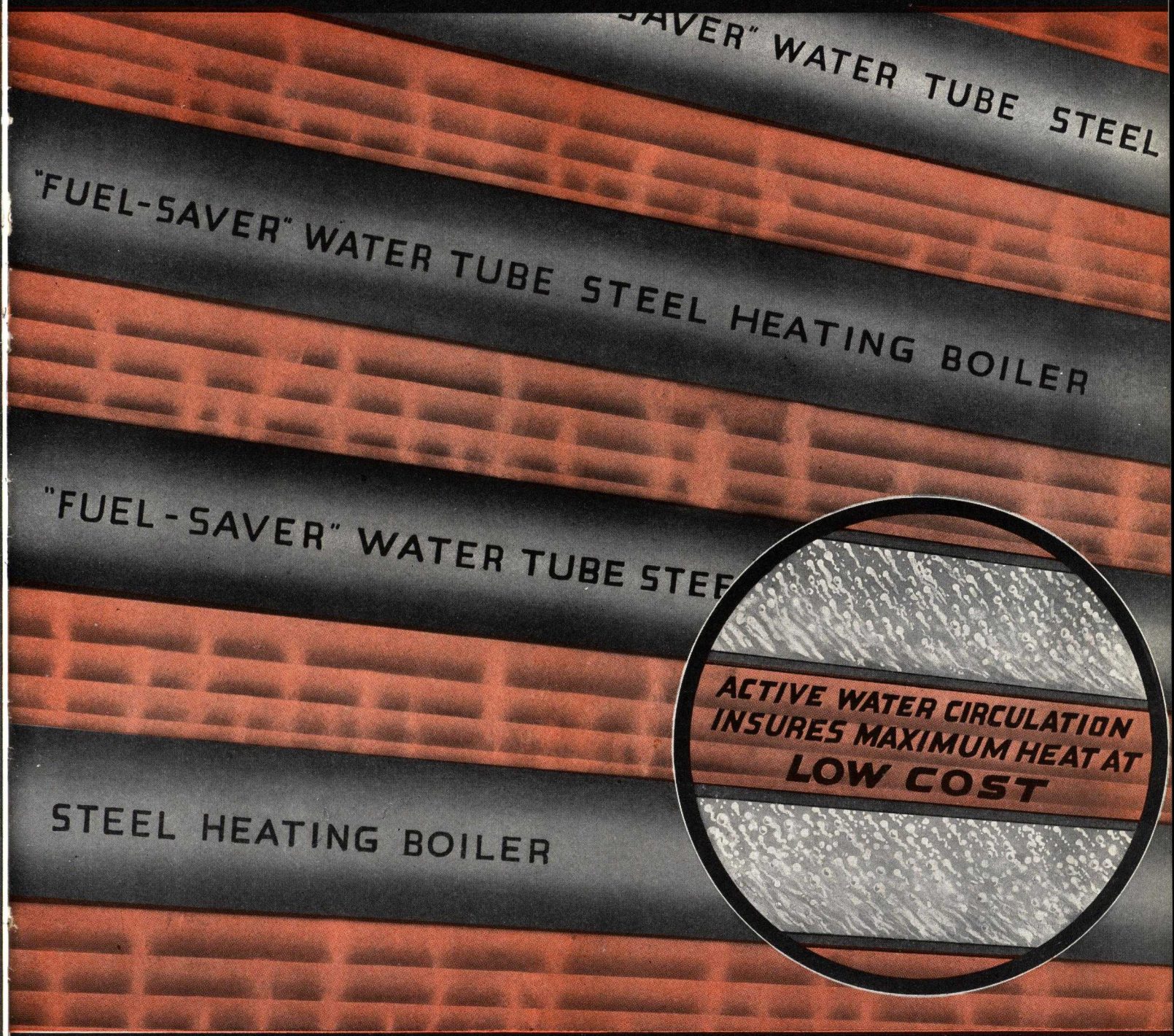


Crane Sectional Coal Boiler—Special design provides increased fire travel and maximum contact of water with the heating surfaces, thus making possible the unusually high efficiency of this boiler. Patented water baffle and greater ceiling heating surface mean greater fuel economy. Made in a wide range of sizes, with or without attractively styled insulated jacket.



Crane Sustained Heat Oil Burning Boiler—A combination of a boiler and an oil burner, designed to work together. The boiler is unique in design, maintaining high efficiency even under intermittent operation. Oil Burner is simple, dependable, contributing its share to the desired result—a fuel-saving, money-saving, boiler-burner unit. Furnished with Deluxe or Plain insulated two-tone green jacket. The Deluxe Jacket completely encloses boiler and oil burner.

INTERNATIONAL "FUEL-SAVER" WATER TUBE STEEL HEATING BOILERS



OIL-BURNING
HAND-FIRED COAL
STOKER-FIRING

WATER TUBE BOILERS FOR SMALL OR LARGE CAPACITY HEATING PLANTS for Residences, Public Commercial, Institutional, and Industrial Buildings

THE INTERNATIONAL BOILER WORKS CO.

EAST STROUDSBURG PENNSYLVANIA, U. S. A.

NOW the savings of Water Tube Steel Boilers are available for LOW PRESSURE HEATING PLANTS

THE INTERNATIONAL BOILER WORKS COMPANY **ESTABLISHED 1886**

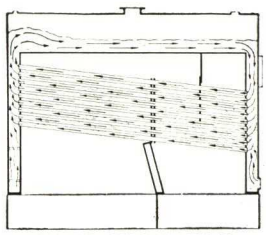
Engineers have long accepted the *water tube* type of boiler as the most efficient for industrial and marine use, yet, it remained for the International Boiler Works Company to prove with its Water Tube "Fuel-Saver" that the same quick-steaming and economy demanded by industry could be reproduced in a steel boiler for heating purposes and that such a boiler could be built and sold at a price decidedly in line with less up-to-date heating boilers.

The superiority of "Fuel-Saver" Water Tube Boiler performance is best indicated by their remarkably quick pickup and fuel economy, which is comparable to the efficiency required of the most modern steam generating plants.

Four Reasons Why INTERNATIONAL WATER TUBE Steel Boilers are "*FUEL-SAVERS*"

1 QUICKER HEATING —Because of More Active Water Circulation

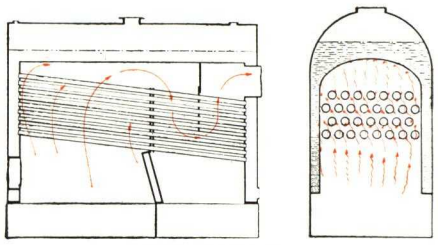
The drawing to the right illustrates the exceptionally active circulation of water in "Fuel-Saver" Water Tube Steel Boilers. Instead of lying sluggishly in a large mass, the water travels in a natural ring circuit formed by the slanting water tubes, the front and rear headers and the water over the crown. The faster the circulation, the more heat is absorbed and carried into the heating system. As the water passes through the water tubes, it is divided into small streams, greatly facilitating the quick absorption of heat.



WATER CIRCULATION

2 INCREASED HEAT ABSORPTION —Due to Effective Distribution of Heated Gases

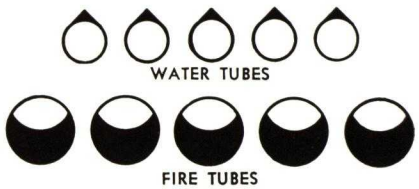
In the drawings to the right note how the hot gases in a "Fuel-Saver" pass directly upward into the banks of tubes and are broken up into innumerable small currents by the successive layers of tubes. This breaking-up action forces every particle of heat into close contact with the tube heating surfaces where it is then rapidly absorbed. Note also that most of the heating surface is located above and directly in the path of the heated gases. Such surface is known as "prime" heating surface and is an important measure of the economy of a boiler.



HEAT DISTRIBUTION

3 EASY TO KEEP CLEAN

In the drawing to the right below, the upper layer of tubes shows the maximum amount of soot that can accumulate on the surface of water tubes. In contrast, note how the soot can gather on the inside of fire tubes and reduce the draft and heat absorbing surfaces, as shown in the lower row of tubes.



WATER TUBES

FIRE TUBES

4 GREATER STRENGTH —For Long Life—Dependable Service and Heavy Duty

"Fuel-Saver" Boilers are constructed of open hearth steel plates welded into a solid unit by the improved "Shielded-Arc" method. Every seam and joint is tested under pressure and will not open or leak under the most severe strains caused by expansion or contraction. These boilers are built in conformity with, or excess of, requirements of A.S.M.E. code for Low Pressure heating boilers.

The economical features of the International Water Tube Boiler mentioned above, combine to justify the name "Fuel-Saver," because they result in the absorption of more heat units into the heating system and less waste of heat through the chimney.

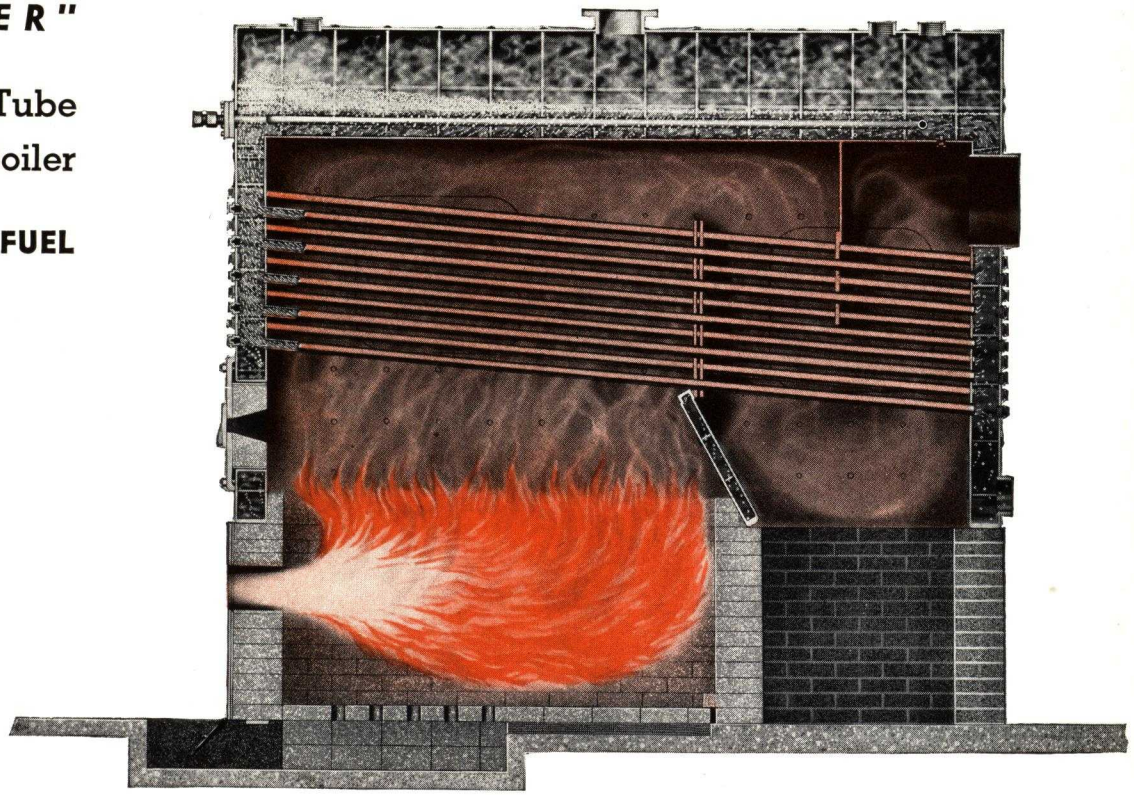
SAVE WITH THE INTERNATIONAL "FUEL-SAVER"

Quick Pick-up of *"FUEL-SAVER"* Boilers is Highly Effective in OIL FIRING

"FUEL-SAVER"

Type "C" Water Tube Steel Heating Boiler

FOR OIL OR GAS FUEL



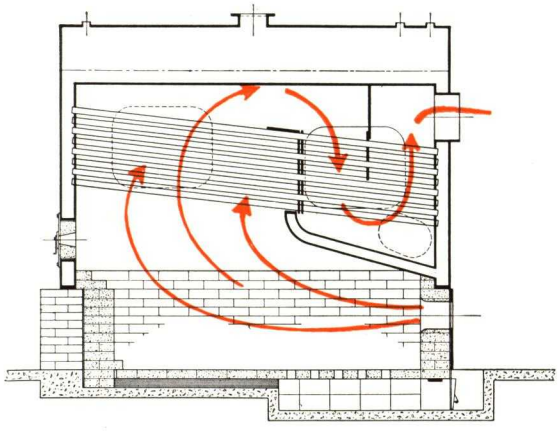
FOR

OFFICE and APARTMENT BUILDINGS
SCHOOLS
THEATRES
HOTELS
INSTITUTIONS
INDUSTRIAL PLANTS
AND SIMILAR REQUIREMENTS

REAR-FIRED "FUEL-SAVER"

Type C "Fuel-Saver" for oil-firing can be furnished for rear-firing as shown below. Note extra long combustion chamber and possibility for provision of coal grates at rear of combustion chamber for incineration or emergency coal-firing.

The rear-fired boiler also provides a front smoke outlet with three gas passes where location of stack or breeching requires.



FRONT FIRED "FUEL-SAVER"

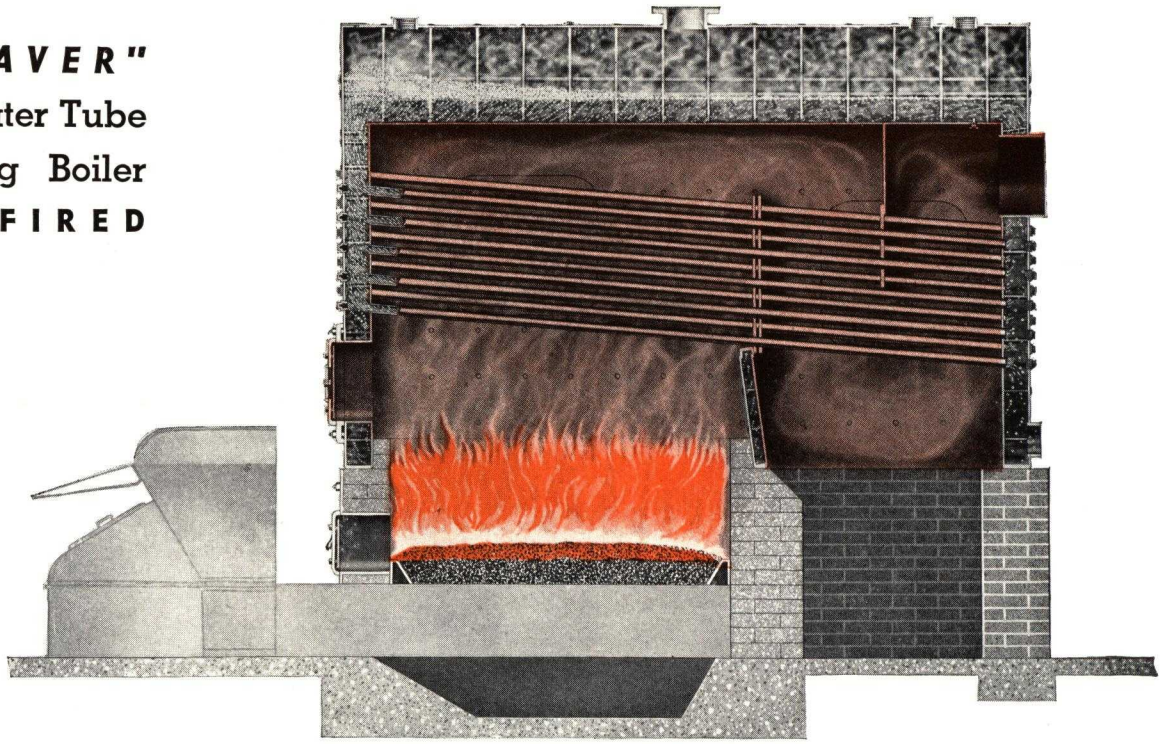
The intense heat generated by the oil flame and the intermittent automatic firing necessitate a type of construction providing exceptionally rapid pickup. The outstanding superiority of Water Tube Boilers in this respect makes The International "Fuel-Saver" the ideal boiler for oil.

The advent of oil fired heating systems for low-pressure heating increased the demand for the water tube boiler in this field. Older methods of design and construction leave much to be desired in automatic firing of heating boilers. Intermittent on and off periods in oil-heating call for quick action on the part of the boiler. Water tube boilers with their active water circulation, quickly respond to the heat of the oil burner when it comes on after an idle period. Thus room temperatures are maintained within closer limits than in other types of boilers, where the response is slower because of less active water circulation.

The high quality of construction employed in making "Fuel-Savers" shows to its best advantage in oil-firing. Intermittent firing, with its quick changes in internal boiler temperatures, puts a severe stress on the materials and workmanship incorporated in a boiler. The excellent performance of "Fuel-Savers" and the extremely low insurance rates obtainable are a strong testimonial to the soundness of their construction. Type C Oil-Fired Boilers can be furnished for either front or rear firing.

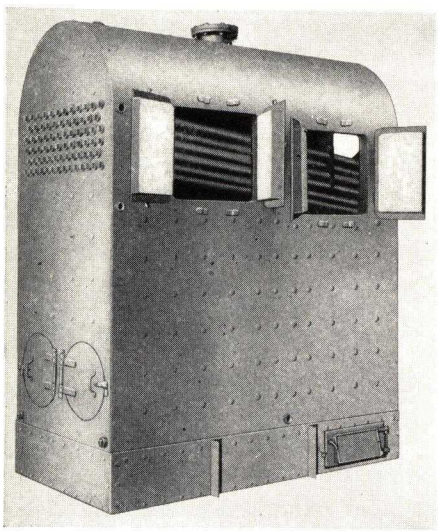
"FUEL-SAVERS" Synchronize STOKER FIRING with Outstanding Success

"FUEL-SAVER" Type "C" Water Tube Steel Heating Boiler STOKER FIRED



At Right
Section Showing
Stoker Fired
"Fuel-Saver"
Boiler

HIGH FIREBOX BOILER FOR MECHANICAL FIRING



Extended Water Leg or High Fire Box Boiler can also be furnished when required as shown above.

Increased combustion volume and proper height to first row of water tubes is accomplished by addition of actual heating surface in form of extended water legs instead of by brick setting. An extra charge for this construction is made over standard type "C" boiler.

The International "FUEL-SAVER" because of its water tube design is well qualified to utilize the extreme flexibility of stoker operation.

The Modern stoker is capable of producing in furnace of heating boiler the same high combustion rates and efficiencies that are demanded in power plant practice, but for maximum heating economy the heat thus liberated must be absorbed by the boiler at correspondingly high rates and efficiencies.

The high fire box temperatures and heat release normal to stoker operation are readily absorbed by the water tube heating surface of International "FUEL-SAVER" boilers. The effective distribution of the products of combustion in contact with the water tube heating surface and the rapid and positive circulation of boiler water combine to carry the heat units away from the fire at accelerated speed as the combustion rate increases.

The stoker capacity for high combustion rates is especially valuable in connection with "FUEL-SAVER" as water tube boilers operate at maximum efficiency when carrying loads considerably in excess of their rating. Overloads will not cause priming.

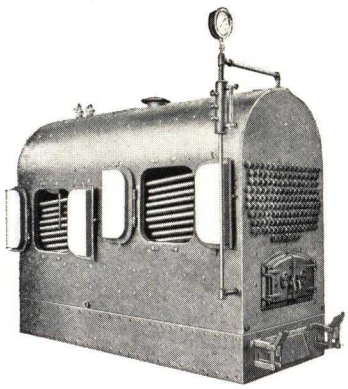
The water tube heating surface of International "FUEL-SAVER" is ideally located in relation to radiant heat of the fuel bed on stoker retort, approximately 60 percent of this heating surface lying directly over the fire in the form of water tubes which are the most effective heat absorbing surface. The crown sheet, which is the least effective, is furthest removed from the fire and is thus fully protected.

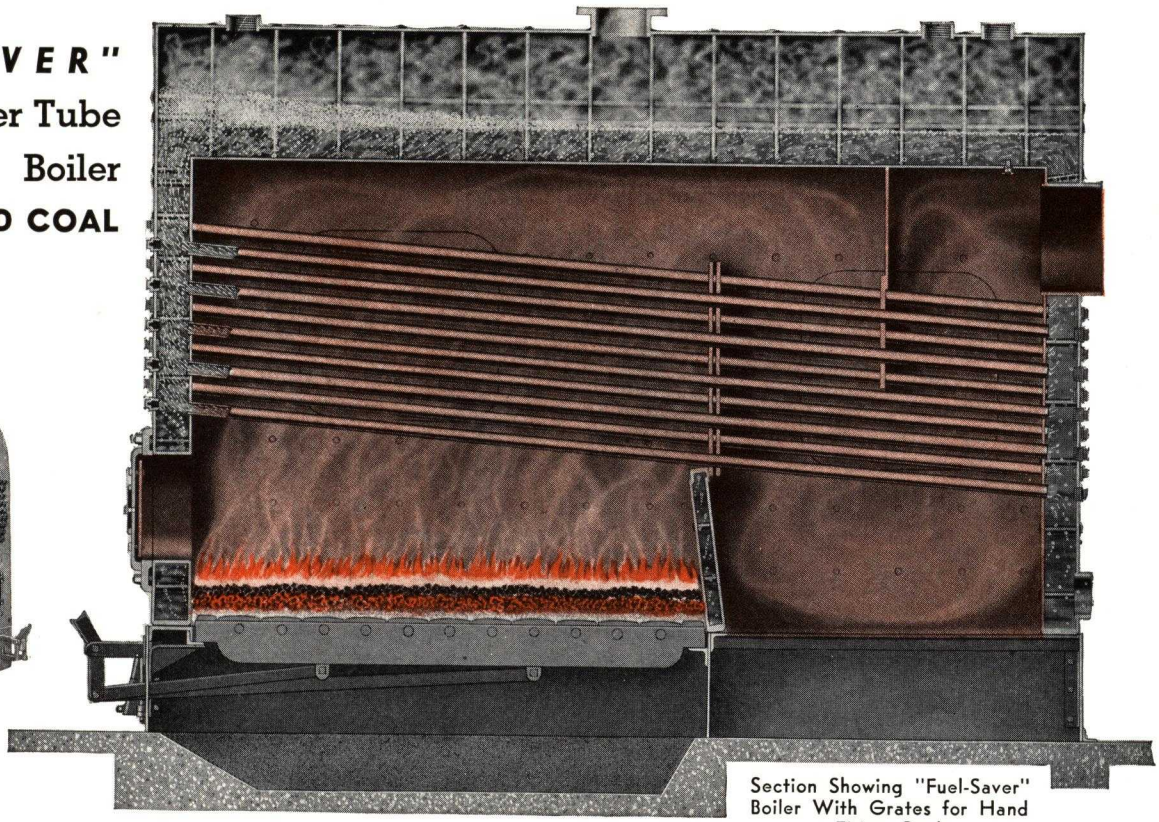
"FUEL-SAVER" boilers are virtually self cleaning due to the fact that water tube heating surface and vertical baffling presents minimum space for fly ash and soot collection. This is an important factor in stoker firing as the boiler will operate for longer periods without excessive loss in efficiency or draft.

SAVE WITH THE INTERNATIONAL "FUEL-SAVER"

INTERNATIONAL *"FUEL-SAVER"* Gets the utmost in B.T.U.s from COAL FIRING

"FUEL-SAVER" Type "C" Water Tube Steel Heating Boiler FOR HAND-FIRED COAL





Section Showing "Fuel-Saver" Boiler With Grates for Hand Firing Coal

The steady, even heat of solid fuel is generated to best advantage in a "Fuel-Saver" Type C Coal-Burning Boiler.

Equipped with vertical baffles, the "Fuel-Saver" does not accumulate dirt, ashes or soot. Even the tube surfaces afford little foothold because of their roundness and the sweeping action of the draft. All ash falls to the base of the boiler where it can readily be removed, thus preventing the clogging up of the boiler draft areas.

The unusually large combustion space and the long three-pass draft travel of all "Fuel-Saver" Water Tube Steel Boilers, combined with the low draft loss through the boiler, insure exceptionally complete combustion of the entire input of fuel. The burning fuel requires plenty of combustion and draft space for best results and these are found nowhere in better proportion than in the "Fuel-Saver." The low draft loss in the Type C Boiler also permits maintenance of satisfactory firing conditions with minimum attention.

The grates and shaking mechanism are made of best materials and are of extra heavy and durable construction. Grate bars can be provided for burning any type of solid fuel and are shipped completely assembled in bases.

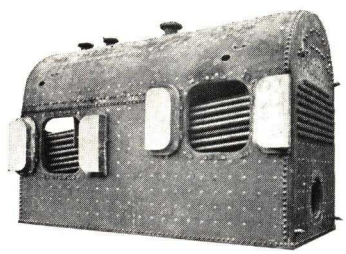
"FUEL-SAVER" For High Pressure Service

Type "CR" Riveted for 100, 125, 150 lbs. W.P. A.S.M.E. ST'D.

For installations requiring high pressure steam such as Hospitals, Laundries, Hotels, and Industrial Plants the type CR boilers offer the quick steaming and high fuel economy of the modern water tube design.

The boiler is of heavy riveted construction and meets all of the requirements of A.S.M.E. Code.

Type "CR" is manufactured in a complete range of sizes from 5 to 250 horsepower.

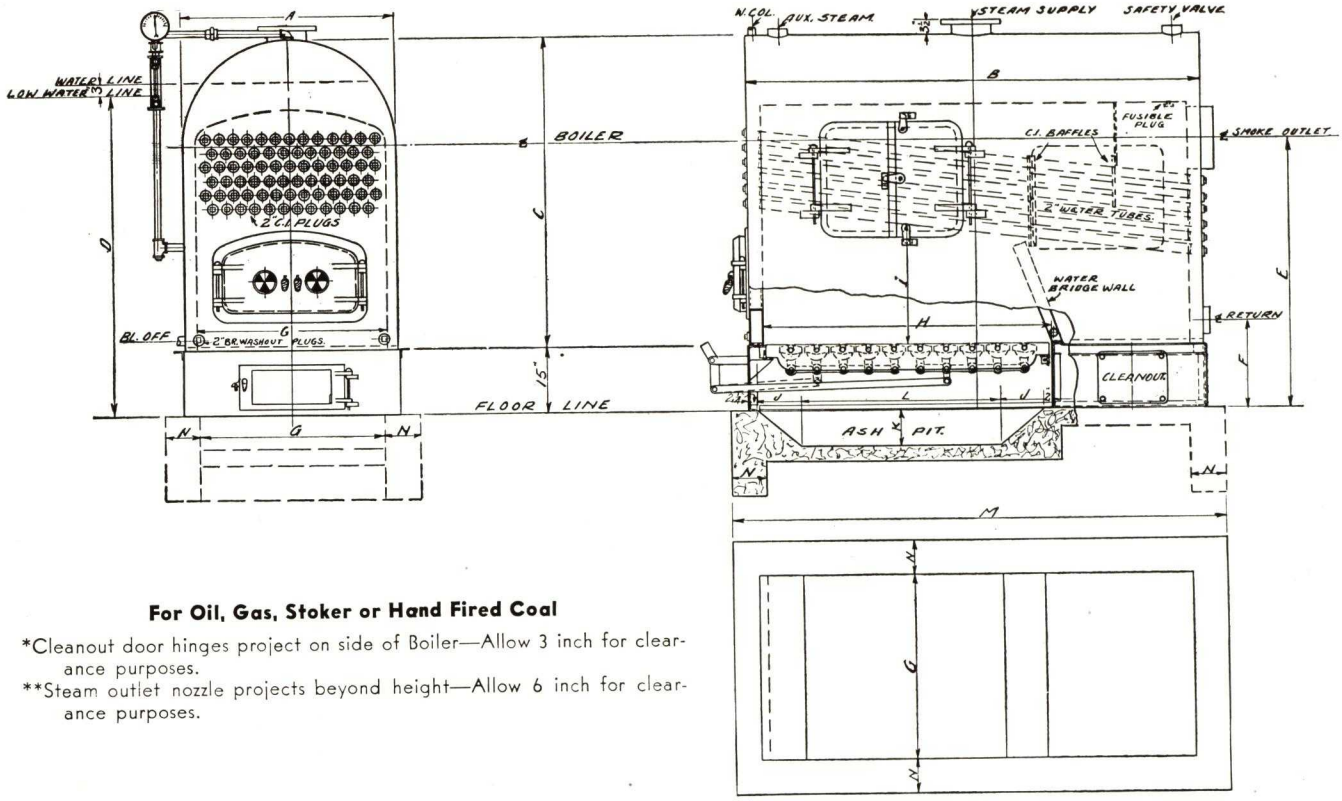


Catalog on Request

THE INTERNATIONAL BOILER WORKS COMPANY

CAPACITIES and DIMENSIONS FOR "FUEL-SAVER"

Type "C"—Series 500 Welded Steel Heating Boilers



For Oil, Gas, Stoker or Hand Fired Coal

*Cleanout door hinges project on side of Boiler—Allow 3 inch for clearance purposes.

**Steam outlet nozzle projects beyond height—Allow 6 inch for clearance purposes.

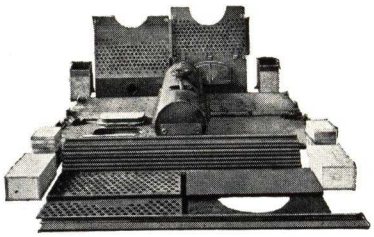
Boiler Number		521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538
Steam rating—mech. fired	sq.ft.	2680	3160	3650	4250	4860	5470	6080	7290	8500	10330	12150	15180	18220	21250	24290	30360	36430	42500
Steam rating—hand fired	sq.ft.	2200	2600	3000	3500	4000	4500	5000	6000	7000	8500	10000	12500	15000	17500	20000	25000	30000	35000
Heating surface—water tube	sq.ft.	158	186	215	250	286	322	358	429	500	608	715	893	1072	1250	1429	1786	2143	2500
Grate area	sq.ft.	9.4	9.4	10.3	11.6	12.3	13.8	15.4	16.9	19.7	20.4	22.4	25.2	29.8	30.5	33	39.1	42.5	46.1
A—Boiler width*	in.	30	30	36	36	43	43	43	43	49	55	55	61	61	68	68	74	80	86
B—Boiler length	ft.in.	5-9	5-9	5-9	6-9	6-9	7-9	7-9	8-9	8-9	8-9	9-9	9-11	10-11	10-9	12-9	13-9	14-9	15-9
C—Boiler only, height**	ft.in.	4-5½	4-8½	5-0	5-0	5-6½	5-6½	5-9½	5-9½	6-0	6-9	6-9	7-9½	7-9½	8-5	8-5	8-9	9-1	9-3
D—Water column height	ft in.	5-0	5-3	5-6	5-6	5-11	5-11	6-2	6-2	6-2½	6-9½	6-9½	7-8	7-8	8-2	8-2	8-4	8-7	8-9
E—Smoke outlet height	ft.in	4-3	4-6	4-8	4-8	5-0	4-10¾	5-1¾	5-1¾	5-2½	5-8½	5-8½	6-5½	6-5½	6-10	6-10	6-10½	7-0	7-0½
F—Return height	in	19	19	19	19	19	19	19	20	20	20	20	20	20	20	20	21	21	21
G—Comb. chamber and pit width	in	24⅞	24⅞	30¾	30¾	36¾	36¾	36¾	36¾	42¾	48¾	48¾	54½	54½	60½	60½	66½	72⅜	78¼
H—Comb. chamber length	in.	54½	54½	48½	54½	48½	54½	60½	66½	66½	60½	66½	66½	78½	72½	78½	84½	84½	84½
I—Tube ht. comb. cham. ftont	in.	25¼	25	26½	26½	28¼	28¼	29¼	29¼	30½	35	35	36	36	38	38	40	41	42¼
J—Ash pit taper	in.	8	8	8	8	8	8	8	8	8	10	10	10	10	10	10	10	10	10
K—Ash pit depth	in.	6	6	6	6	6	6	6	6	6	8	8	8	8	8	8	8	8	8
L—Ash pit length	ft.in.	3-2	2-8	3-2	2-8	3-2	3-8	4-2	3-8	4-2	3-10½	3-11⅝	4-5⅝	4-6⅝	5-0⅝	5-0⅝	5-0¾	5-6¾	5-6¾
M—Foundation length	ft.in.	6-6	6-6	6-6	7-6	7-6	8-6	8-6	9-6	9-6	9-6	10-6	11-0	12-0	11-10	13-10	14-10	15-10	16-10
N—Foundation thickness	in.	8	8	8	8	8	8	8	8	8	8	8	12	12	12	12	12	12	12
Disengagement area	sq ft.	12.4	12.4	14.3	16.8	20	23	23	28	30.4	35	38	43.4	48.5	52.4	57.4	74	84.3	94.8
Water content	gal.	116	128	167	190	228	252	262	300	315	458	480	615	740	875	950	1215	1405	1555
Steam supply size	in.	6	6	6	6	6	6	6	8	8	8	8	8	8	8	8	10	10	10
Return size	in.	4	4	4	4	4	4	4	5	5	5	5	5	5	5	5	6	6	6
Number of safety valves		1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
Safety valve size	in.	2	2	2	2	2	2	2½	2½	3	3	3	2	2½	2½	2½	3	3	3
Fire door size	in.	11x24	11x24	11x24	11x24	11x24	11x24	11x24	11x24	11x32	11x32	11x32	16x30	16x30	16x30	16x30	16x30	2-16x24	2-16x24
Cleanouts number		1	1	1	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3
Cleanout size	in.	18x30	18x30	18x30	18x24	18x24	18x30	18x30	18x30	24x30	24x30	24x30	30x30	30x30	30x30	30x30	30x30	30x36	30x36
Smoke outlet size	in.	8x17	8x20	10x20	10x20	12x22	12x22	14x22	14x22	14x28	14x36	14x36	16x36	16x39	18x42	18x48	20x54	20x60	22x66
Smoke outlet area	sq in.	122	146	178	178	233	233	266	266	350	462	462	521	569	686	794	994	1114	1348
Breeching diameter, one boiler	in.	17	18	18	19	20	21	22	23	24	26	28	30	31	33	35	39	41	43
Stack diameter, one boiler	in.	15	16	16	17	18	19	20	21	22	24	26	28	29	31	33	36	38	40
Minimum height of stack, one boiler	ft.	45	50	50	55	55	55	60	60	65	65	70	70	75	75	80	95	95	110
Breeching diameter, two boilers	in.	23	24	24	25	26	27	28	30	31	34	36	40	41	44	47	50	54	56
Stack diameter, two boilers	in.	21	22	22	23	24	25	26	28	29	32	34	37	38	41	44	47	50	53
Minimum height stack, two boilers	ft.	55	60	60	65	65	65	70	70	75	75	80	80	85	85	90	105	105	120
Covering surface	sq.ft.	80	83	95	107	125	139	143	156	171	197	207	245	268	305	325	390	444	490
Weight complete, approximately	lbs.	3885	4085	4850	5425	6235	6900	7175	8200	9360	10580	11625	15050	16610	18885	21450	25420	30620	34760
Furnace volume	cu.ft.	15.9	15.9	19	22	24	27.5	31.8	35.8	42.6	51	54.2	64.4	76.6	84.7	90	111.1	128.6	165.5

"FUEL-SAVER" Type KD for Renovation and Replacement in Existing Buildings with Small Openings

Type "KD"

KNOCK DOWN

FOR OIL, HAND - FIRED COAL AND STOKER FIRING



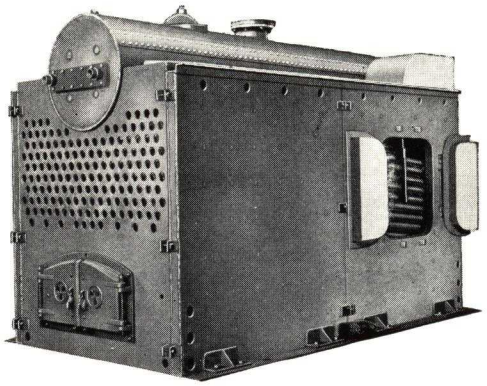
TYPE "KD" BOILER COMPLETELY KNOCKED DOWN AS FOR SHIPMENT

Eliminates Costly Cutting and Patching of Building Walls

The Type KD Steel Water Tube Boiler was designed to meet the growing need for a boiler that would heat large buildings, where there is no way of getting a one-piece steel boiler in the building without excessive cutting and patching. It is shipped in parts and erected in the boiler room.

Erected in Boiler Room by Competent Boiler Makers

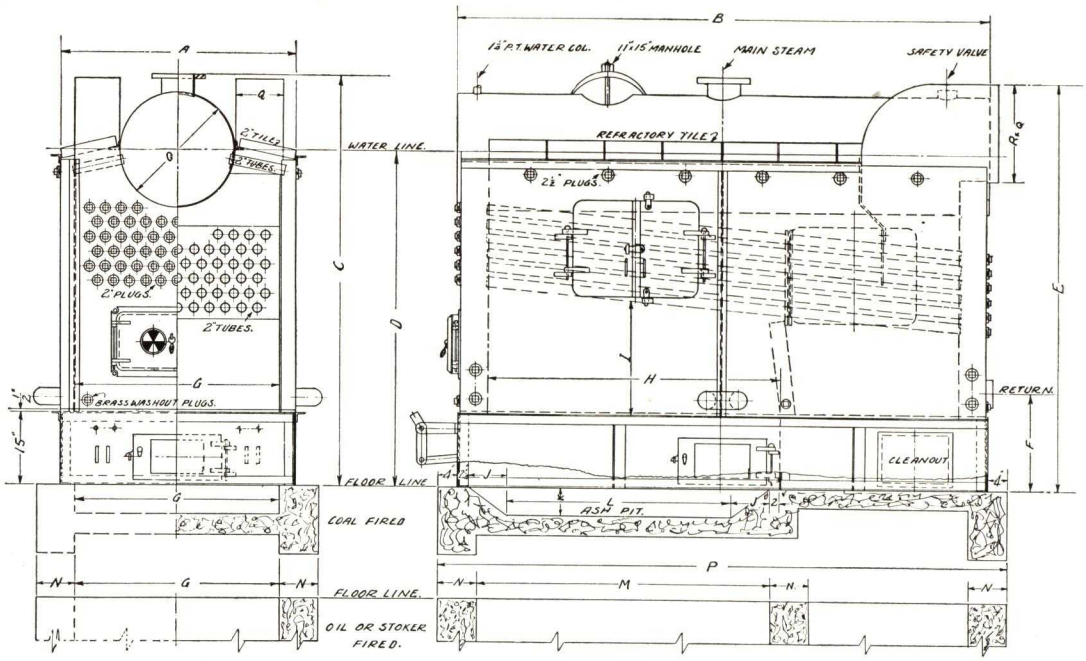
All work is done by our own boiler makers or by local boiler makers who have satisfied us that they are as competent as our men, for we accept full responsibility for the boiler erection work. In the knocked down condition the parts of even a 300 horse power Type KD boiler may be taken through an ordinary boiler room door or down an ordinary fire passage in a basement.



It Possesses the Same Features of Economy and Other Advantages as the Type C

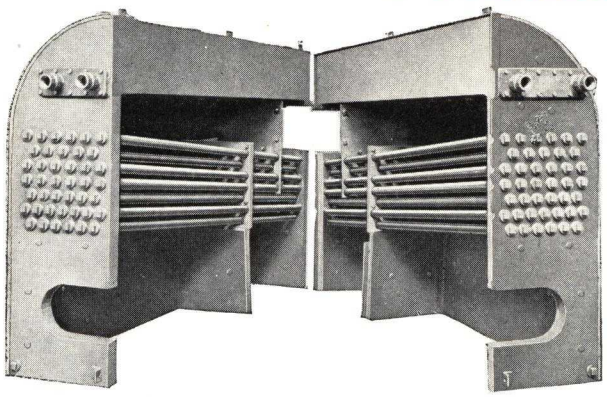
The boiler is set up and when turned over to the heating contractor for connection, is a permanent installation and carries the same guarantee as all our other boilers. Like the Type C Boiler, it is of the latest water tube design and the same rugged construction throughout. The Type KD Boiler combines the same features of water tube economy as the Type C, with the same quick steaming qualities and differs only in that it is so designed that it can be shipped in parts and erected on the job, thereby effecting substantial savings in renovation and replacement work.

DIMENSIONS and CAPACITIES of *"FUEL-SAVER"* TYPE "KD" BOILER



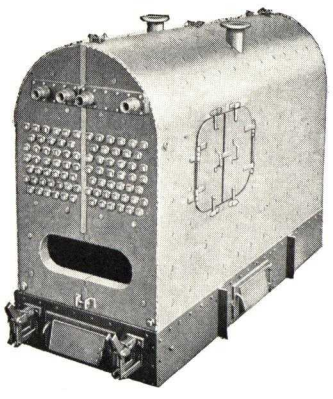
Boiler Number KD	30	40	50	60	70	80	90	100	120	140	160	180	200	250	300
Steam rating—mech. fired sq. ft.	5850	7630	9640	11420	13190	15160	17150	18970	22490	26380	30720	34030	37980	47410	56470
Steam rating—hand fired sq. ft.	4810	6280	7940	9410	10860	12490	14125	15625	18520	21730	25300	28030	31280	39050	46510
Heating surface—water tube sq. ft.	344	449	567	672	776	892	1009	1116	1323	1552	1807	2002	2234	2789	3322
Grate area sq. ft.	15.75	17.5	20	22	24.75	27	29.25	30	32.5	35.75	38.5	42	45	49	60
Combustion volume cu. ft.	31	34.4	43.5	46.9	53.7	60.8	80.1	72.6	78	101.7	111.4	131.7	150.6	173.9	196.3
A—Boiler width ft. in.	4'-1¼"	4'-1¼"	4'-7¼"	4'-7¼"	5'-1¼"	5'-1¼"	5'-1¼"	5'-7¼"	5'-7¼"	6'-1¼"	6'-1¼"	6'-7¼"	6'-7¼"	7'-7¼"	8'-7¼"
B—Boiler length ft. in.	8'-3¼"	9'-2¼"	10'-0"	10'-0"	10'-2¼"	11'-0¼"	11'-10¼"	10'-10¼"	12'-10¼"	13'-10¼"	14'-10¼"	14'-10"	15'-9¾"	15'-10"	15'-10"
C—Hght. to top of steam outlet ft. in.	6'-9½"	7'-0½"	7'-9½"	8'-0½"	8'-0½"	8'-3½"	8'-9½"	8'-10½"	8'-10½"	9'-9½"	9'-9½"	10'-3½"	10'-5½"	11'-3½"	11'-3½"
D—Hght. tol'w'st safe waterline ft. in.	5-6	5-9	6-3	6-6	6-6	6-9	7-3	7-4	7-4	8-0	8-0	8-6	8-8	9-3	9-3
E—Hght. to top of smoke outlet ft. in.	6-3½	6-11¾	7-10	8-4½	7-9¾	8-2¼	8-11¾	8-8½	9-1	10-2½	10-6	10-7¼	11-0¼	11-5¾	11-2¼
F—Height of return in.	19	19	20	20	20	20	20	20	20	20	21	21	21	21	21
G—Width of comb. chamber & pit in.	42½	42½	48½	48½	54½	54½	54½	60½	60½	66½	66½	72½	72½	84½	96½
H—Lgth. of comb. chamber—coal in.	54½	60½	60½	66½	66½	72½	78½	72½	78½	78½	84½	84½	90½	84½	90½
I—Tube ht. at comb. chamb. front in.	26	26	29	29	29	30½	36½	32½	32½	41	39	42½	44½	47	43¾
L—Length of ash pit ft. in.	40½	46½	46½	52½	48½	54½	60½	54½	60½	60½	66½	66½	72½	66½	72½
O—Diameter of drum in.	24	24	30	30	30	30	30	30	30	36	36	36	36	42	42
P—Foundation length ft. in.	8-11	9-10	10-8	10-8	11-2	12-2	12-10	11-10	13-10	14-10	15-10	15-10	16-10	16-10	16-10
QxR—Smoke outlets—outside, ea. in.	9½x14¾	9½x20	9½x25¼	9½x28¾	12½x22	12½x23¾	12½x27	15½x23¾	15½x28¼	15½x33¾	15½x37¼	18½x34½	18½x37½	21½x36	27½x32½
Area of smoke outlets—Total sq. in.	268	365	462	527	532	575	655	716	854	1078	1128	1250	1360	1480	1755
Water content gal.	308	370	480	570	580	680	730	745	862	940	1160	1273	1355	1714	1861
Size of main steam outlet in.	6	8	8	8	8	8	8	8	8	10	10	10	10	10	10
Size of return in.	4	5	5	5	5	5	5	5	5	6	6	6	6	6	6
Number and size of cleanouts	2-18x24	2-18x24	2-24x30	2-24x30	2-24x30	2-30x30	2-30x30	2-30x30	3-30x30	3-30x30	3-30x36	3-30x36	3-30x36	3-30x42	3-30x42
Diameter of breeching—1 boiler in.	21	23	26	28	28	30	31	31	33	35	39	41	41	43	45
Diameter of stack—1 boiler in.	19	21	24	26	26	28	29	29	31	33	36	38	38	40	42
Minimum height of stack—1 boiler ft.	55	60	65	70	70	70	75	75	75	80	95	95	95	110	110
Diameter of breeching—2 boilers in.	27	30	34	36	36	40	41	41	44	47	50	54	54	56	58
Diameter of stack—2 boilers in.	25	28	32	34	34	37	38	38	41	44	47	50	50	52	54
Minimum hght. of stack—2 boilers ft.	65	70	75	80	80	80	85	85	85	90	105	105	105	120	120
Covering surface sq. ft.	131	146	184	196	198	218	247	240	271	342	359	375	400	457	472
Weight complete, oil burning lbs.	6740	8150	9860	10630	11210	12350	13190	14550	16230	18530	21020	23390	25420	29670	33070
Weight complete, coal burning lbs.	7520	9020	10820	11700	12410	13650	14610	16010	17830	20630	23300	25865	28120	32610	36670

TWIN SECTION BOILER
FOR USE WHERE COMPLETE KNOCKDOWN IS NOT REQUIRED



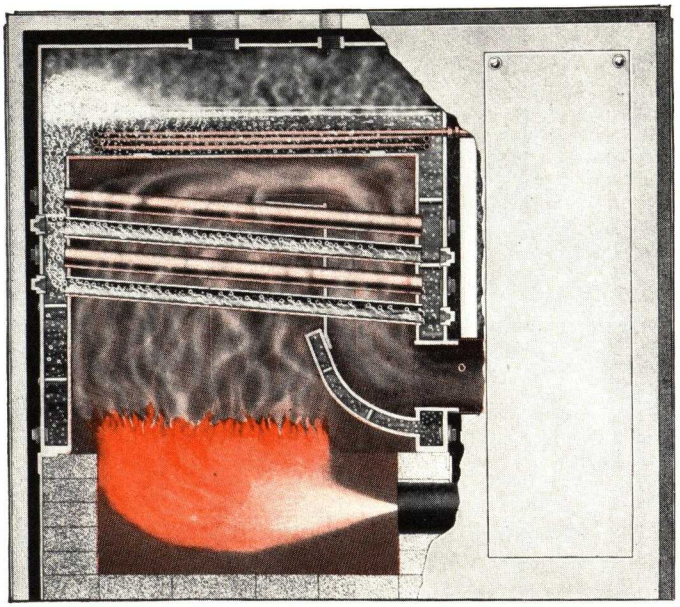
Left:
Two halves of Twin Section Boiler being brought together for bolting.

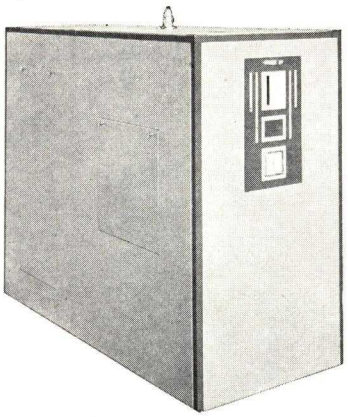
Right:
Dimensions for Twin Sections (when completely bolted) are same as for "C" on Page 6.



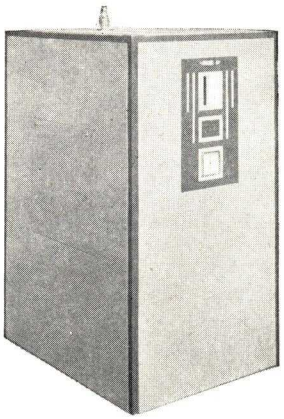
SAVE WITH THE INTERNATIONAL "FUEL-SAVER"

"FUEL-SAVER" Type "DD" Oil Burning WATER TUBE RESIDENTIAL STEEL BOILERS





Showing Jacket for DeLuxe Model Entirely Enclosing Oil Burner



Showing Jacket for Standard Model Oil Burner Partly Exposed in Rear

The International "Fuel-Saver" for residential heating meets the increasing demand for a boiler capable of absorbing the highly efficient heat generation of the various types of automatic firing devices. The superiority of water tube boilers lies mainly in their quicker steaming ability and maximum utilization of heat produced because of more effective circulation of boiler water and heated gases.

The residential "Fuel-Saver" is actually a miniature of large water tube boilers described in preceding pages and duplicates their design and rugged construction for benefit of home owner. The three principal features of water tube boiler performance of particular importance to residential heating are:

(1) *Quicker steaming* due to rapid and positive internal water circulation.

(2) *Maximum heat absorption* due to effective distribution of heated gases.

(3) *Easy to keep clean* due to accessibility of heating surfaces.

These three outstanding characteristics are producing savings for home owners in excess of twenty percent.

AIR CONDITIONING APPLICATION

The value of the efficient "Fuel-Saver" design is emphasized when used with the modern split system of air conditioning. The unusually quick steaming feature assures an adequate flow of steam to the air heat exchangers, in response to call from air conditioning controls, with an ample reserve for the direct radiation resulting in even and efficient heating.

The domestic hot water heater included in "Fuel-Saver" as standard equipment also tends to simplify the air conditioning system as it eliminates the necessity of a separate piece of equipment.

Complete information on the many other advantages of "Fuel-Saver" for split system heating will be furnished on request.

OTHER "FUEL-SAVER" FEATURES

COMPLETE COMBUSTION—Large combustion space permits mixing of air and fuel in proper proportions, insuring complete combustion.

ADEQUATE DRAFT—Hot gases passing around water tubes have self-cleaning action, preventing choking of draft through collection of soot.

LONG FLUE TRAVEL—Note how verticle baffle and low flue outlet compel gases to travel twice across tubes. This long flue travel insures absorption of maximum heat value from fuel.

LARGE STEAM SPACE—Unusually large steam disengagement area running the full length of the boiler facilitates quick steaming and provides ample storage of dry steam. Because of their free circulation, water tube boilers do not "prime" or boil over, thus eliminating the cause of annoying knocking in pipes and radiators.

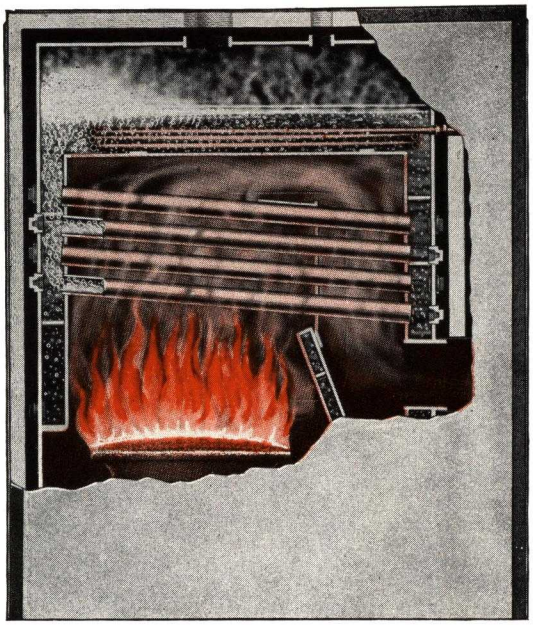
AMPLE WATER CONTENT—Ample water walls entirely enclosing the boiler and water covering the crown for the full length of the boiler maintain uniform room temperatures, without lowering the boiler water line.

CONTINUOUS HOT WATER SUPPLY—Location of the oversize copper coil in the rapidly moving water hot from the "Fuel-Saver" tubes eliminates the possibility of failure of hot water supply from stagnant chilled water around the coil.

EASILY CLEANED—Tubes and combustion chamber easily cleaned through large access door in side of boiler.

EASY BURNER SERVICING—Quick and easy access to the enclosed burner and controls in the De Luxe Jacket is provided by a full height door on each side and a removable lower panel at the rear.

INTERNATIONAL "FUEL-SAVERS"
Save for Home Owners by Stoker Operation



TYPE "DD" STOKER FIRED

The International Stoker-Boiler is of welded steel water tube construction and is particularly adapted to stoker fired operation.

The boiler is constructed so as to allow either bin feed or hopper feed stokers to be installed through the front, back, or either side. In the De Luxe models, space within the jacket at the rear of the boiler is provided, and if the stoker mechanism is sufficiently compact, this may be entirely enclosed in the boiler casing.

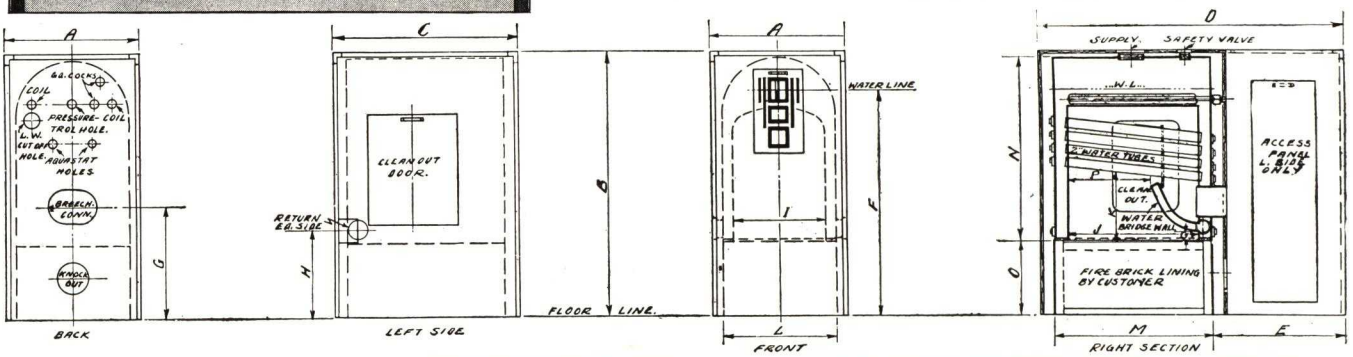
A single steel baffle directs the hot gases in two vertical passes across the tubes which are inclined slightly from the horizontal. A large clean-out door on the side of the boiler permits easy access to the interior for cleaning fly-ash from the tubes and from the settling chamber in the rear.

The jacket is well insulated and very neat in appearance. A copper coil for instantaneous heating of domestic water is available on all boilers as optional equipment.

Type "DD" was tested by the Anthracite Industries Laboratory and produced highly satisfactory results, amply substantiating our ratings and statements. Firing by a typical anthracite stoker gave extremely high overall efficiencies in this test.

ANTHRACITE INDUSTRIES INCORPORATED approved

CAPACITIES AND DIMENSIONS FOR TYPE "DD" BOILERS OIL AND STOKER FIRED



Boiler Number	DD-50	DD-51	DD-52	DD-53	DD-54	DD-55	DD-56	DD-57	DD-58	DD-59
S.H.B.I. steam rating...sq.ft.	510	634	788	1028	1201	1451	1688	1932	2271	2550
S.H.B.I. hot water rating...sq.ft.	816	1014	1260	1644	1921	2321	2700	3091	3633	4080
Heating surface...sq.ft.	30	37.3	46.4	60.5	70.7	85.4	99.3	113.7	133.6	150
Furnace volume—less base...cu.ft.	2.25	2.4	3.2	4	5.2	6.4	7.8	9.5	10.9	12.5
Gross base volume...cu.ft.	5.2	5.9	7.1	9.2	10.6	12.7	15	19.3	22.5	25.4
A—Width overall...in.	28	28	28	31	31	34	34	34	34	34
B—Height overall...in.	61	61	61	61	61	61	67	67	67	67
C—Length overall Std. Jacket...in.	36½	36½	36½	48¼	48¼	51¼	64	64	74	82
Space required to remove tubes...in.	21½	21½	26½	32½	38	41	47	54	64	72
F—Low water line height...in.	52½	52½	52½	52	52	52	58	58	58	58
G—Breeching conn. height...in.	28	28	28	25¾	25¾	25¾	28¾	28¾	28¾	28¾
Breeching conn. size...in.	6x9	6x9	6x9	7x10	7x10	7x11½	7x16	7x16	7x19	7x19
Smoke pipe size...in.	8	8	8	9	9	10	13	13	15	15
H—Return height...in.	20	20	20	20	20	20	24	24	24	24
I—Furnace width...in.	15	18	18	21	21	24	24	24	24	24
J—Furnace length...in.	18½	18½	23½	29½	35¼	38¼	44	51	61	69
P—Length to water bridge wall...in.	11¼	11¼	15	19¼	23¾	27¾	27¾	33¾	41¼	46¾
Q—Clearance at rear from base to basewall...in.	4	4	4	¼	¼	¼	¼	¼	¼	¼
K—Average height to bottom of tubes...in.	14	17	17	15¾	16	15½	17¾	17¾	17¼	17¼
L—Boiler and base width*...in.	20-21	23-24	23-24	26	26	29	29	29	29	29
M—Boiler and base length...in.	25	25	30	36	41¾	44¾	50½	57½	67½	75½
N—Boiler height**...in.	42½	42½	42½	42½	42½	42½	45½	45½	45½	45½
O—Base height...in.	17	17	17	17	17	17	20	20	20	20
Coil heating surface...sq.ft.	15	15	15	15	15	21	21	21	21	21
Maximum number gal. 140° domestic hot water per hour copper coil can — Steam, vapor	146	182	227	296	346	418	436	525	525	525
Discharge based on 40° feed water — hot water	146	180	180	180	252	252	252	252	252	252
Supply and return size...in.	3-3	4-3	4-3	4-3	4-3	5-3	6-4	6-4	6-4	6-4
Weight of bare boiler...lbs.	840	940	1040	1200	1300	1450	1760	1860	2270	2370
Weight of boiler—total...lbs.	1100	1180	1275	1485	1625	1780	2130	2180	2800	2900

* Add 4" to these widths for projection of return couplings. ** Add 2" to these heights for projection of steam couplings.

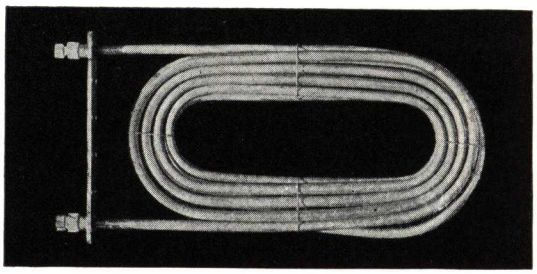
REGULAR EQUIPMENT FURNISHED WITH TYPE DD BOILERS

Steam and Vapor Boilers are fitted with safety valve, pressure gauge, water gauge, gauge cocks, and the hot water boilers with altitude gauge and thermometer.

SAVE WITH THE INTERNATIONAL "FUEL-SAVER"

INTERNATIONAL "FUEL-SAVERS" provide plenty of hot water, at low cost, clean enough for cooking

NO STORAGE TANK NECESSARY



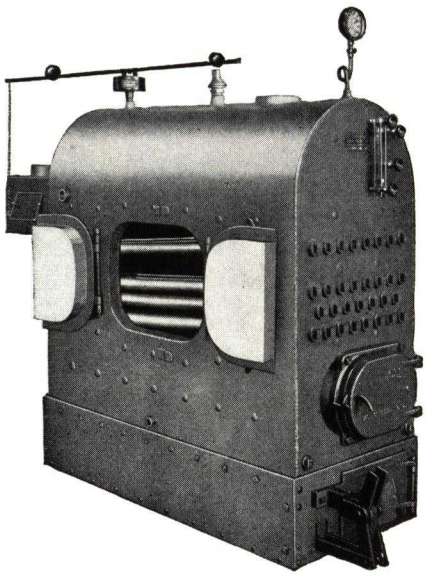
Coil of seamless copper tubing used for supplying clean hot water for domestic use.

A valuable feature of "Fuel-Saver" Water Tube Steel Boilers is the ample supply of hot water they provide for household use. The whole year round, regardless of season, "Fuel-Savers" instantaneously furnish fresh clean hot water direct from the drinking water supply. No storage tanks are necessary and thus no sediment or rust collects to taint the water used and make it unsuitable for cooking purposes. Households equipped with "Fuel-Saver" Water Tube Steel Boilers habitually use hot water direct from the faucet for cooking as well as cleaning.

An oversize heavy-gauge copper coil submerged in the heated water above the crown of the boiler furnishes an adequate supply of hot water for all domestic needs. The coil is large enough to insure an uninterrupted supply of uniformly hot water for all household requirements. In summer, when the heating system is shut down, the domestic hot water service continues in operation, automatically controlled by an aquastat supplied with the stoker.

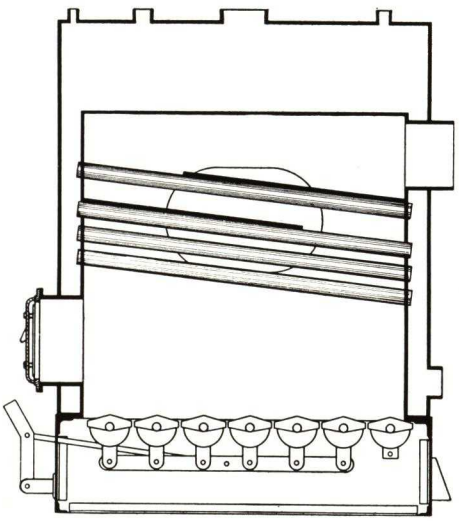
"FUEL-SAVER" Type SP For Hand-Fired Coal

ADAPTABLE FOR GAS OR OIL FUEL



International "Fuel-Saver" Water Tube Steel Heating Boiler, Type SP

Note large clean-out door providing easy accessibility for cleaning and inspection.



Line drawing showing horizontal baffling and three pass flue gas travel. Note that the grates extend the full length of the base, eliminating bridge walls and providing maximum radiant heat to the tube bank.

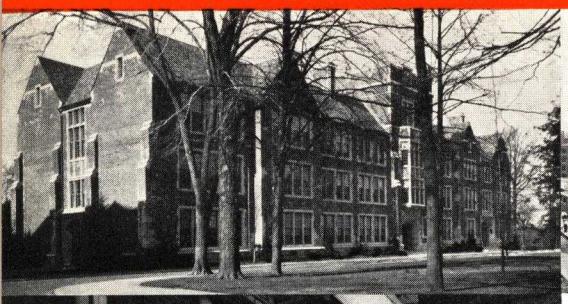
Horizontal baffling may be supplied for Type C and other International Boilers when required.

CAPACITY—
STEAM 430 TO 1960 SQ. FT.
HOT WATER 690 TO 3140 SQ. FT.

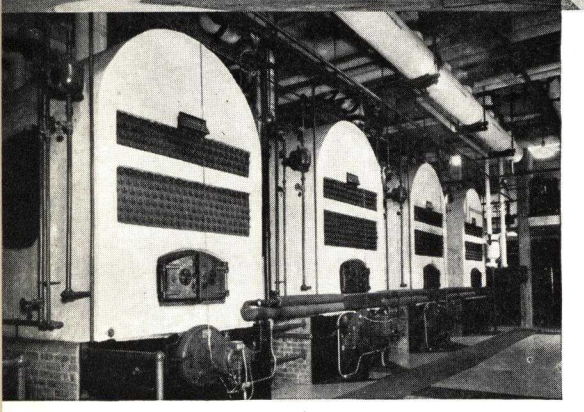
For those installations that do not require the large capacity of the Type C Boiler, the Type SP Water Tube Steel Boiler is recommended.

Although smaller than the Type C Boiler, the Type SP embodies the same sound water tube design and high quality of construction. It possesses the same quick steaming qualities and the same fuel economy and has all the desirable features of design and construction of the Type C Boiler. It is a three-pass boiler with horizontal baffles instead of vertical as in Type C.

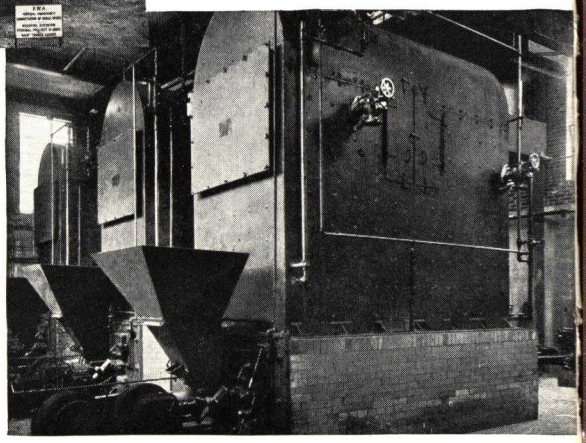
Installations of "FUEL-SAVERS" and Where They Are Made



Picture at left shows W.P.A. project at Boston, Mass., and below, stoker-fired "Fuel-Saver" installations in heating plant for the project.



Picture of large high school at Dobbs Ferry, N. Y., and below, illustration of installations of four oil-fired "Fuel-Savers" in its modern-equipped boiler room.



THE name of the International Boiler Works Company has been well-known in the field of commercial boilers for more than a half-century. In designing boilers for this work, only the soundest engineering principles can prevail, because the success or failure of such installations has far-reaching consequences. It may involve the question of profit or loss in operating an entire business enterprise.

International "Fuel-Saver" Water Tube Steel Heating Boilers are a sound investment for the owners of income-producing buildings where profits can be realized only if the cost of operation and maintenance is reduced to a minimum.

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THE INTERNATIONAL BOILER WORKS CO

EAST STROUDSBURG, PENNSYLVANIA

SALES OFFICES

NEW YORK — 101 PARK AVENUE

PHILADELPHIA SCRANTON, PA. WASHINGTON, D. C. WILMINGTON, DEL. BOSTON, MASS.

SECTION 26

CONTINUED ⟶

S. T. JOHNSON CO.

Oil Burners for Every Heating and Power Purpose

940-950 Arlington Avenue, OAKLAND, CALIF.

BRANCHES

SAN CARLOS, CALIF. SAN FRANCISCO, CALIF. SACRAMENTO, CALIF. PHILADELPHIA, PA.

Founded in 1904, S. T. Johnson Company is one of the nation's oldest and largest manufacturers of oil burning equipment and offers a complete line from the smallest domestic to the largest industrial units, with manual or full automatic ignition and control, burning from the lighter fuel oils to the heaviest grades—also combination oil and gas burners—and burners with low fire starting and modulated firing accessories. The company provides complete Engineering and Technical Service for assistance in the solution of heating problems in industry, commerce or in the home.

JOHNSON OIL BURNERS

MEMBER OBI OIL BURNER INSTITUTE

Representatives located in principal cities throughout the world.

JOHNSON COMMERCIAL TYPE ROTARY OIL BURNER

Capacities Up to 41,700 Sq. Ft. Steam Radiation or Its Equivalent

Simplicity

The three commercial types of Johnson Rotary Oil Burners are of the same basic construction, consisting of motor, fan, housing and firehole plate, concentrically mounted in a compact unit and are easily installed on any make of boiler.

Grates are removed and refractory lining provided. Burners can then be attached to the boiler or furnace through a specially constructed firehole plate furnished with the burner.

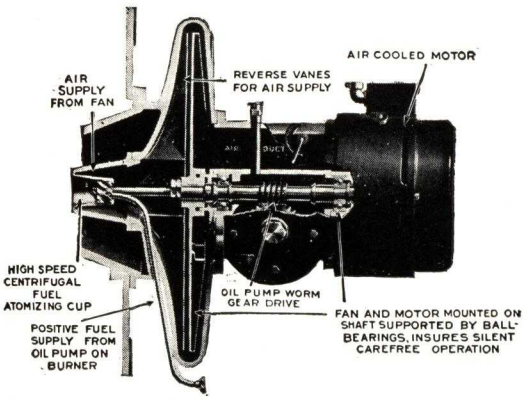
Principal dimensions, steam ratings, shipping weights and other data, are given in the table.

Air and Oil Regulation

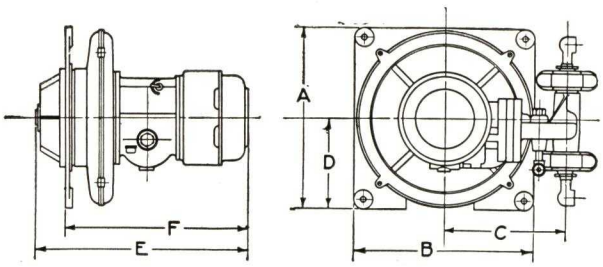
The exact amount of air necessary for perfect atomization is supplied by a motor-driven fan and adjusted by a butterfly valve. The oil regulating valve, once properly set, assures a fixed and constant quantity of fuel to the burner.

Atomization

Complete combustion of cheaper grades of fuel oil is accomplished by the Johnson method of centrifugal atomization. The combination of air and centrifugal force thoroughly atomizes the oil as it leaves the rim of the revolving atomizing cup. The impact of the air against the oil spray carries the vapor into the furnace where it is burned in suspension, creating a soft clean flame, evenly distributed throughout the firebox.



S. T. Johnson Co. Rotary Oil Burner



Burner Size No.	Capacity steam *Radiation, sq. ft. Min.	Capacity steam *Radiation, sq. ft. Max.	Boiler hp. rating	Gallons oil per hour Min.	Gallons oil per hour Max.	Size motor, hp.	Approximate shipping weight, lbs. 28	Approximate shipping weight, lbs. 30 L, 30AV	Approximate shipping weight, lbs. 30H, 30AVH	Dimensions, in. A	B	C	D	E	F
2½	825	2775	20	2	7	⅛	220	275	285	14	13 7/8	9½	6 15/16	17	15
3½	1400	6950	50	3	15	½	250	300	320	16 3/16	15 7/8	10¼	8¼	17½	15½
4½	2775	13900	100	6	30	¾	400	470	505	17	19½	13	9 5/16	21	19¼
5½	5550	27800	200	12	60	2	475	540	575	21½	21½	13	11	24	20
6½	8325	41700	300	24	90	3	525	575	625	21½	21½	13	11	25	20½

*Boiler output. Type 28 Burner available without built-in pump in same capacities.

Air and Water Separator

An oil-air and water separating tank is an exclusive Johnson feature. The tank provides absolute protection against foreign matter entering the fuel, assuring a constant flow to the burner under all conditions.

Type 30-AV and 30-AVH Fully Automatic

The 30-AV uses up to No. 5 fuel without preheating. It is equipped with Johnson-built viscosity compensating control valve furnishing constant flow of fuel to burner, regardless of fuel temperature or viscosities and without excessive pressure on lines or undue strain on pump or motor. Adjustments are made by moving lever on notched quadrant which changes size of metering orifices.

The 30-AVH is designed for efficient use of Heavy No. 6 fuel oil. Fundamentally this is the standard Johnson 30-AV Type Burner with the addition of equipment for preheating the fuel. The Johnson Viscosity-Flow Control Valve on the 30-AVH assures even firing under varied temperatures and viscosities, makes starting positive and saves on fuel. It reduces the load on the pump, adding to the life and efficiency of the burner.

The smaller horizontal rotary burners, known as Types B and B-2, though primarily designed for domestic application, are also used for industrial purposes where a steady or flexible flame is required. Using up to No. 3 fuel, they have been found satisfactory for furnaces, ranges, bakery equipment, dehydrators, etc.

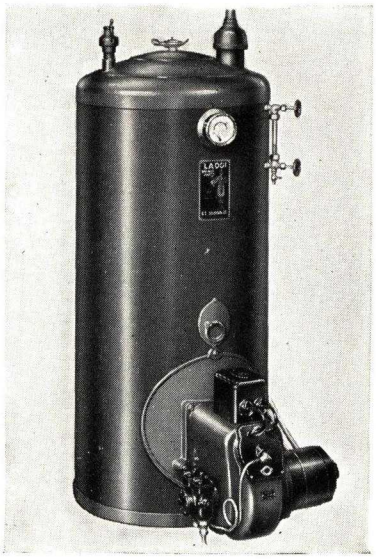
Type 28 Semi-automatic Burner

This semi-automatic, manually ignited rotary oil burner is made for heating boilers up to 41,700 sq. ft. of steam radiation or 300 boiler horsepower. It is built in five sizes, having a built-in pump, and five sizes for use with separate oil pumping equipment.

Fuel oils (preheated when necessary) as heavy as No. 6 may be used.

THE JOHNSON BUILT BOILER-BURNER 'LADDI'

For Small and Medium Size Homes



'Laddi' Du-All

'Laddi' Du-All Units set directly on the floor. Diameter at base is 24 in. on all three sizes, while heights run 4½ ft. on No. 1, 5 ft. on No. 2, and 5½ ft. on No. 3.

Johnson-built 'Laddi' Du-all oil burning units are fully automatic, odorless, quiet and trouble-free and for the purposes for which they are intended will pay for themselves in economy of operation. If you want an ample supply of low cost hot water or heat or both, get a Johnson 'Laddi' Du-all Unit.

Types and Sizes

Johnson-built 'Laddi' automatic oil burning units come in five types as listed, with three sizes in each type. Here you will find a unit that fits your requirements.

Type H—Domestic Hot Water Storage Unit for Homes
(Can be used with separate storage tank for apartments)
Type S—Steam Radiator Heat Unit **Type W**—Hot Water Radiator Unit
Combinations—Type SC—Steam Heat and Domestic Hot Water Unit. Type WC—Hot Water Heat and Domestic Hot Water Unit.

Smallest size, No. 1, is designed for 4 to 6-room homes, and Nos. 2 and 3 run from 6 up to 8 and 9-room residences.

B.T.U. Output for Sizes 1, 2, 3—Size 1—100,000 per hour. Size 2—120,000 per hour. Size 3—140,000 per hour.

General Specifications

Vertical ⅜-in. copper-bearing steel boiler shell electrically welded, tested to 150 lbs. hydrostatic pressure. Horizontal firebox with precast refractory combustion chamber; seamless extra heavy copper-bearing steel fire tubes; reversible chimney connector for either top or back connection.

Completely insulated with mineral wool—heavy steel enamel jacket.

Johnson Type B or BH Burner, 110 volts a-c., 60 cycles. Electric ignition or combination electric gas ignition. Can be supplied for direct current and odd cycles.

Each unit complete with necessary controls. Burns either Diesel fuel oil or No. 3 U. S. Standard. Each unit fully assembled and tested at factory before shipment. Jacket finish of enamel in Royal Purple and Brewster Green. Fire tubes are easily accessible for cleaning inside by removable cast iron cover; outside, by a large size brass screw plug.

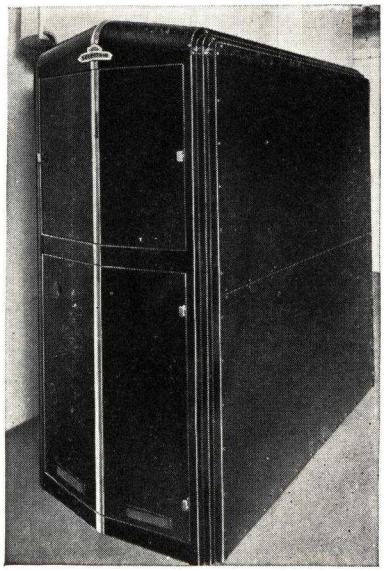
AIR-CONDITIONING UNIT—"SELECTAIR"

Combines in one compact unit every feature desired by home owners, architects and engineers for economical heating, air conditioning and ventilating the modern home. Supplies year 'round hot water for domestic use. Forced circulation of air for summer needs. It has 7 features:

(1) Air-cleaning: removes dust, soot, pollen, etc., from the air.
(2) Humidification: affords greater comfort at lower room temperatures.
(3) Automatic Oil Heating: supplies uniform heat without attention.
(4) Blower-driven conditioned air circulation to every part of the home.
(5) Year 'Round Hot Water, without additional equipment.
(6) Filtered and forced air circulation in summer, supplying clean fresh air 24 hours a day.
(7) Split (Dual) System, permits separate radiator heating of bathrooms and kitchen or other rooms (if desired) with rest of house air-conditioned.

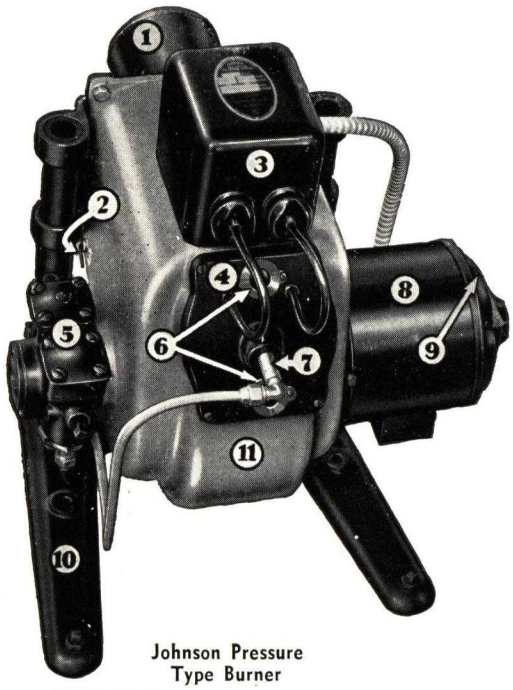
Finished in enamel with chrome trim. Boiler insulated with heavy mineral wool. Controls easily accessible for inspection or adjustment.

The "Bankheat" Burner



"Selectair"

The heart of any automatically oil fired boiler or furnace is the burner itself—and the heart of the "Selectair" is the Johnson "Bankheat" Pressure Type Burner. It is called "Bankheat" because not only is the burner designed to burn fuel oil economically and efficiently but, when required temperatures have been reached, the burner automatically shuts off. As the burner stops, the counterbalanced draft shutter closes, preventing passage of cold air through the boiler and materially conserving fuel and lengthening life of the furnace. In effect, the action is the same as the old-fashioned manual job of "banking" the fire.



Johnson Pressure Type Burner

(1) Draft tube
(2) Counterbalanced draft shutter adjustment
(3) Transformer
(4) Ignition and firing assembly plate
(5) Pump, strainer and valve unit
(6) Pyrex fire inspection holes
(7) Oil feed tube from pump to nozzle
(8) Motor, driving pump and fan
(9) Built-in thermal motor protector
(10) Pedestal mounting
(11) Single piece fan housing

CAPACITIES AND DIMENSIONS OF SELECTAIR UNIT

Size No.	Max. rating,* B.t.u. per hour	Cu. ft. air per minute	Heat exchanger, B.t.u. per hour	Stack connection, in.	Oil rate, gals. per hour	Cabinet dimensions, in.		
						Width	Length	Height
1	125,000	1485	105,000	8	1 to 1¼	27	60	54
2	200,000	2320	166,000	9	1¼ to 2	31	69	63
3	300,000	3300	235,000	10	2 to 2¾	35	86	69

*Total output includes steam to heat exchanger, heat for domestic hot water, and heat available for installed radiation if used.

KEWANEE BOILER CORPORATION

Manufacturers of Steel Riveted Firebox Heating Boilers, Smokeless Boilers, Types "C" and "R" Welded Boilers, Water Heaters, Garbage Burners and Tanks

KEWANEE, ILL.

BRANCH OFFICES IN PRINCIPAL CITIES

KEWANEE BOILERS

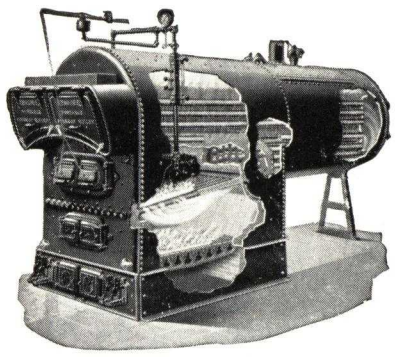
Kewanee Boilers are built sound and strong with 69 years' experience of an extensive organization backing them.

They burn any kind of fuel: hard and soft coal, hand-fired or stoker, screenings or coke; gas or oil.

Conform to the Steel Heating Boiler Institute Code of rating and American Society of Mechanical Engineers Code for construction.

Rated capacity for any water boiler is 60% greater than capacity of steam boiler specified on these four pages.

Separate catalogs on Kewanee Steel Riveted Firebox Heating Boilers, Smokeless Boilers, Power Boilers; Type "C" Welded and Type "R" Residence Boilers; Weld + Rivet Boilers, Water Heaters, Garbage Burners and Tanks, sent on request.



Smokeless Boiler
Portable Down-draft Type

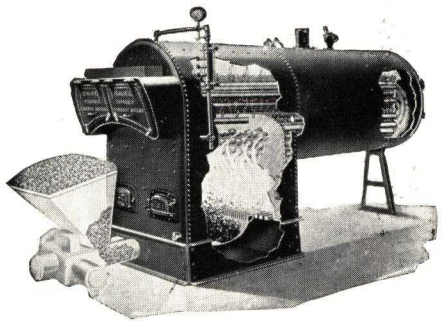
KEWANEE PORTABLE SMOKELESS RIVETED BOILER

With down-draft water grate. Preeminent for heavy duty wherever soft coal must be burned smokelessly. Used effectively either in single units for moderate loads or in batteries of big sizes for heating larger buildings with utmost economy.

SPECIFICATIONS—SMOKELESS DOWN-DRAFT BOILER—"300" SERIES

Boiler No.	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390
Rated steam capacity															
Coal, sq. ft.	3500	4000	4500	5000	6000	7000	8500	10000	12500	15000	17500	20000	25000	30000	35000
Oil, gas or stoker, sq. ft.	4250	4860	5470	6080	7290	8500	10330	12150	15180	18220	21250	24290	30360	36430	42500
Diameter x length, in. x ft. in.	42x8-3	42x9-3	48x8-7½	48x9-5	54x11-2½	54x12-11	60x12-8½	60x14-9	66x14-11	66x17-4	72x16-5	78x17-0½	78x20-7½	84x19-11	84x22-8
Over-all height, in.	80	80	86	86	94	94	101	101	107	107	113	115	115	125	125
Height of water line, in.	70	70	73	73	78	78	85	85	88½	88½	94½	95	95	107½	107½
Approximate weight															
Coal, lbs.	6800	7500	8100	8800	10000	11100	13600	15300	18000	20500	22900	25100	29500	33600	37500
Oil, lbs.	6200	6900	7400	8000	9100	10100	12500	14100	16500	18900	21200	23200	27500	31500	35200

KEWANEE PORTABLE RIVETED FIREBOX BOILERS



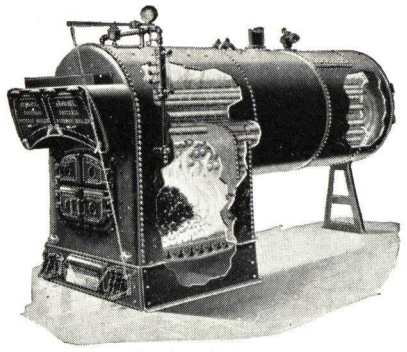
Firebox Boiler for Stoker

The "400" and "500" series are riveted up-draft firebox boilers. The "400" series have two-pass 4-in. tubes. The "500" series have two-pass 3-in. tubes. The Portable Firebox Boiler generally requires less floor space than the Brickset type and is easier to clean.

The high-class workmanship on Kewanee Boilers is proverbial in the trade and in the architectural profession. They are soundly constructed. Every seam is made tight at the factory. They go into the building all in one piece and need no brick setting in the Portable type.

Low Upkeep Costs—Comprehensive records extending back many years on quite a number of fairly large installations, proved the average repair cost less than $2.00 a year. Many of those boilers had been in constant use 25 years or more, and most repairs consisted of replacing grate bars—an inexpensive operation.

Kewanee Boilers are used extensively for burning oil because the extreme heat is fully developed in the ample firebox and absorbed by the large water content.



Firebox Boiler
Portable Up-draft Type

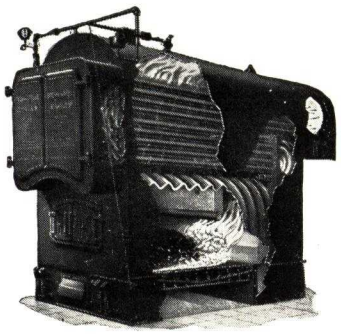
SPECIFICATIONS—PORTABLE UP-DRAFT BOILER—"400" SERIES

Boiler No.	480	481	482	483	484	485	486	487	488	489	490
Rated steam cap.											
Coal, sq. ft.	6000	7000	8500	10000	12500	15000	17500	20000	25000	30000	35000
Oil, gas or stoker, sq. ft.	7290	8500	10330	12150	15180	18220	21250	24290	30360	36430	42500
Diameter x length, in. x ft. in.	54x11-5	54x13-1½	60x13-4½	60x15-5½	66x15-6½	66x18-0½	72x17-0	78x17-7½	78x21-3½	84x20-7	84x23-4
Over-all height, in.	94	94	101	101	107	107	113	115	115	125	125
Ht. of water line, in.	78	78	85	85	88½	88½	94½	95	95	107½	107½
Approximate weight											
Coal, lbs.	10200	11400	13300	14800	17300	19700	22000	24200	28400	32300	36100
Oil, lbs.	9300	10400	12200	13600	15800	18100	20300	22300	26400	30200	33800

SPECIFICATIONS—PORTABLE UP-DRAFT BOILER—"500" SERIES

Boiler No.	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590
Rated steam capacity															
Coal, sq. ft.	3500	4000	4500	5000	6000	7000	8500	10000	12500	15000	17500	20000	25000	30000	35000
Oil, gas or stoker, sq. ft.	4250	4860	5470	6080	7290	8500	10330	12150	15180	18220	21250	24290	30360	36430	42500
Diameter x length, in. x ft. in.	42x8-7	42x9-6½	48x8-10	48x9-6½	54x9-2½	54x10-6	60x11-1	60x12-9	66x12-10	66x14-9	72x14-9	78x14-9	78x17-7½	84x17-9½	84x20-0½
Over-all height, in.	80	80	86	86	94	94	101	101	107	107	113	115	115	125	125
Height of water line, in.	70	70	73	73	79½	79½	84½	84½	89½	89½	94	96½	96½	105	105
Approximate weight															
Coal, lbs.	6100	6700	7300	7900	9000	10000	11500	13000	15200	17300	19300	21200	25000	28400	31700
Oil, lbs.	5500	6100	6600	7100	8100	9000	10400	11800	13700	15700	17600	19300	23000	26300	29400

KEWANEE TYPE "C" WELDED BOILERS



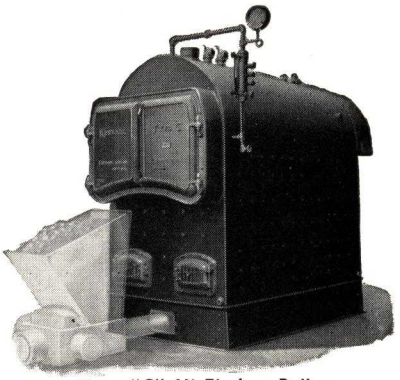
Type "C" Boiler with Corrugated Crown Sheet

774-790 and 2773-2790 for coal. Also 1773-1790 for burning oil

This highly perfected series is a compact welded boiler with 3-in. tubes. Adaptable to restricted accommodations. A later Kewanee development with corrugated crown sheet.

This corrugated crown sheet, an exclusive Kewanee feature, has much greater strength and adds more heating surface where it does most good for quick steaming. Additionally the corrugations give greater height for better combustion, are self-draining and self-cleaning of mud and sediment. Expansion and contraction help to break up and eliminate scale. This type of crown sheet draws a larger volume of water to protect the hottest parts, promoting faster circulation and easier firing.

The "700" series has smokeless arch and drum for soft coal; "2700" series is direct-draft for hard coal; "1700" series is direct-draft for oil or gas burning; "0700" series is the regular direct-draft for stoker; or the Hi-Firebox Boiler with extended water leg, 7L70 series is for mechanical firing; and 27L70, hand fired.



Type "C" Hi-Firebox Boiler

7L70 Series. Long water leg with extra height in firebox to comply with S.H.B.I. Code for stoker firing

SPECIFICATIONS—TYPE "C" WELDED BOILER

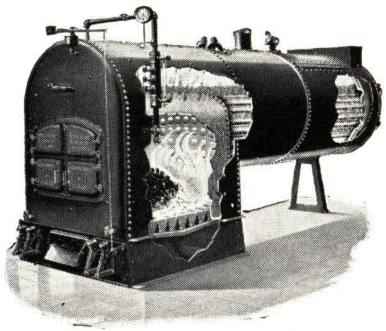
Boiler No.	2773	774 2774	775 2775	776 2776	777 2777	778 2778	779 2779	780 2780	781 2781	782 2782	783 2783	784 2784	785 2785	786 2786	787 2787	788 2788	789 2789	790 2790
Rated steam capacity																		
Coal, sq. ft.	2200	2600	3000	3500	4000	4500	5000	6000	7000	8500	10000	12500	15000	17500	20000	25000	30000	35000
Oil, Gas or stoker, sq. ft.	2680	3160	3650	4250	4860	5470	6080	7290	8500	10330	12150	15180	18220	21250	24290	30360	36430	42500
Diameter x length, in. x ft. in.	36x5-10	36x6-4	36x6-10	36x7-8½	42x7-10½	42x8-6½	42x9-2	48x9-4½	48x10-7	54x9-11	54x11-2½	60x11-6½	66x12-3½	72x12-1½	72x13-4½	78x14-9½	84x14-2½	84x15-11½
Over-all height, in.	77½	77½	77½	77½	83½	83½	83½	86½	86½	99	99	108½	112	118	118	122	135	135
Height of water line, in.	69	69	69	69	72	72	72	73	73	85	85	94	95	101	101	103	114	114
Approximate weight																		
700 series coal, lbs.		3900	4400	5000	5500	6000	6500	7500	8400	9700	11000	12900	14900	16600	18400	22000	25200	28400
2700 series coal, lbs.	3400	3800	4300	4800	5300	5800	6300	7200	8100	9400	10600	12500	14400	16100	17900	21200	24400	27500
Oil, lbs.	2900	3300	3700	4100	4600	5000	5400	6100	6900	8000	9100	10700	12300	13800	15400	18100	20900	23400

Boiler series 1773-1790 for oil, gas, stoker; series 2773-2790 for anthracite.

SPECIFICATIONS—TYPE "C" HI-FIREBOX WELDED BOILER

Boiler No.	7L73	7L74	7L75	7L76	7L77	7L78	7L79	7L80	7L81	7L82	7L83	7L84	7L85	7L86	7L87	7L88	7L89	7L90
Rated steam capacity, stoker, sq. ft.	2680	3160	3650	4250	4860	5470	6080	7290	8500	10330	12150	15180	18220	21250	24290	30360	36430	42500
Diameter x length, in. x ft. in.	36x5-10	36x6-4	36x6-10	36x7-8½	42x7-10½	42x8-6½	42x9-2	48x9-4½	48x10-7	54x9-11	54x11-2½	60x11-6½	66x12-3½	72x12-1½	72x13-4½	78x14-9½	84x14-2½	84x15-11½
Over-all height, in.	82½	82½	82½	82½	88½	88½	88½	94½	94½	108	108	119½	123	131	134	140	157	161
Height of water line, in.	74	74	74	74	77	77	77	81	81	94	94	105	106	114	117	121	136	140
Approximate weight, lbs.	3100	3500	3900	4400	4900	5400	5800	6700	7600	8800	10000	11800	13600	15300	17000	20100	23200	26100

KEWANEE TYPE "K" RIVETED BOILER



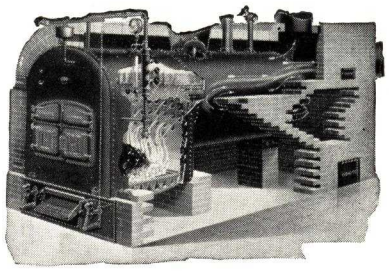
Type "K" Up-draft Boiler

Type "K" is designed for heating average and moderate size buildings dependably. Has the same rugged construction as the larger Kewanee Boiler. Fits in limited headroom. This up-draft Type "K" burns coal, oil or gas economically.

Kewanee makes a steel heating boiler to heat every size and type of building and to suit any condition of service. Shipment of boilers may usually be made same day order is received.

KEWANEE BRICKSET RIVETED FIREBOX BOILER

Standard of the trade for years. An up-draft boiler for use in apartment houses, hotels, office buildings, factories, etc., burning coal, oil or gas.



Brickset Boiler Up-draft Type

SPECIFICATIONS—TYPE "K" UP-DRAFT BOILER

Boiler No.	3K	4K	5K	6K	8K	9K	10K	11K	12K	13K	14K	15K	16K	18K	20K
Rated steam capacity															
Coal, sq. ft.	1240	1380	1800	2200	3000	3500	4000	4500	5000	6000	7000	8500	10000	12500	15000
Oil, gas or stoker, sq. ft.	1770	2020	2190	2680	3650	4250	4860	5470	6080	7290	8500	10330	12150	15180	18220
Diameter x length, in. x ft. in.	30x9-10	36x8-10	36x10-4	36x11-10	42x11-4	42x12-10	48x11-10	48x13-4	48x14-10	54x15-3	54x17-9	60x17-0	60x19-6	66x19-6	72x19-6
Over-all height, in.	59	65	65	65	71	71	77	77	77	83	83	93	93	99	105
Height of water line, in.	52	55	55	55	58½	58½	61	61	61	66	66	75	75	80	85½
Approximate weight															
Coal, lbs.	3500	3900	4200	4700	5700	6400	7000	7600	8200	9500	10700	12600	14500	17600	20700
Oil, lbs.	3130	3550	3800	4200	5100	5800	6400	6900	7400	8600	9700	11500	13300	16100	19100

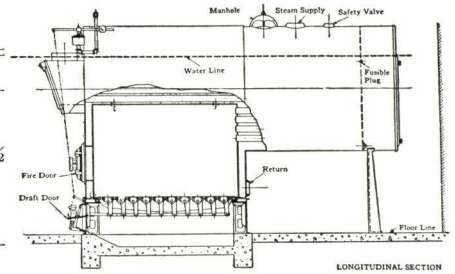
SPECIFICATIONS—BRICKSET UP-DRAFT BOILER

Boiler No.	3	4	5	6	8	9	10	11	12	13	14	15	17	18	19	20
Rated steam capacity																
Coal, sq. ft.	1240	1380	1800	2200	3500	4000	4500	5000	6000	7000	8500	10000	12500	15000	17500	20000
Oil, gas or stoker, sq. ft.	1770	2020	2190	2680	4250	4860	5470	6080	7290	8500	10330	12150	15180	18220	21250	24290
Diameter x length, in. x ft. in.	30x8-6	36x7-6	36x9-0	36x10-6	42x10-0	42x11-6	48x10-6	48x12-0	48x13-6	54x13-11	54x16-5	60x15-6	66x16-0	66x18-0	72x16-0	72x18-0
Over-all height, in.	47	53	53	53	59	59	65	65	65	71	71	78	84	84	90	90
Height of water line, in.	52	55	55	55	58½	58½	61	61	61	66	66	75	80	80	85½	85½
Approximate weight																
Coal, lbs.	2900	3300	3500	3900	5200	5700	6200	6700	7800	8800	10300	11800	14300	16800	19400	21900
Oil, lbs.	2500	2900	3100	3400	4600	5100	5500	5900	6900	7800	9200	10600	12800	15200	17700	20000

KEWANEE WELD + RIVET FIREBOX BOILERS

These Weld + Rivet Boilers are portable firebox type with 3-in. tubes. "5000" series is up-draft and "6000" series has the smokeless down-draft water grate. They are adapted for coal hand-fired; and oil, gas or stoker 5100 series and 6100 series.

This design features increased heating surface, steam space, disengaging area, furnace volume and water content, yet takes up less room. The steel base is shipped assembled, with grates. All seams are welded solid but the longitudinal butt-strap joint is riveted as required in some states and cities.



LONGITUDINAL SECTION

SPECIFICATIONS—WELD + RIVET FIREBOX BOILER—"5000" SERIES

Boiler No.	5081	5082	5083	5084	5085	5086	5087	5088	5089	5090
Rated steam capacity										
Coal, sq. ft.	7000	8500	10000	12500	15000	17500	20000	25000	30000	35000
Oil, gas or stoker, sq. ft.	8500	10330	12150	15180	18220	21250	24290	30360	36430	42500
Diam. x length, in. x ft. in.	54x9–2	54x11–1	54x12–9	60x13–2½	60x15–3	66x14–5½	66x16–0½	72x16–8½	78x17–5½	78x19–8½
Over-all height, in.	92½	92½	92½	100½	100½	105	105	112	117	117
Height of water line, in.	78	78	78	84	84	86	86	94½	96	96
Approximate weight										
Coal, lbs.	8400	9600	10800	12600	14400	16100	17900	21200	24400	27500
Oil, lbs.	7400	8500	9600	11100	12800	14400	16000	19200	22300	25200

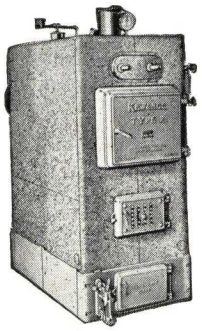
SPECIFICATIONS—WELD + RIVET SMOKELESS BOILER—"6000" SERIES

Boiler No.	6077	6078	6079	6080	6081	6082	6083	6084	6085	6086	6087	6088	6089	6090
Rated steam capacity														
Coal, sq. ft.	4000	4500	5000	6000	7000	8500	10000	12500	15000	17500	20000	25000	30000	35000
Oil, gas or stoker, sq. ft.	4860	5470	6080	7290	8500	10330	12150	15180	18220	21250	24290	30360	36430	42500
Diameter x length, in. x ft. in.	42x8–2	42x8–8	42x9–6	48x9–7	48x11–0	54x10–8½	54x12–4½	60x12–9½	60x14–9½	66x14–0½	66x15–7½	72x16–4½	78x17–1	78x19–4
Over-all height, in.	81	81	81	86½	86½	92½	92½	100½	100½	105	105	112	117	117
Height of water line, in.	70	70	70	73½	73½	78	78	84	84	86	86	94½	96	96
Approximate weight														
Coal, lbs.	5800	6300	6800	7700	8600	9900	11200	13100	14900	16600	18300	21500	24500	27300
Oil, lbs.	5100	5600	6100	7000	7800	8900	10100	11900	13500	15100	16700	19800	22700	25300

KEWANEE TYPE "R" RESIDENCE BOILERS

Kewanee Type "R" Boilers are especially designed and constructed to meet all heating and hot water requirements for homes and small buildings. Every kind of solid fuel, coke, all grades of hard or soft coals and their briquette or treated forms are burned with excellent results. Also, any liquid fuel, oil, and natural or commercial gas can be used with high efficiency.

The Square Type "R" jacketed or unjacketed steel boiler is built to provide dependable heat from all fuels, either with hand firing or mechanical firing, in medium and large residence size jobs.


Square Type "R" Jacketed Boiler

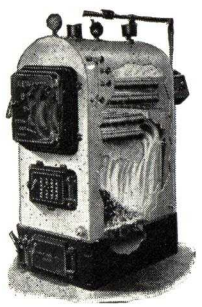
The two smaller size Square Type "R's" have tapered sides. The four larger size Square Type "R's" have straight sides.

Fire door for coal and stoker has air slides; oil or gas has peephole. All Square "R" boilers have flanged box for fitting with hot water coil.

For oil, gas or stoker boilers the efficiency is increased 5% by the spinner blades, which are furnished as regular equipment in the two-pass tubes.

Type "R" steel boiler is a recent Kewanee development employing characteristically sound steel construction in the compacted style of heating unit. All "R" boilers are completely built, assembled and tested at the factory. They go into the building in one piece. Even the larger sizes will go through the average size doorway. And they are ready to set on their bases and hook up to the mains without any assembling charges, header or piping connections to make.

Kewanee Hot Water Copper Coils may be fitted in all sizes for domestic hot water needs.


Square Type "R" Residence Boiler

SPECIFICATIONS—SQUARE TYPE "R" RESIDENCE BOILER

*Boiler No.	742	743	745	746	747	748
Rated steam capacity:						
Coal, sq. ft.	790	1000	1350	1600	1780	1960
Oil, gas or stoker, sq. ft.	840	1120	1470	1900	2160	2380
Width and length, in.	32½x39½	32½x45½	32x45½	32x51½	32x57½	32x63½
Over-all height, in.	59½	59½	70¼	70¼	70¼	70¼
Height water line, without coil, in.	48	48	58½	58½	58½	58½
Shipping weight, unjacketed:						
Coal, lbs.	2150	2360	2800	3050	3300	3550
Oil, lbs.	1900	2060	2500	2730	2920	3125
Jacket, crated, add., lbs.	205	225	175	190	200	225

*Boiler Series 2742-2748 for anthracite; Series 1742-1748 for oil, gas; 0742-0748 for stoker.

KEWANEE 83R SERIES JACKETED SQUARE TYPE RESIDENCE BOILERS OIL OR GAS

The Kewanee 83R Series Boiler is a Square Type "R" designed exclusively for oil and gas fuels. In it are combined all those typical Kewanee features of design and construction which insure perfect results with these fuels.

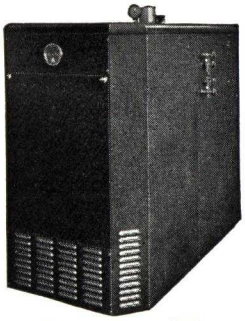
The 83R series has 2-pass tubes to provide double travel for the gases, holding them in the boiler longer, to use all available heat. These are equipped with spinner blades that force the hot gases to "scrub" the tube walls with an unobstructed streamline swirl, transferring the heat to the water quickly and certainly.

A two-way draft adjuster, of special Kewanee design and make, provides automatic, accurate and even control of the draft, resulting in considerable fuel saving.

83R Oil or Gas Jacketed Boiler

In the front head is a covered coil box for Kewanee copper coils of any capacity for storage tank hot water or instantaneous flow without tank. Incinerator grates can be installed in larger sizes.

A stack control opening is provided in the rear hood and in the front smokebox frame. Tapped openings on either side of the boiler shell can be used for aquastat. There are plenty of washout plugs in the shell, and knock-out discs in jackets opposite all boiler openings. All jacketed Kewanee Boilers have an indestructible baked enamel steel jacket lined with insulation. Kewanee Type "R" Boilers burning oil or gas can be operated in the average home at efficiencies of 80% and more, providing dependable heat at low cost.


Square Type "R" in Regal Jacket

SPECIFICATIONS—SQUARE TYPE 83R FOR OIL OR GAS

Boiler No.	83R1	83R2	83R3	83R4	83R6	83R7	83R8	83R9
Rated capacity, steam, sq. ft.	901	1105	1326	1513	2091	2363	2652	2924
Over-all boiler width, in.	32½	32½	32½	32½	32	32	32	32
Over-all shell length, in.	27½	33½	39½	45½	45½	51½	57½	63½
Over-all height, in.	60¾	60¾	60¾	60¾	71½	71½	71½	71½
Height water line, without coil, in.	48	48	48	48	58½	58½	58½	58½
Shipping weight, complete, lbs.	1600	1800	2000	2200	2800	2900	3100	3300

KEWANEE ROUND "R" STEEL BOILERS—REGAL, SQUARE AND ROUND JACKETS

For heating homes and smaller buildings, the Round Type "R" Boiler fully measures up to those Kewanee standards of craftsmanship which positively insure dependable performance from smart looking equipment.

This boiler operates with equally high efficiency (80% plus) in steam, vapor, or hot water heating systems, using any of the locally available fuels for mechanical firing with oil, gas and stoker or for hand firing with bituminous coal, coke or anthracite, or is used as direct water heater 500 to 900-gal. capacity.

A domestic hot water coil heating 65 to 75 gal. 100° in 3 hours is included. For larger storage tank service, 95 to 110 or 170-gal. coil may be ordered; and on 736 and 1737 boilers only, a 200-gal. coil is available, at small extra cost.

For instantaneous flow, 170-gal. coil may be purchased; or on 735, 736 and 1737 boilers, 210-gal. coil is available; or a 250-gal. coil on 736 and 1737 only, all for use without tank.

The chief advantages to be found in the Kewanee Round Vertical Boiler are:

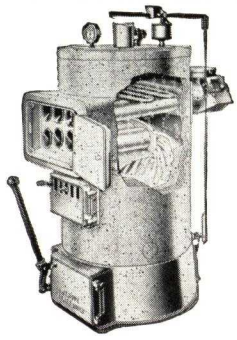
Simple one-piece steel welded construction. Shell goes through 31-34 in. doorway, easily handled, ready to set on base. So there are no assembling charges.

Two-pass tubes give the economy of long gas travel with easy accessibility for instant cleaning.

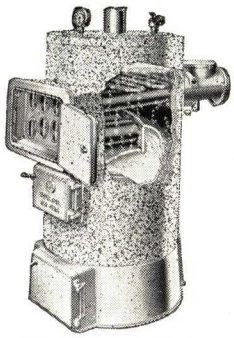
Equipment is substantial to stand rough usage and the refractory insulated doors are ground to gas-tight finish.

Upkeep costs are kept low due to good design, yet mass production methods keep the purchase price low also.

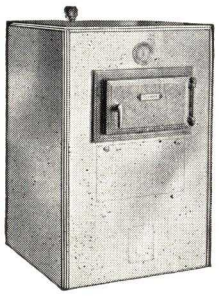
Smartline Regal and Rex Square Jackets match modern basements. Small floor space is occupied by circular base only when the round insulating jacket is used.



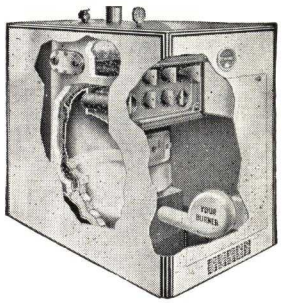
Round Jacket Round "R" Coal



Round Jacket Round "R" Oil, Gas or Stoker



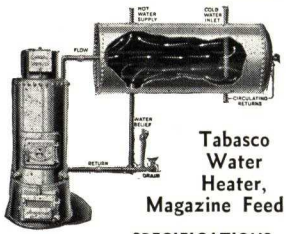
Round "R" Smartline Rex Square Jacket



Round "R" Regal Jacket for Complete Enclosures

SPECIFICATIONS—ROUND TYPE "R" BOILER

Boiler No.:				Boiler No.:				
Soft coal	734	735	736	Oil, gas	1734	1735	1736	1737
Hard coal	2734	2735	2736	Stoker	0734	0735	0736	....
Rated capacity, steam, sq. ft	320	410	550	Rated capacity, steam, sq. ft	400	540	680	900
Inside diameter, in	20	23	26	Inside diameter, in	20	23	26	26
Over-all height, in	54¾	55¼	59½	Over-all height, in	54¾	55¼	59½	61
Height water line, without coil, in	44	44	46	Height water line, without coil, in	44	44	46	49
Shipping weight, unjacketed, lbs	880	1040	1280	Shipping weight, unjacketed, lbs	800	920	1130	1400



Tabasco Water Heater, Magazine Feed

KEWANEE TABASCO WATER HEATERS

Kewanee Riveted Steel Water Heaters are economical to operate with any kind of fuel. Riveted steel construction makes them safe for high water pressure now carried in most cities and insures against repairs from cracking or breaking. Brass clean-out plugs or handholes are furnished on all Heaters and Garbage Burners. Tabasco Heaters, both magazine feed and surface burning type are equipped with Tabasco improved rocking—a sectional clinker-cutting dumping grate.

Maximum working pressure is 60 lbs. standard, 100 lbs. for extra heavy.

All Heater ratings, both Tabasco and Garbage Burner, are based on raising temperature of water 50° in 1 hour.

SPECIFICATIONS—TABASCO WATER HEATERS

Heater No.	Capacity, gal., per hr.	Heater, Size in.	Hgt., in.	Flow and return, in.	Weight, lbs.		Diam. smoke conn., in.	Diam. grate, in.
					Magazine feed	Surface burner		
17	130	17x32	57	Two-1¼	570	500	6	12½
18	150	17x36	61	Two-1¼	590	520	6	12½
21	200	21x30	55	Two-1½	700	600	7	15
22	250	21x36	62	Two-1½	760	660	7	15
25	300	25x37	63	Two-2	1030	880	8¼	19
26	350	25x43	69	Two-2	1100	950	8¼	19
27	400	25x49	75	Two-2	1200	1050	8¼	19
30	500	30x43	70	Two-2½	1400	1220	8¼	24
31	600	30x49	76	Two-2½	1620	1420	8¼	24
32	700	30x58	85	Two-2½	1700	1510	8¼	24

EXTRA HEAVY HEATERS—TYPE R

No.	Capacity, gal.	Hgt., ft. in.	Aprx. ship. wt. lbs.	
			Surface burner	Magazine feed
150	150	5 1	520	590
200	200	4 7	600	700
300	300	5 3	880	1030
400	400	6 3	1050	1200
500	500	5 10	1220	1400
600	600	6 4	1420	1620
700	700	7 1	1510	1700

EXTRA HEAVY HEATERS AND TYPE S VERTICAL TANK

Size, in. ft.	Capacity, gal.	Height, tank and stand, ft. in.	Weight, lbs.	
			Tank	Tank stand
36x5	265	7 2	1000	160
42x5	360	7 3	1300	180
48x5	470	7 4	1500	200
54x5	590	7 5	2000	220
60x5	730	7 6	2400	250
60x5½	800	8 0	2500	250
60x6	875	8 6	2600	250

KEWANEE WATER HEATING GARBAGE BURNERS

Water heating garbage burners are built of riveted steel for a working pressure of 125 lbs. per sq. in., to withstand city water pressure without cracking or bursting. They eliminate unpleasant features of accumulated garbage in apartments, clubs, sanitariums, hotels, restaurants, save expense of its removal, and in producing hot water by incineration cut the fuel bill of an ordinary heater in half. Operation is very simple. A small fire is started on lower grates, and garbage thrown into the upper chamber in any quantity; even when filled, garbage is dried to a combustible condition in a short time by means of the patented *by-pass* and burns without odor, leaving only a small amount of ash. These burners will produce best results when hot water storage tank attached has a capacity of 50% greater than the hourly heating capacity of the burner.

SPECIFICATIONS—WATER HEATING GARBAGE BURNERS

	Type A				Type D							Type H				
Catalog No	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Capacity, gal. per hr., 50° raise	200	300	400	600	500	600	800	1000	1200	1500	1800	1200	1500	1800	2200	2600
Capacity, garbage chamber, 1 charge, bu.	1	2	3	4	2	3	4	5	7	9	12	6	8	9	11	12
Over-all height, in	62	68	68	68	57	57	57	57	57	57	57	65	65	65	65	65
Floor space, in	22	25	30	36	29x29	29x35	35x35	35x41	35x47	41x53	41x59	36x38	38x42	38x48	38x54	38x60
Approx. ship. wt., lbs.	730	970	1190	1640	1650	1800	2100	2320	2550	3100	3320	2620	2820	3020	3450	3700

Type D

LOOKOUT BOILER & MANUFACTURING COMPANY

SUCCESSORS TO THE HEGGIE SIMPLEX BOILER CO., JOLIET, ILL.

CHATTANOOGA, TENNESSEE

REPRESENTED IN

ALBANY, N. Y.
AMARILLO, TEX.
ATLANTA, GA.
BALTIMORE, MD.
BIRMINGHAM, ALA.
BOSTON, MASS.
BUFFALO, N. Y.
CHARLESTON, W. VA.
CHARLOTTE, N. C.
CHICAGO, ILL.
CINCINNATI, OHIO
CLARKSBURG, W. VA.
CLEVELAND, OHIO
COLUMBUS, GA.
COLUMBUS, OHIO
DALLAS, TEX.
DENVER, COLO.
DES MOINES, IOWA
DETROIT, MICH.
EL PASO, TEX.
EVANSVILLE, IND.
FT. WAYNE, IND.
GRAND RAPIDS, MICH.
HARRISBURG, PA.
HOUSTON, TEX.
INDIANAPOLIS, IND.
JACKSONVILLE, FLA.
JOLIET, ILL.
KANSAS CITY, MO.
KNOXVILLE, TENN.
LITTLE ROCK, ARK.
LODI, WIS.
LONG ISLAND CITY, N. Y.
LOUISVILLE, KY.
MEMPHIS, TENN.
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NEW ORLEANS, LA.
NEW YORK, N. Y.
OKLAHOMA CITY, OKLA.
OMAHA, NEB.
PHILADELPHIA, PA.
PITTSBURGH, PA.
RICHMOND, VA.
ROCHESTER, N. Y.
ST. LOUIS, MO.
SAGINAW, MICH.
SAN ANTONIO, TEX.
SHREVEPORT, LA.
SIOUX CITY, IA.
SYRACUSE, N. Y.
TOLEDO, OHIO
WASHINGTON, D. C.
WILKES-BARRE, PA.

LOOKOUT HEGGIE-SIMPLEX STEEL HEATING BOILERS

LOOKOUT Reg. U. S. Pat. Office

Standard Series — Steel Plate — Welded Joints — A.S.M.E. Construction

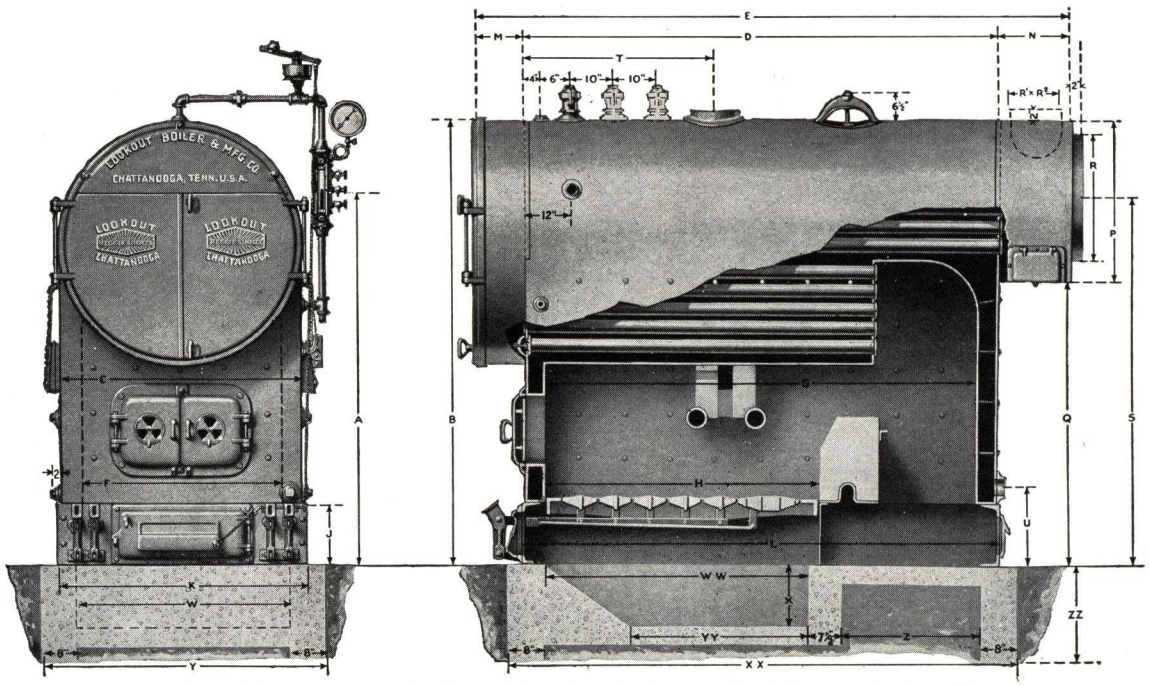
Mechanical Fired Type for Oil, Gas, or Stoker
Direct Draft Type for Hand Firing Any Solid Fuel
Smokeless Arch Type for Hand Firing Soft Coal

15-lb. Steam Working Pressure — 30-lb. Water Working Pressure

HEGGIE-SIMPLEX Reg. U. S. Pat. Office

By ordering with or without Patented Smokeless Arch and with or without Grate Assembly the Standard Series Boiler can be furnished in the following types:

Mechanical Fired Type for Oil, Gas or Stoker—Order without both Patented Smokeless Arch and without Shaking Grate Assembly.
Direct Draft Type for Hand Firing—Order with Shaking Grate Assembly only, no Patented Smokeless Arch required.
Smokeless Arch Type for Hand Firing—Order with both Patented Smokeless Arch and with Shaking Grate Assembly.



Standard Series Boiler with Patented Smokeless Arch and with Shaking Grate Assembly

STANDARD EQUIPMENT

For Mechanical Fired Type—
Steam Boilers and Water Boilers consist of: Flue Door and Frame; Firing Door, Frame, Liner, and Ventilator; blank steel Base Front; Wire Flue Brush and Rod.
Steam Boilers only, in addition to the above, are furnished with Safety Valve set to relieve at 15-lbs.; Steam Gage with Syphon and Cock; Water Column with Gage Cocks, Water Gage and Glass, no piping; and Surface Blow-off Opening, 2-in. pipe size.

For Direct Draft Type—
Steam Boilers and Water Boilers consist of: Flue Door and Frame; Firing Door, Frame, Liner, and Ventilator; Ash Door, Frame, and Balanced Damper; Firing Tools consisting of hoe, poker, and slice bar; Wire Flue Brush and Rod; Rocking Grates with ½-in. air spaces for burning soft coal are standard; the Dump Grate Section has ¼-in. air spaces; All-Dumping Buckweat Grates can be furnished at an extra charge; Bridgewall of specially designed tile, except with sizes 34A, 34C, 40A, and 40B which do not require a Bridgewall.
Steam Boilers only, in addition to the above, are furnished with Safety Valve set to relieve at 15-lbs.; Steam Gage with Syphon and Cock; Damper Regulator; Water Column with Gage Cocks, Water Gage and Glass, no piping; and Surface Blow-off Opening, 2-in. pipe size.

For Smokeless Arch Type—
Steam Boilers and Water Boilers consist of: Flue Door and Frame; Firing Door, Frame, Liner, and Ventilator; Ash Door, Frame, and Balanced Damper; Smokeless Arch Air Intake Doors and Frames, with operating chain and handle; Specially designed Smokeless Arch Tile fitted and shipped in place; Firing Tools consisting of hoe, poker, and slice bar; Wire Flue Brush and Rod, Rocking Grates with ½-in. air spaces for burning soft coal are furnished as standard, the Dump Grate has ¼-in. air spaces; Bridgewall of specially designed tile, except with size 34A, 34C, 40A, and 40B which do not require a Bridgewall.
Steam Boilers only, in addition to the above, are furnished with Safety Valve set to relieve at 15-lbs.; Steam Gage with Syphon and Cock; Damper Regulator, Water Column with Gage Cocks, Water Gage and Glass, no piping; and Surface Blow-off Opening, 2-in. pipe size.

All boilers 52 in. in diameter or width and larger have a 11x15-in. Manhole in top of shell with cover plate, bolts, crabs and gasket to fit.
Outlet and Return Openings for Water Boilers will be the same size as furnished with the corresponding steam boiler unless otherwise specified on order for water boiler.
Rear Smoke Outlet Connections are standard and will be furnished unless otherwise specified on order for boiler. Top Smoke Outlets or Side Smoke Outlets of the size shown will be furnished without extra charge, if specified on order for boiler.

For additional information on the above and other Heating Boilers, write to the Home Office of the Lookout Boiler & Manufacturing Company at Chattanooga, Tennessee.

National Radiator Corporation

THE MARK OF QUALITY PRODUCTS

NATIONAL RADIATOR CORPORATION

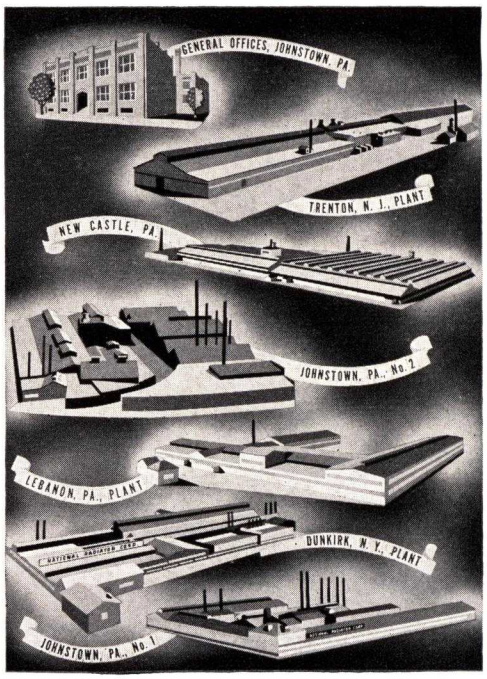
GENERAL OFFICES

JOHNSTOWN, PA.

THE INSTITUTION BEHIND THE PRODUCT

THE NATIONAL RADIATOR CORPORATION is among the oldest manufacturers of radiators, boilers and air conditioning equipment. A plumbing shop in 1879 — a large corporation with many manufacturing plants, warehouses and branch sales offices today. This expansion with constant increasing sales volume results from the acceptance of practical experience behind tested quality products.

THE NATIONAL RADIATOR CORPORATION has been a leader in the heating industry. It was the first to offer tube type radiation . . . the first to successfully use push nipple construction in radiation . . . the first to develop an all cast iron convector and the first to offer a truly artistic small tube type radiator. The many other contributions its engineers have made toward advancing the boiler and radiator industry are legend.



Today the NATIONAL RADIATOR CORPORATION is ready to serve the architect and engineer with a staff of representatives who have made a complete study of the design, application and performance of convectors, steel boilers, gas boilers, oil heating units and air conditioning equipment. Each is a specialist in his particular field supported by a thorough understanding of heating problems gained through years of experience. They are at your service.

NATIONAL SERVICE THROUGH THESE BRANCH OFFICES AND WAREHOUSES

BALTIMORE, MD.—Office and Warehouse—2622 Matthews St.

BOSTON, MASS.—Office and Warehouse—Ivaloo and Park Sts., Somerville, Mass. Warehouse—Framingham, Mass.

BUFFALO, N. Y.—Office—904 Main St. Warehouse — North Tonawanda, N. Y.

CHICAGO, ILL.—Office and Warehouse—1111 E. 83rd St.

CINCINNATI, OHIO—Office and Warehouse — Powers St. and B. & O. Railroad

CLEVELAND, OHIO—Office—4500 Euclid Ave.

DETROIT, MICH.—Office and Warehouse—5736 Twelfth St.

JOHNSTOWN, PA.—Office—221 Central Ave. Warehouse—Central Ave. and Ohio St.

*LEBANON, PA.—Office and Warehouse—14th and Buttonwood Sts.

MILWAUKEE, WIS.—Office and Warehouse — 431 N. Fifth St.

NEWARK, N. J.—Office and Warehouse—574 Ferry St.

NEW YORK, N. Y.—Office and Warehouse—30-20 Thomson Ave., Long Island City, N. Y.

PHILADELPHIA, PA.—Office and Warehouse—2124 Arch St. Warehouse—E. State St. and Whitehead Rd., Trenton, N. J.

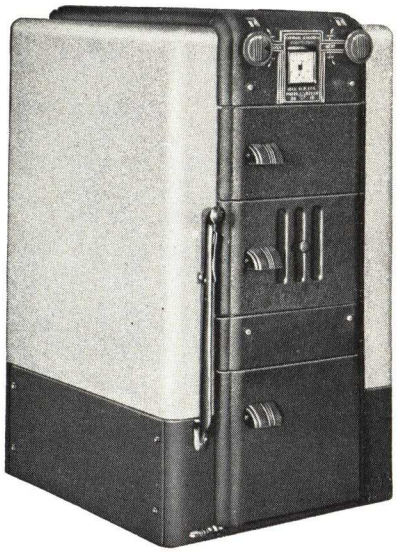
PITTSBURGH, PA.—Office—336 Third Ave. Warehouse—New Castle, Pa.

RICHMOND, VA.—Office—3032 Norfolk St.

WASHINGTON, D. C.—Office and Warehouse—600 "W" Street, N. E.

**Steel Boilers Only*

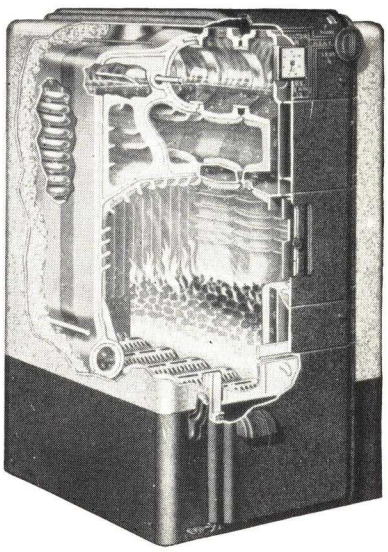
NATIONAL BONDED HEAT EXTRACTOR BOILER—FOR HAND FIRING



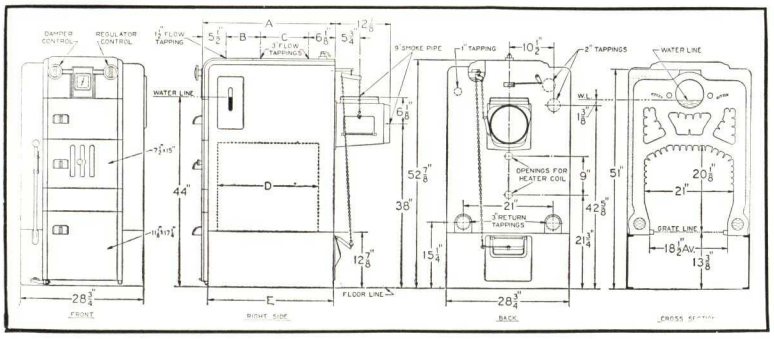
The National Multi-finger Heat Extractor Boiler is not "just another boiler" revamped from an older model to provide something new to sell, but has been designed to meet a definite need.

Specialized boilers for oil and stoker firing have been developed during recent years to meet the desire for automatic heating. Due to changes in the relative costs of different kinds of fuels, owners often wish to change from one fuel to another or, from hand firing to automatic firing. The specialized boiler did not always permit such a change, or if it did, great expense and the sacrifice of efficiency was involved.

In designing the National Multi-finger Heat Extractor Boiler, National's engineers first determined the requisites of a boiler to operate efficiently when hand-fired, when stoker-fired and when used with an oil burner. The requisites of these three types of boilers were combined in the Multi-finger Heat Extractor Boiler, which is really three boilers in one, assuring the purchaser that he will obtain high efficiency regardless of which method of firing he may select.

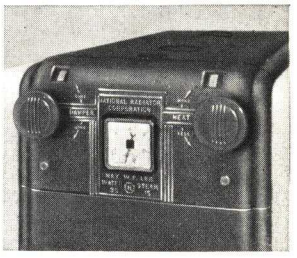


Dimensions

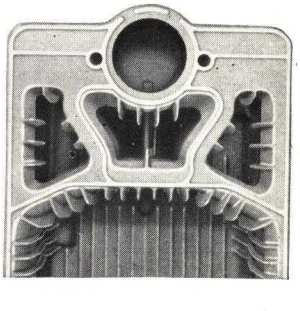


SIZES AND RATINGS

Boiler No.		A	B	C	D	E	No. and size of tappings	
Steam	Water						Flow	Return
AH- 4-S	AH- 4-W	18 7/8"	7 1/4"	....	11 1/2"	17 1/4"	1-1 1/2" 1-3"	2-3"
AH- 5-S	AH- 5-W	22 7/8"	11 1/4"	....	15 1/2"	21 1/4"	1-1 1/2" 1-3"	2-3"
AH- 6-S	AH- 6-W	26 7/8"	15 1/4"	....	19 1/2"	25 1/4"	1-1 1/2" 1-3"	2-3"
AH- 7-S	AH- 7-W	30 7/8"	8"	11 1/4"	23 1/2"	29 1/4"	1-1 1/2" 2-3"	2-3"
AH- 8-S	AH- 8-W	34 7/8"	8"	15 1/4"	27 1/2"	33 1/4"	1-1 1/2" 2-3"	2-3"
AH- 9-S	AH- 9-W	38 7/8"	8"	19 1/4"	31 1/2"	37 1/4"	1-1 1/2" 2-3"	2-3"
AH-10-S	AH-10-W	42 7/8"	8"	23 1/4"	35 1/2"	41 1/4"	1-1 1/2" 2-3"	2-3"



Draft regulating devices are adjusted on the radio dial principle. Control knobs operate indicating dials which bear number graduations to show the relative setting of the damper regulator and smokehood damper.



Unusual shape of the flueways provides a large ratio of perimeter or surface to area, with a large proportion of the surface at the top where the gases are hottest.

A light step on the foot treadle and the ashpit door swings open. The large door makes the removal of ashes easy. A light push and the door closes — held fast by an invisible lock.

Steam Boilers

Boiler No.	Available output rating, sq. ft.	Bonded load rating, sq. ft.	Grate area, sq. ft.	Fuel capacity, lbs.	Fuel available, lbs.	Outlets number and size, in.	Inlets number and size, in.	Chimney Size, in.	Chimney Height, ft.
AH- 4-S	450	225	1.70	120	94	1-3	2-3	8x 8	30
AH- 5-S	630	315	2.25	167	130	1-3	2-3	8x 8	30
AH- 6-S	800	400	2.80	214	166	1-3	2-3	8x12	35
AH- 7-S	980	490	3.35	261	202	2-3	2-3	8x12	35
AH- 8-S	1150	575	3.90	308	238	2-3	2-3	8x12	35
AH- 9-S	1330	665	4.45	355	274	2-3	2-3	8x12	35
AH-10-S	1500	750	5.00	402	310	2-3	2-3	8x12	35

Water Boilers

AH- 4-W	720	360	1.70	120	94	1-1 1/2 & 1-3	2-3	8x 8	30
AH- 5-W	1000	500	2.25	167	130	1-1 1/2 & 1-3	2-3	8x 8	30
AH- 6-W	1280	640	2.80	214	166	1-1 1/2 & 1-3	2-3	8x12	35
AH- 7-W	1560	780	3.35	261	202	1-1 1/2 & 2-3	2-3	8x12	35
AH- 8-W	1840	920	3.90	308	238	1-1 1/2 & 2-3	2-3	8x12	35
AH- 9-W	2120	1060	4.45	355	274	1-1 1/2 & 2-3	2-3	8x12	35
AH-10-W	2400	1200	5.00	402	310	1-1 1/2 & 2-3	2-3	8x12	35

For complete information request catalogue Form 292-A.

NATIONAL BONDED HEAT EXTRACTOR BOILER — FOR MECHANICAL FIRING

SERIES AM — STOKER FIRED — SIZES AND RATINGS

Boiler No.		Available output rating			Bonded Load Rating		Combustion chamber volume from bottom of sections to crown, cu. ft.	Minimum recommended coal input per hour	
Steam	Water	B.t.u.	Steam, sq. ft.	Water, sq. ft.	Steam, sq. ft.	Water, sq. ft.		B.t.u.	Lbs.
AM- 6-S	AM- 6-W	148,700	620	1055	430	690	4.7	228,700	19
AM- 7-S	AM- 7-W	175,700	725	1205	505	805	5.7	270,300	22
AM- 8-S	AM- 8-W	198,200	825	1350	575	920	6.7	304,800	25
AM- 9-S	AM- 9-W	226,200	930	1500	650	1035	7.7	348,000	28
AM-10-S	AM-10-W	248,600	1030	1645	720	1150	8.7	382,300	31

(1) Recommended inputs are based on anthracite coal of 12,500 B.t.u./lb.

SERIES AO — OIL FIRED — SIZES AND RATINGS

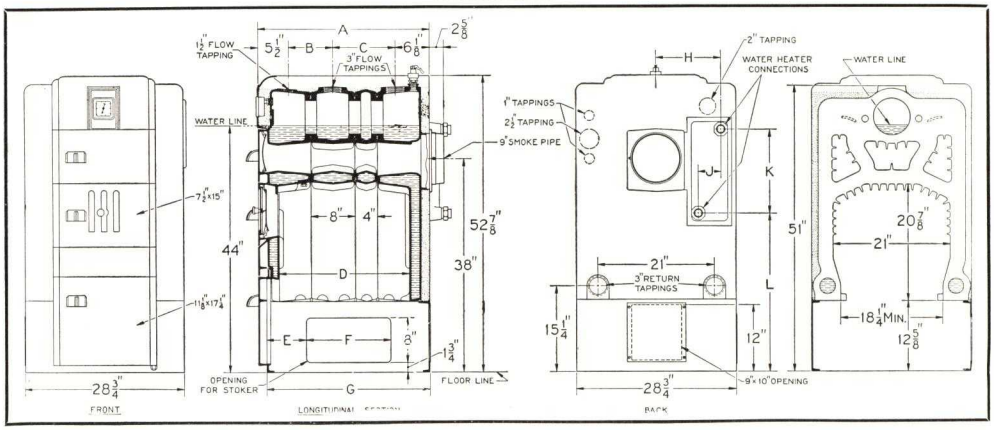
Boiler No.		Heating surface, sq. ft.	Available output rating			Bonded Load Rating		Minimum recommended oil input per hour		
Steam	Water		B.t.u.	Steam, sq. ft.	Water, sq. ft.	Steam, sq. ft.	Water, sq. ft.	B.t.u.	Lbs.	Gal.
AO- 5-S	AO- 5-W	27.8	125,300	520	910	360	575	165,800	8.7	1.18
AO- 6-S	AO- 6-W	32.8	148,700	620	1055	430	690	196,800	10.3	1.40
AO- 7-S	AO- 7-W	39.0	175,700	725	1205	505	805	234,200	12.2	1.66
AO- 8-S	AO- 8-W	44.0	198,200	825	1350	575	920	264,200	13.8	1.87
AO- 9-S	AO- 9-W	50.3	226,200	930	1500	650	1035	301,400	15.7	2.13
AO-10-S	AO-10-W	55.3	248,600	1030	1645	720	1150	331,400	17.3	2.35

(1) Available output ratings are figured on 4500 B.t.u. per hour per square foot of heating surface heat transmission rate.

(2) The Bonded Load Ratings represent the actual installed cast iron radiation plus the domestic hot water load. To express water heater load in terms of square feet of radiation, figure each gallon of storage tank capacity as equivalent to 1 sq. ft. of steam radiation or 1.6 sq. ft. of hot water radiation. If Biltin Tankless Heater is used add 50 sq. ft. steam radiation or 80 sq. ft. water radiation per bathroom to installed radiation before selecting boiler size. Allowance for piping and pick-up is made in the Bonded Load Ratings for average installations. If piping load is excessive, additional allowance should be made.

(3) Minimum recommended oil input is based on oil of 19,200 B.t.u. per lb. and 7.35 lbs. per gal.

Dimensions



Boiler No.		A	B	C	D	*E	*F	G	No. and size of tappings	
Steam	Water								Flow	Return
AO-5-S	AO-5-W	22⅞"	11¼"	.....	15½"	.....	.....	21¼"	1-1½" 1-3"	2-3"
AO or AM- 6-S	AO or AM- 6-W	26⅞"	15¼"	.....	19½"	5⅛"	15¼"	25¼"	1-1½" 1-3"	2-3"
AO or AM- 7-S	AO or AM- 7-W	30⅞"	8"	11¼"	23½"	7⅛"	15¼"	29¼"	1-1½" 2-3"	2-3"
AO or AM- 8-S	AO or AM- 8-W	34⅞"	8"	15¼"	27½"	5⅝"	22¼"	33¼"	1-1½" 2-3"	2-3"
AO or AM- 9-S	AO or AM- 9-W	38⅞"	8"	19¼"	31½"	7⅝"	22¼"	37¼"	1-1½" 2-3"	2-3"
AO or AM-10-S	AO or AM-10-W	42⅞"	8"	23¼"	35½"	9⅝"	22¼"	41¼"	1-1½" 2-3"	2-3"

*Stoker boilers only.

WATER HEATERS

Hand Fired Boilers (steam only): No. 757 storage type heater is furnished as standard equipment. Nos. 904, 907 and 1213 storage type are furnished as optional at extra cost.

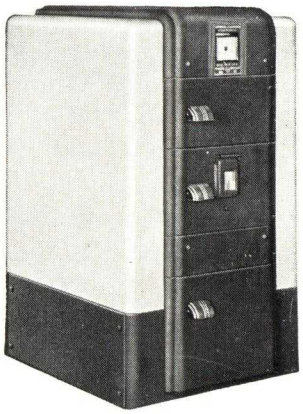
Stoker and Oil Fired: No. 904 storage type heater furnished as standard equipment. Nos. 907 and 1213 storage type and two sizes of tankless type heaters are available as optional equipment at extra cost. All sizes are Taco Heaters.

Ratings: No. 757, 40 gal. (boiler water 212° F.); No. 904, 44 gal.; No. 907, 100 gal.; and No. 1213, 160 gal. (boiler water 180° F.) based 40° to 140° F. rise in three hours. Tankless: No. 1219, 180 gal.; No. 1219-A, 210 gal. in one hour based on 40° to 140° F. temperature rise with boiler water at 180° F.

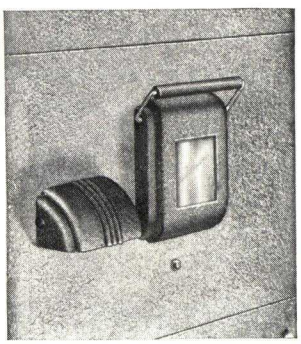
DIMENSIONS IN INCHES

	Medium capacity No. 904	High capacity No. 907	Tankless
H	11 5/16"	11 5/8"	11 5/8"
J	3½"	4⅛"	4⅛"
K	9 3/8"	15"	15"
L	33 13/16"	28 3/16"	28 3/16"
Size of connections	¾"	1"	¾"

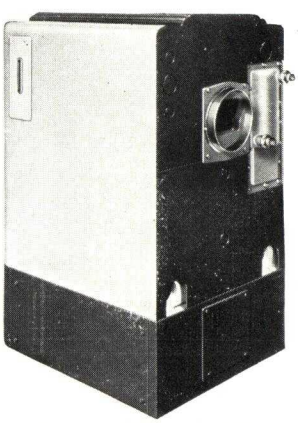
Series AM



Series AO

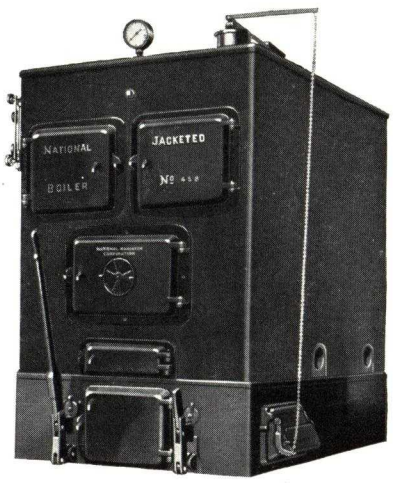


Observation Port Series AO

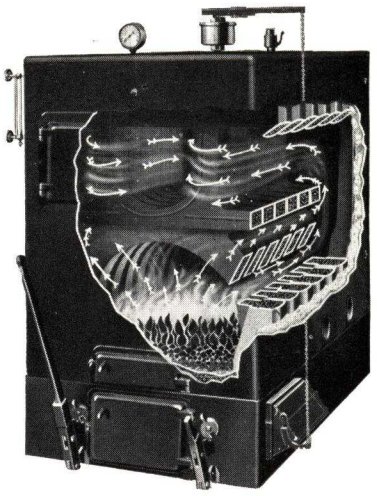


Series AM and AO

NATIONAL BONDED JACKETED BOILER — No. 4 SERIES



A bond by a nationally known, independent surety company is issued with National cast iron boilers. It contains four distinct guaranteed stipulations as to the performance, manufacture, testing and replacement of defective parts. In order to remove any uncertainty regarding the amount of direct cast iron radiation which each National Bonded Boiler is guaranteed to heat, the net radiator loads under the heading "Bonded Direct Cast Iron Radiation," are shown herein. An allowance for normal piping is included in the bonded load. If the surface of the piping exceeds 25% of the Direct Cast Iron Radiation for steam or 35% for water, additional allowance should be made for the extra surface. The bonded loads have been established on the basis that 1 sq. ft. of direct cast iron steam radiation will emit 240 B.t.u. per hour and that 1 sq. ft. of hot water radiation will emit 150 B.t.u. per hour.



RATINGS AND BOILER DATA — STEAM AND WATER

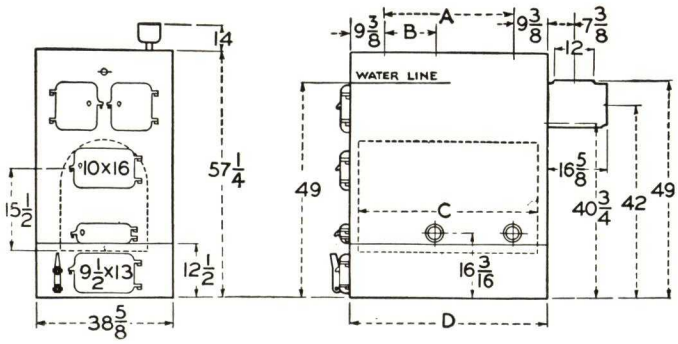
Steam			Water			General (Steam and Water)					
										Chimney	
Boiler No.	Available output rating, sq. ft.	Bonded direct cast iron radiation, sq. ft.	Boiler No.	Available output rating, sq. ft.	Bond ed direct cast iron radiation, sq. ft.	Grate area, sq. ft.	Fuel capacity, lbs.	Outlets, number and size	Inlets, number and size	Area, in.	Height, ft.
4-S-5	1,475	700	4-W-5	2,400	1,150	4.78	324	2–4″	2–4″	12 x 12	30
4-S-6	1,800	875	4-W-6	2,900	1,440	5.95	403	2–4″	2–4″	12 x 12	35
4-S-7	2,125	1,050	4-W-7	3,500	1,730	7.12	482	3–4″	4–4″	12 x 12	35
4-S-8	2,450	1,225	4-W-8	4,000	2,020	8.29	561	3–4″	4–4″	12 x 12	40
4-S-9	2,775	1,400	4-W-9	4,500	2,310	9.46	640	3–4″	4–4″	12 x 16	45

The number of square feet of direct cast iron radiation each boiler is bonded to heat is listed under the heading "Bonded Direct Cast Iron Radiation, Square Feet." For comparison with similarly rated boilers "Available Output" ratings are also shown.

Distance from center of one section to center of section next to it 6⅞ in.

Return Inlet Tappings: One on each side of next-to-back section "RU." Additional inlet tappings on each side of intermediate outlet section "R" in 7, 8, and 9 section boilers.

DIMENSIONS — STEAM AND WATER



Boiler No.		A	B	C	D
4-S-5	4-W-5	13 3/4″	....	28 1/8″	33 1/4″
4-S-6	4-W-6	20 5/8″	....	35″	40 1/8″
4-S-7	4-W-7	27 1/2″	13 3/4″	42 7/8″	47″
4-S-8	4-W-8	34 3/8″	13 3/4″	49 3/4″	53 7/8″
4-S-9	4-W-9	41 1/4″	20 5/8″	56 5/8″	60 3/4″

Measurements are subject to slight variations in assembly.

Indirect External Water Heater Tapping: One 2-in. tapping located in rear of back boiler section. Bosses for additional 1½-in. tappings located on both sides of all intermediate sections on line with lower gauge cock tapping can be furnished.

NATIONAL BONDED SECTIONAL AND SUPER-SMOKELESS BOILERS

The National line of unjacketed, sectional cast iron boilers begins with the Novus 25 series which is the same as the No. 4 Series Jacketed boiler, except that it is fitted with an overhead damper control and is shipped less the jacket.

Series 32 boilers are similar to Series 33 Super-Smokeless boilers, ratings and measurements for which are shown on the following page, except that Series 32 boilers are not fitted with smokeless device. Bonded ratings range from 1,200 to 2,400 sq. ft. for steam and 1,980 to 3,960 for water.

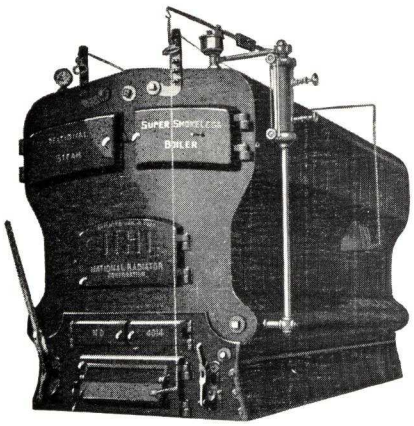
Series 42 boilers are similar to Series 40 Super-Smokeless boilers, ratings and measurements for which are shown on the second following page, except that Series 42 boilers are not fitted with smokeless device. Bonded ratings range from 2,200 to 6,700 sq. ft. for steam and 3,625 to 11,000 sq. ft. for water.

National Novus Series 48 boilers are furnished in both the hard coal and Super-Smokeless types. Bonded ratings for hard coal type ranges from 3,500 to 7,000 sq. ft. for steam and 5,750 to 11,500 sq. ft. for water. Bonded ratings for Super-Smokeless type range from 4,200 to 9,000 sq. ft. for steam and 6,900 to 14,700 sq. ft. for water.

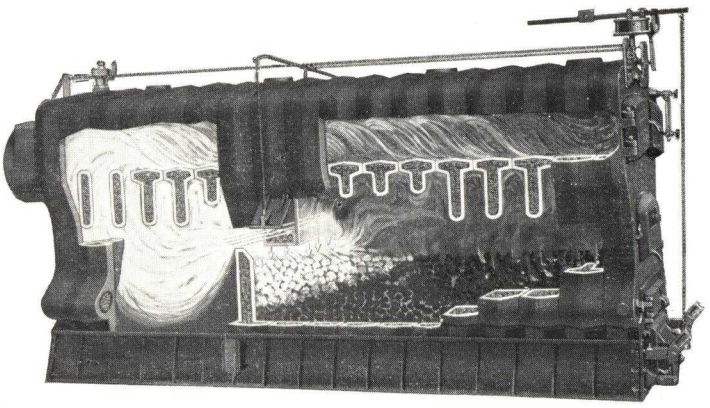
National Duplex Super-Smokeless boiler has the same smokeless appliance as Series 40 Super-Smokeless. The duplex series is really two Series 40 boilers joined with special plate work. Bonded ratings range from 5,600 to 16,600 sq. ft. for steam and 9,220 to 27,390 sq. ft. for water.

National Low Water Line Boiler is made in two series — both in hard coal and smokeless types. Water line of Series 30 is 43 in. and bonded ratings range from 850 to 2,600 sq. ft. for steam and 1,400 to 4,305 sq. ft. for water. Series 40 boilers have a water line of 47 in. and bonded ratings from 1,800 to 6,600 sq. ft. for steam and 2,970 to 10,890 sq. ft. for water.

NATIONAL SUPER-SMOKELESS BOILERS — SERIES 33 AND 40



Secondary air is pre-heated while passing through patented air gate section. It is mixed intimately with the hot gases, being delivered in fine, high velocity jets distributed across full width of firebox. The pre-heated air causes gases to burn at very high temperatures.



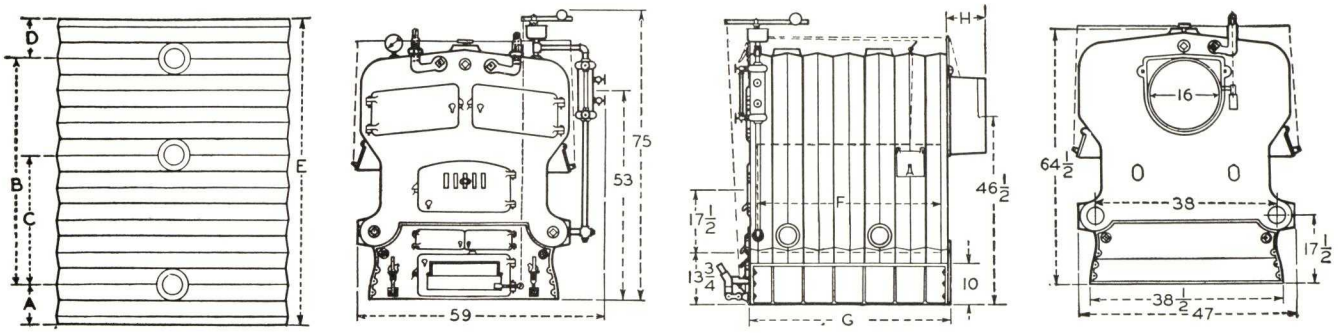
SERIES No. 33 — STEAM, VAPOR AND WATER — RATINGS AND BOILER DATA

Steam				Water				General (Steam and Water)				
Boiler No.	Available output rating, sq. ft.	Bonded direct cast iron radiation, sq. ft.	Inlets, number and size	Boiler No.	Available output rating, sq. ft.	Bonded direct cast iron radiation, sq. ft.	Inlets, number and size	Grate area, sq. ft.	Outlets, number and size	Chimney Area, in.	Chimney Height, ft.	†Covering surface, sq. ft.
S-335	2,900	1,300	2–4″	W-335	4,650	2,150	2–4″ 2–5″	7.32	1–5″	14 x 14	40	42
S-336	3,600	1,650	2–4″	W-336	5,800	2,725	2–4″ 2–5″	9.10	2–5″	15 x 15	40	51
S-337	4,300	2,000	2–4″	W-337	6,950	3,300	2–4″ 2–5″	10.87	2–5″	16 x 16	40	60
S-338	5,000	2,350	2–4″	W-338	8,100	3,875	2–4″ 2–5″	12.65	2–5″	16 x 16	50	69
S-339	5,700	2,700	2–4″	W-339	9,250	4,450	2–4″ 2–5″	14.42	3–5″	18 x 18	50	78
S-3310	6,400	3,050	2–4″	W-3310	10,400	5,025	2–4″ 2–5″	16.20	3–5″	18 x 18	55	87

The square feet of direct cast iron radiation each boiler is bonded to heat is listed under the heading "Bonded Direct Cast Iron Radiation, Square Feet." For comparison with similarly rated boilers "Available Output" ratings are also shown.

†Square feet of exterior boiler surface. Approximately 60 lbs. of insulation per section required to cover boiler 1½ in. thick. 100 lbs. of insulation will cover approximately 15 sq. ft. of boiler surface to a thickness of 1½ in.

DIMENSIONS — STEAM AND WATER



Boiler No.	A	B	C	D	E	F	G	H
335	18⅝″	.....	.....	18⅝″	37¼″	32½″	38¼″	10½″
336	10⅜″	16½″	.....	18⅝″	45½″	40¾″	46½″	10½″
337	10⅜″	24¾″	.....	18⅝″	53¾″	49″	54¾″	10½″
338	10⅜″	24¾″	.....	26⅞″	62″	57¼″	63″	10½″
339	10⅜″	49½″	24¾″	10⅜″	70¼″	65½″	71¼″	10½″
3310	10⅜″	57¾″	24¾″	10⅜″	78½″	73¾″	79½″	10½″

Measurements subject to slight variations in assembly.

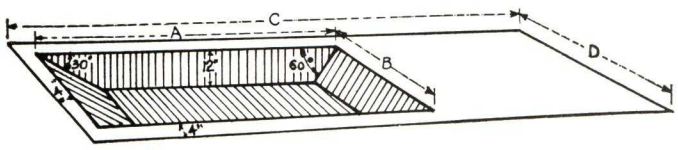
Distance from center of one secton to center of section next to it is 8¼ in.

Steam Return Inlet Tappings: Two 4-in. in rear of back section "B." Side return inlets on steam boilers are only furnished on special order.

Water Return Inlet Tappings: Two 4-in. in rear of back section "B." Additional 5-in. return inlets on each side of intermediate supply outlet section "HR."

Indirect External Water Heater Tapping: One 2-in. tapping located in rear of back boiler section. Bosses for additional 1½-in. tappings located on both sides of all intermediate sections on line with lower gauge cock tapping can be furnished.

ASH PIT RECOMMENDATIONS, STEAM AND WATER



The tables give all the necessary measurements for pitting the National Super-Smokeless Boiler. Letters refer to corresponding letters on the diagram.

Boiler No.	Measurement of pit under ash pit		Dimensions of Foundation	
	A	B	C	D
335	34″	33½″	43″	41½″
336	42¼″	33½″	51¼″	41½″
337	50½″	33½″	59½″	41½″
338	58¾″	33½″	67¾″	41½″
339	67″	33½″	76″	41½″
3310	75¼″	33½″	84¼″	41½″

NATIONAL BONDED SUPER-SMOKELESS BOILERS — SERIES 40

RATINGS AND BOILER DATA — STEAM AND WATER

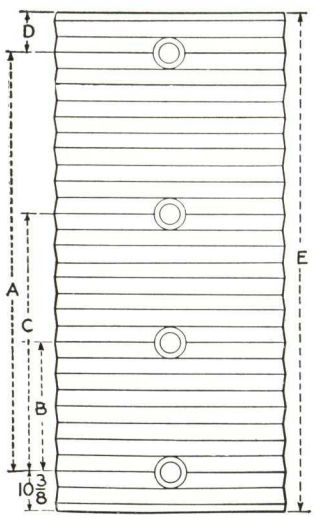
Steam				Water				General (Water and Steam)				
Boiler No.	Available output rating, sq. ft.	Bonded direct cast iron radiation, sq. ft.	Inlets, number and size	Boiler No.	Available output rating, sq. ft.	Bonded direct cast iron radiation, sq. ft.	Inlets, number and size	Grate area, sq. ft.	Outlets, number and size	Chimney		†Covering surface, sq. ft.
										Area, in.	Height, ft.	
S-406	5,200	2,300	2–4″	W-406	8,300	3,795	2–4″ 2–5″	12.03	2–5″	16 x 16	50	56
S-407	6,200	2,800	2–4″	W-407	9,900	4,620	2–4″ 2–5″	14.38	3–5″	18 x 18	50	66
S-408	7,200	3,300	2–4″	W-408	11,500	5,445	2–4″ 2–5″	16.73	3–5″	18 x 18	55	76
S-409	8,200	3,800	2–4″	W-409	13,100	6,270	2–4″ 2–5″	19.08	3–5″	20 x 20	55	86
S-4010	9,200	4,300	2–4″	W-4010	14,700	7,095	2–4″ 2–5″	21.43	3–5″	20 x 20	60	96
S-4011	10,200	4,800	2–4″	W-4011	16,300	7,920	2–4″ 2–5″	23.77	3–5″	21 x 21	60	106
S-4012	11,200	5,300	2–4″	W-4012	17,900	8,745	2–4″ 4–5″	21.43	4–5″	22 x 22	65	116
S-4013	12,200	5,800	2–4″	W-4013	19,500	9,570	2–4″ 4–5″	21.43	4–5″	22 x 22	70	126
S-4014	13,000	6,300	2–4″	W-4014	20,800	10,395	2–4″ 4–5″	23.77	4–5″	23 x 23	75	136
S-4015	13,800	6,800	2–4″	W-4015	22,100	11,220	2–4″ 4–5″	23.77	4–5″	23 x 23	75	146
S-4016	14,600	7,300	2–4″	W-4016	23,400	12,045	2–4″ 4–5″	23.77	4–5″	24 x 24	80	156
S-4017	15,400	7,800	2–4″	W-4017	24,700	12,870	2–4″ 4–5″	23.77	4–5″	24 x 24	80	166
S-4018	16,200	8,300	2–4″	W-4018	26,000	13,695	2–4″ 4–5″	23.77	4–5″	25 x 25	80	176

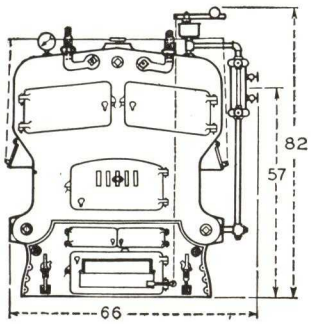
The number of square feet of direct cast iron radiation each boiler is bonded to heat is listed under the heading "Bonded Direct Cast Iron Radiation, Square Feet." For comparison with similarly rated boilers "Available Output" ratings are also shown.

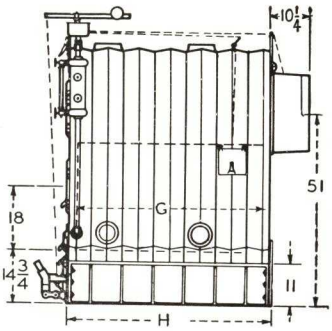
†Square feet of exterior boiler surface.

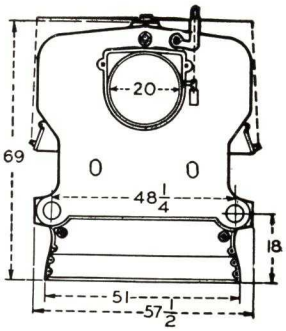
Approximately 67 lbs. of insulation per section required to provide boiler covering 1½ in. thick.

DIMENSIONS — STEAM AND WATER









Distance from center of one section to center of section next to it is 8¼ in.

Steam Return Inlet Tappings: Two 4 in. in rear of back section. "B." Side return inlets on steam boilers are only furnished on special order.

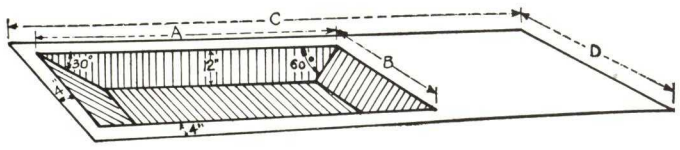
Water Return Inlet Tappings: Two 4-in. in rear of back section "B." Additional 5-in. return inlets on both sides of each intermediate supply section "HR."

Indirect External Water Heater Tapping: One 2-in. tapping located in rear of back boiler section. Bosses for additional 1½-in. tappings located on both sides of all intermediate sections on line with lower gauge cock tappings can be furnished.

Boiler No.	A	B	C	D	E	G	H
406	24 3/4	....	....	10 3/8	45 1/2	40 3/4	47
407	33	16 1/2	....	10 3/8	53 3/4	49	55 1/4
408	41 1/4	16 1/2	....	10 3/8	62	57 1/4	63 1/2
409	49 1/2	24 3/4	....	10 3/8	70 1/4	65 1/2	71 3/4
4010	57 3/4	33	....	10 3/8	78 1/2	73 3/4	80
4011	57 3/4	33	....	18 5/8	86 3/4	82	88 1/4
4012	74 1/4	33	57 3/4	10 3/8	95	73 3/4	96 1/2
4013	74 1/4	33	57 3/4	18 5/8	103 1/4	73 3/4	104 3/4
4014	82 1/2	41 1/4	66	18 5/8	111 1/2	82	113
4015	90 3/4	41 1/4	66	18 5/8	119 3/4	82	121 1/4
4016	99	41 1/4	66	18 5/8	128	82	129 1/2
4017	107 1/4	41 1/4	66	18 5/8	136 1/4	82	137 3/4
4018	115 1/2	41 1/4	66	18 5/8	144 1/2	82	146

Measurements subject to slight variations in assembly.

ASH PIT FOUNDATION RECOMMENDATIONS — STEAM AND WATER

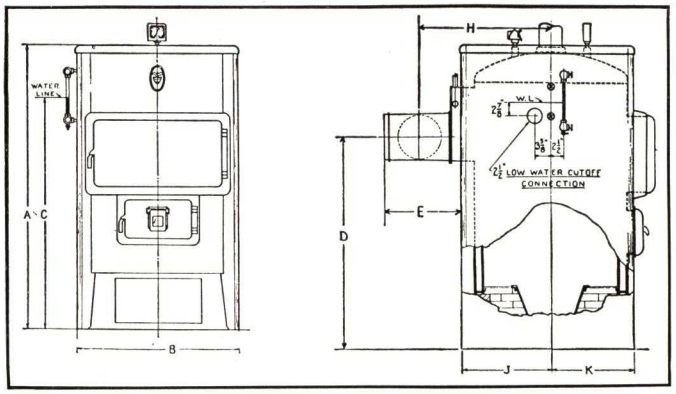


Tables give all necessary measurements for pitting the National Super-Smokeless Boiler. Letters refer to corresponding letters on diagram.

When boiler is erected before basement floor is laid, surround pit with foundation 10 to 12 in. wide.

Boiler No.	Measurement of pit under ash pit		Dimensions of foundation	
	A	B	C	D
406	42 1/4″	46″	51 1/4″	54″
407	50 1/2″	46″	59 1/2″	54″
408	58 3/4″	46″	67 3/4″	54″
409	67″	46″	76″	54″
4010	75 1/4″	46″	84 1/4″	54″
4011	83 1/2″	46″	92 1/2″	54″
4012	75 1/4″	46″	100 3/4″	54″
4013	75 1/4″	46″	109″	54″
4014	83 1/2″	46″	117 1/4″	54″
4015	83 1/2″	46″	125 1/2″	54″
4016	83 1/2″	46″	133 3/4″	54″
4017	83 1/2″	46″	142″	54″
4018	83 1/2″	46″	150 1/4″	54″

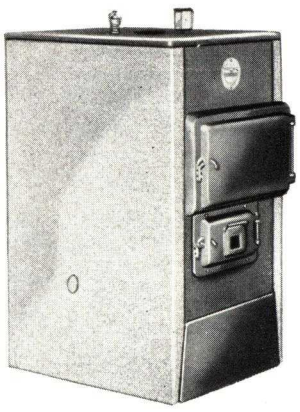
NATIONAL PREMIER VERTICAL STEEL BOILERS—STOKER AND OIL FIRED TYPES FOR RESIDENTIAL USE



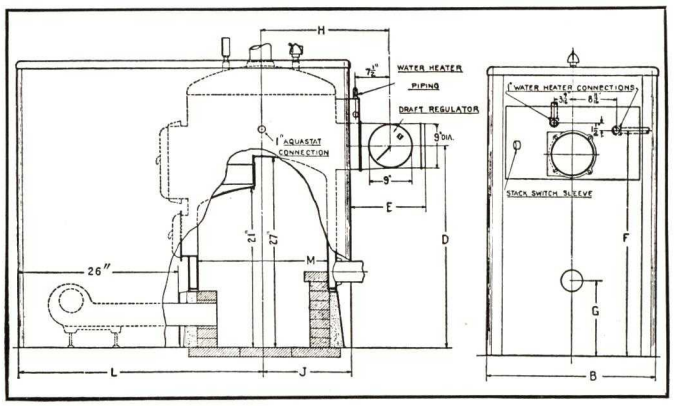
Standard Equipment—Base assembled, fire and flue doors with frames, No. 66DB McDonnel & Miller low water cut-off, self-controlled draft adjuster, 1½-in. washout plugs, 2 aquastat tappings, turbulators, National pyrex observation port and No. 75 Taco storage type indirect hot water heater.

Trimmings for Steam Boilers—Steam gauge, water gauge, glass and gauge cocks and pop safety valve.

Trimmings for Water Boilers—Combination altitude gauge and thermometer. Knockout discs are provided in jackets opposite boiler tappings.



Dimensions

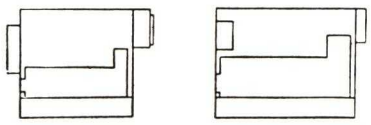


	Measurements	Boiler VP23	Boiler VP26
A	Height overall	58″	58″
B	Width at base	34″	34″
C	Water line	47½″	47½″
D	Smoke outlet height	40⅞″	40⅞″
E	Smoke hood extension	15¼″	15¼″
F	Water heater—inlet connection	45½″	45½″
G	Return connection height	15½″	15½″
H	Distance side or top smoke outlet to center line of boiler	26¼″	26¼″
J	Jacket length—back end—regular and DeLuxe	17¾″	17¾″
K	Jacket length—front end—regular	16¼″	16¼″
L	Jacket length—front end—DeLuxe	43″	43″
M	Boiler shell—inside diameter	23″	26″
	Smoke outlet diameter	9″	9″
	Steam or flow outlet size	4″	4″
	Return connection size	4″	4″
	Chimney size	9″	9″
	Chimney height	30′	35′
	Furnace volume, cu. ft.	6.3	7.4
	Heating surface, sq. ft.	33	40
	Outside surface to cover, sq. ft.	40	40

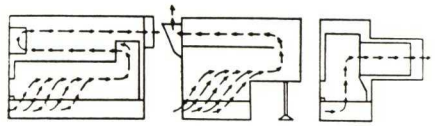
RATINGS—HOT WATER HEATER CAPACITIES

Boiler No.	*S.H.B.I. Rating		Indirect Water Heaters—Gallons Heated 40° F. to 140° F.					
			Storage Tank Type			Tankless Type		
	Steam, sq. ft.	Water, sq. ft.	No.	Per 3 hrs. in boiler water		No.	180° F. boiler water	
				212° F.	180° F.		1 hour	1 minute
VP-23	540	860	75	75	55	180	180	3.0
VP-26	680	1090	110	110	75			
			150	150	110			

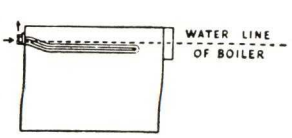
NATIONAL PREMIER COMMERCIAL SERIES STEEL BOILER FEATURES



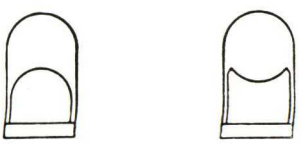
Recessed Front Chamber—The hot gases, after passing to the front of the boiler, must reverse their direction in a smoke chamber. Manufacturing economies can be effected by making this chamber a projecting sheet metal box—but this construction wastes heat into the boiler room; while the projecting heat interferes with boiler tending. The National Premier has a flush front, with a recessed chamber, water-jacketed on five sides.



Three-pass Flue Construction—These diagrams illustrate the types of fire travel generally found in steel boilers, and show at a glance the superiority of the National three-pass arrangement. In the one-pass boiler, the flue gases pass quickly through the boiler, and immediately reach the stack; the two-pass provides a longer travel. But only in the three-pass are the flue gases forced to take the long, circuitous route which will assure maximum heat transfer.



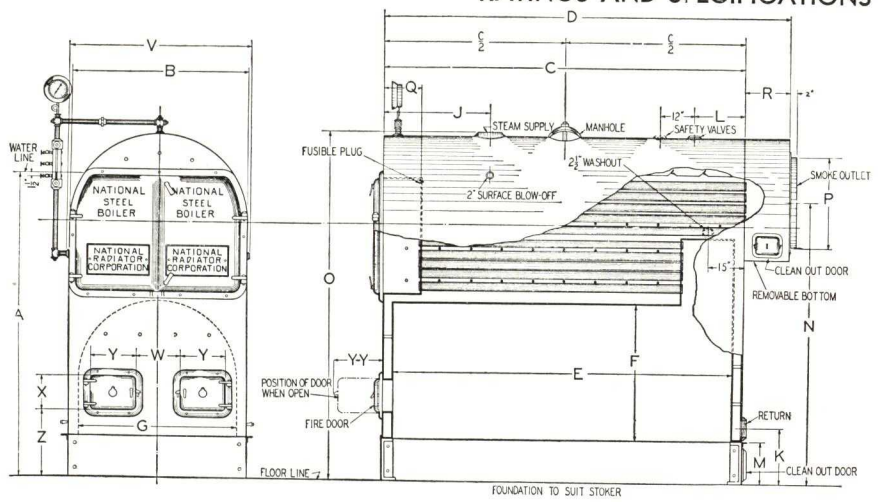
Indirect Water Heater—In the National Premier Steel Boiler, provision can be made for inserting the coils of an indirect water heater, if desired. Domestic water heating is thus handled by the boiler, saving a large part of the money otherwise spent for such service.



True Arch Crown Sheet Construction—The National Premier Steel Boiler has a True Arch crown sheet. Its advantages are obvious. The inverted, or bag type, may permit sludge and sediment to accumulate. Such an accumulation acts as an insulator. In True Arch construction, sediment cannot accumulate at the danger points.

NATIONAL PREMIER STEEL BOILERS — COMMERCIAL SERIES

RATINGS AND SPECIFICATIONS



All Commercial Series National Premier Steel Boilers are constructed for 15 lbs. steam or 30 lbs. water working pressure in accordance with the Steel Heating Boiler Code of the A.S.M.E. Special boilers can be built for 80 lbs. water working pressure. All ratings are in accordance with the Industry's Simplified Practice Recommendations R157-35, as issued by the U. S. Department of Commerce.

Other base heights available—
Boilers No. 374 to 495, inclusive—15", 17", 18".
Boilers No. 553 to 613, inclusive—17", 18".
Boilers No. 673 to 855, inclusive—17", 18", 21".
If these bases are substituted for base regularly supplied, increase all height dimensions accordingly.

Standard Equipment—All-metal base with or without front base panel; fire door, liner and frame; flue doors and frame; smokebox cleanout doors; tube scraper.

Standard Trimmings—Water column, water gauge and gauge cocks (no water column piping furnished); 5-in. diameter steam gauge and siphon with boilers up to and including 55 in. wide, 8½-in. diameter steam gauge and siphon with larger boilers; safety valve set to blow at 10 or 15-lb. pressure. No trimmings furnished with hot water boilers.

Note—Boilers 55 in. wide and larger have manhole in top of boiler. All boilers have handhole openings for cleaning purposes.

TYPE MB—SOLID FUELS—STOKER FIRED

Boiler No.	*MB-317	*MB-318	MB-374	MB-375	MB-376	MB-434	MB-435	MB-436	MB-494	MB-495	MB-553	MB-554	MB-613	MB-673	MB-674	MB-733	MB-793	MB-854	MB-855
S.H.B.I. Rating—																			
Steam sq. ft.	2190	2680	3160	3650	4250	4860	5470	6080	7290	8500	10330	12150	15180	18220	21250	24290	30360	36430	42500
Water sq. ft.	3500	4280	5050	5840	6800	7770	8750	9720	11660	13600	16520	19440	24280	29150	34000	38860	48570	58280	68000
Heating surface sq. ft.	129	158	186	215	250	286	322	358	429	500	608	715	893	1072	1250	1429	1786	2143	2500
Furnace volume cu. ft.	17.6	21.4	25.3	29.2	34.0	38.9	43.8	48.7	58.4	68.0	82.7	97.2	121.5	145.8	170.0	194.3	242.9	291.5	340.0
A—Wat. line hgt. ft.-in.	4-10	4-10	5-10	5-11½	6-0	6-1½	6-2½	6-2½	7-1½	7-3	7-7½	7-10	8-11	9-1	9-4½	9-9	10-4	12-2	12-9
B —Boiler width in.	31	31	37	37	37	43	43	43	49	49	55	55	61	67	67	73	79	85	85
C —Boiler length ft.-in.	5-5⅜	6-5⅜	5-5⅜	6-1⅜	7-0⅜	6-11⅜	7-8⅜	8-5⅜	7-0⅜	8-0⅜	8-3⅜	9-5⅜	9-0⅜	9-11⅜	11-3⅞	11-7⅜	13-1⅞	12-0⅜	13-8⅜
D —Boiler lgth. overall ft.-in.	6-6⅜	7-6⅜	6-5⅜	7-1⅜	8-0⅜	7-11⅜	8-8⅜	9-5⅜	8-2⅜	9-2⅜	9-5⅜	10-7⅜	10-3⅜	11-3⅜	12-7⅞	13-3⅜	14-9⅞	13-8⅜	15-4⅜
E —Firebox lgth. ft.-in.	5-0⅛	6-0⅛	4-9⅞	5-5⅞	6-4⅞	6-3⅞	7-0⅞	7-9⅞	6-4⅞	7-4⅞	7-7⅞	8-9⅞	8-4⅞	9-3¾	10-8¼	10-11⅝	12-5⅛	11-3½	12-11½
F —Firebox height in.	27	27	27½	29	29½	30½	31½	31½	35½	37	39½	42	47	49½	53	56½	63½	71½	78½
S.H.B.I. av. furnace height in.	27.1	26.7	30.2	31.0	31.5	31.1	31.6	32.6	36.4	37.2	38.9	40.8	45.8	47.5	50.4	53.2	59.1	67.5	73.9
G —Firebox width in.	26	26	30	30	30	36	36	36	42	42	48	48	54	60	60	66	72	78	78
N —Smoke outlet, hgt. to c.l. ft.-in.	4-5½	4-5½	5-5½	5-7	5-7½	5-9½	5-10½	5-10½	6-9½	6-11	7-4½	7-7	8-4	8-8	8-11½	9-2½	9-10½	11-6½	12-1½
O—Boiler htg. overall ft.-in.	5-7½	5-7½	6-8½	6-10	6-10½	7-2½	7-3½	7-3½	8-6½	8-8	9-0½	9-3	10-4	10-7	10-10½	11-3½	12-0½	13-11½	14-6½
Firedoor openings, number in boiler	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
W—Firedoor openings, Dist. between in.									6	6	10	10	16	20	20	24	30	34	34
X —Height of fire door opening in.	12	12	10	10	10	10	10	10	12	12	12	12	12	12	12	12	12	12	12
Y —Width of fire door opening in.	16	16	12	12	12	12	12	12	16	16	16	16	16	16	16	16	16	16	16
YY—Projection of fire door opening in.	20¾	20¾	16½	16½	16½	16½	16½	16½	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾

TYPE OB—OIL FIRED

Boiler No.	*OB-317	*OB-318	OB-374	OB-375	OB-376	OB-434	OB-435	OB-436	OB-494	OB-495	OB-553	OB-554	OB-613	OB-673	OB-674	OB-733	OB-793	OB-854	OB-855
S.H.B.I. Rating—																			
Steam sq. ft.	2190	2680	3160	3650	4250	4860	5470	6080	7290	8500	10330	12150	15180	18220	21250	24290	30360	36430	42500
Water sq. ft.	3500	4280	5050	5840	6800	7770	8750	9720	11660	13600	16520	19440	24280	29150	34000	38860	48570	58280	68000
Heating surface sq. ft.	129	158	186	215	250	286	322	358	429	500	608	715	893	1072	1250	1429	1786	2143	2500
Furnace volume cu. ft.	15.7	19.2	22.6	26.1	30.4	34.8	39.1	43.5	52.1	60.8	73.8	86.8	108.5	130.2	151.8	173.5	216.9	260.3	303.6
A—Wat. line hgt. ft.-in.	4-10	4-10	5-8½	5-8½	5-8½	5-11	5-11	5-11	6-9	6-9	7-1	7-1	7-11	8-0	8-0	8-3½	8-5½	9-7½	9-7½
B—Boiler width in.	31	31	37	37	37	43	43	43	49	49	55	55	61	67	67	73	79	85	85
C—Boiler length ft.-in.	5-5⅜	6-5⅜	5-5⅜	6-1⅜	7-0⅜	6-11⅜	7-8⅜	8-5⅜	7-0⅜	8-0⅜	8-4⅜	9-8⅜	9-3⅜	10-2⅜	11-8¾	11-11⅜	13-7⅜	12-6⅜	14-4⅜
D—Boiler lgth. overall ft.-in.	6-6⅜	7-6⅜	6-5⅜	7-1⅜	8-0⅜	7-11⅜	8-8⅜	9-5⅜	8-2⅜	9-2⅜	9-6⅜	10-10⅜	10-6⅜	11-6⅜	13-0⅜	13-7⅜	15-3⅜	14-2⅜	16-0⅜
E—Firebox length ft.-in.	5-0⅛	6-0⅛	4-9⅞	5-5⅞	6-4⅞	6-3⅞	7-0⅞	7-9⅞	6-4⅞	7-4⅞	7-8⅞	9-0⅞	8-7⅞	9-6¾	11-0¾	11-3⅝	12-10⅝	11-9½	13-7½
F—Firebox height in.	27	27	26	26	26	28	28	28	31	31	33	33	35	36½	36½	39	41	41	41
G—Firebox width in.	26	26	30	30	30	36	36	36	42	42	48	48	54	60	60	66	72	78	78
xY—Firedoor open. in.	12x16	12x16	12x18	12x18	12x18	12x18	12x18	12x18	15x23	15x23	15x23	15x23	14x38	14x38	14x38	14x38	2-15x23	2-15x23	2-15x23

GENERAL DATA—TYPES MB AND OB BOILERS

Boiler No.	*OB-317	*OB-318	OB-374	OB-375	OB-376	OB-434	OB-435	OB-436	OB-494	OB-495	OB-553	OB-554	OB-613	OB-673	OB-674	OB-733	OB-793	OB-854	OB-855
Steam outlet, size in.	6	6	6	6	6	6	6	6	8	8	8	8	8	8	8	8	10	10	10
J —Steam outlet, location in.	24	24	24	24	26	24	24	26	30	36	30	34	24	24	26	42	46	36	46
Return inlet, size in.	3	3	3	3	3	3	3	3	4	4	4	4	4	4	4	4	6	6	6
K —Return inlet, location in.	15	15	15	15	15	15	15	15	16	16	19	19	19	19	19	19	20	20	20
Return inlet, add'l for WB. in.	4	4	4	4	4	5	5	5	5	5	6	6	6	6	6	6	8	8	8
Safety valve, size in.	1½	1½	2	2	2	2	2	2½	2½	2½	3	3	2-2	2-2½	2-2½	2-2½	2-2½	2-3	2-3
L—Safety valve, location in.	15	15	18	18	18	18	18	18	18	18	20	20	20	20	20	18	18	18	18
M—Base height in.	12	12	12	12	12	12	12	12	12	12	15	15	15	15	15	15	15	15	15
P—Smoke outlet, diameter in.	Oval 8x20½	Oval 8x20½	22	22	22	24	24	24	26	26	28	28	32	34	34	36	40	42	42
Q—Front chamber, depth in.	6	6	9	9	9	10	10	10	11	11	11	11	12	12	12	13	14	14	14
R—Smoke box, depth in.	13	13	12	12	12	12	12	12	14	14	14	14	15	16	16	20	20	20	20
V —Boiler width overall in.	32½	32½	39¼	39¼	39¼	45¼	45¼	45¼	51¼	51¼	57⅜	57⅜	63⅜	69½	69½	75½	81⅝	87¾	87¾
Z —Firedoor openings, hgt. from f. l. in.	22	22	19	19	19	20	20	20	21	21	24	24	24	25	25	25	25½	25½	25½
Breeching, diam. 1 boiler in.	16	16	22	22	22	24	24	24	26	26	28	28	32	34	34	36	40	42	42
Stack, diam 1 boiler in.	16	16	20	20	20	22	22	22	24	26	26	28	30	32	32	34	38	40	40
Stack, height 1 boiler in.	45	45	50	50	55	55	55	60	60	65	65	65	70	70	80	90	90	100	110
Breeching, diam. 2 boilers in.	22	22	30	30	30	34	34	34	38	40	40	44	46	50	50	52	56	56	58
Stack, diam. 2 boilers in.	22	22	28	28	28	31	31	31	34	36	36	40	42	46	46	48	54	54	56
Stack, height 2 boilers ft.	50	50	60	60	65	65	65	70	70	75	75	75	80	80	90	100	100	110	110
Covering surface sq. ft.	68	78	79	89	102	109	121	133	129	146	165	191	212	242	281	298	364	403	472
Shipping wgt., approx. lbs.	2550	2950	3900	4200	4700	5300	6000	6500	7100	8100	9500	10600	12300	14700	16900	19600	22800	28500	32600

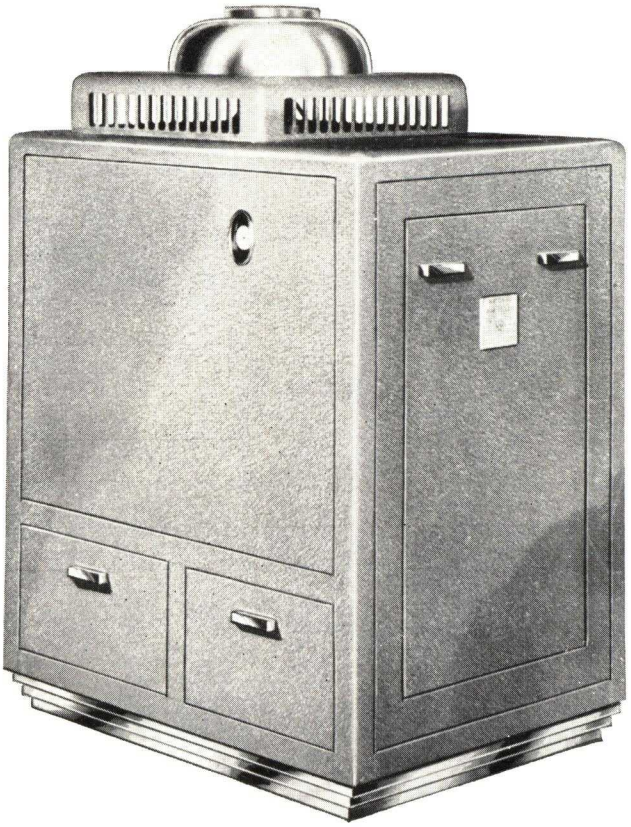
NATIONAL GAS BOILERS

THE PRODUCT

The National Gas Boiler is designed to meet the well-defined demands imposed by the growing vogue of the basement room. Gas fuel, of course, by eliminating the need for a fuel bin and banishing dirt and odors, is the first step toward a real basement room. The National Gas Boiler goes the rest of the way . . . for it is a truly attractive piece of furniture, need not be partitioned off, and thus permits the maximum spaciousness and airiness which is a prime essential.

THE COVER

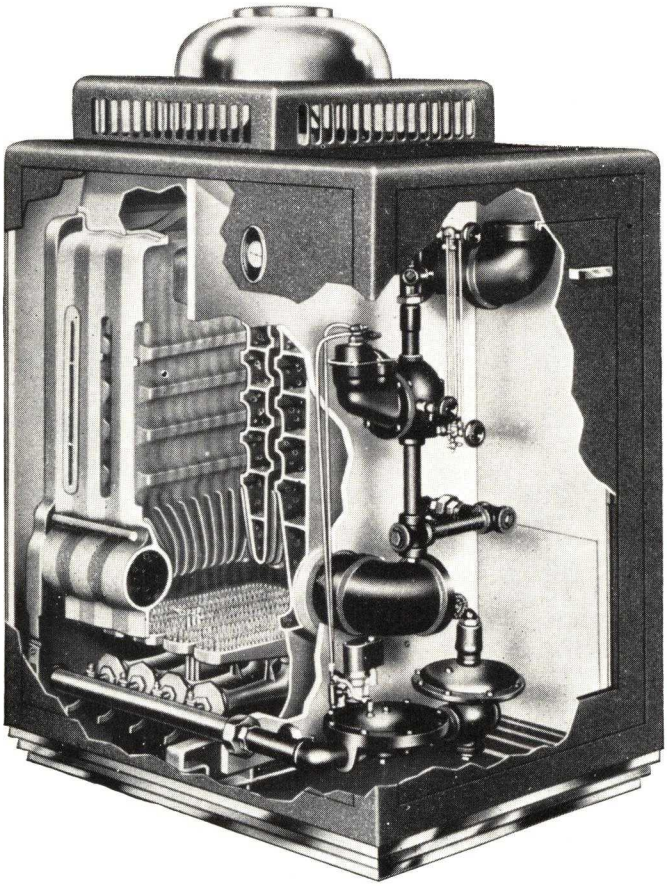
The chassis and controls are completely insulated and enclosed by a cover of exceptional beauty. An industrial designer of nation-wide renown, worked in close collaboration with the National Engineers and designed the exterior with particular emphasis upon utility and durability, as well as upon appearance. The body is finished in French gray baked enamel, and harmonizes well with any surroundings and any color scheme. Fabricated by a manufacturer of fine metal furniture, it rests upon a base, built up of castings and angles, which has a hard chromium finish that resists the chemical action of floor cleaning materials, is not marred by shoe or brush, is quickly brightened by a damp cloth. The dome is likewise of heavy chromium plate, inside and out, its curve in symmetry with the lines of the body. The assembly is a harmonious whole . . . simple, modern, in excellent taste.



THE CHASSIS—BY NATIONAL RESEARCH LABORATORIES

The engineering and mechanical principles are simple.

Ease of erection and of installation were given a prominent place in the planning. The number of parts to assemble has been kept to a minimum. Piping connections are easily made.



Deep, internal tube sections expose maximum heating surface to the flame, provide large steam-liberating area and steam storage space. For hot water heating or storage work, this element is equally effective.

SUPERIOR FEATURES OF DESIGN AND CONSTRUCTION

(1) Cast iron flue top—sturdy; gas-tight joint.

(2) Cast iron sections — rugged. Tested to 150 lbs. A.S.M.E. standard.

(3) Internal baffles—assure rapid steaming and steady water line.

(4) Intermediate sections — identical — interchangeable. Tapered flue passages give maximum efficiency.

(5) Manifold and burner cocks—entirely enclosed.

(6) Burner door—tight fitting, insulated.

(7) Chromium plated dome — corrosion-proof — instantly cleaned—always bright.

(8) Draft stabilizer — automatically maintains proper draft.

(9) Gauge panel—framed with chromium border.

(10) Controls — approved construction — completely enclosed.

(11) Air cell insulation—heavy asbestos, shields top and sides from heat loss.

(12) Chromium door handles—bright, decorative.

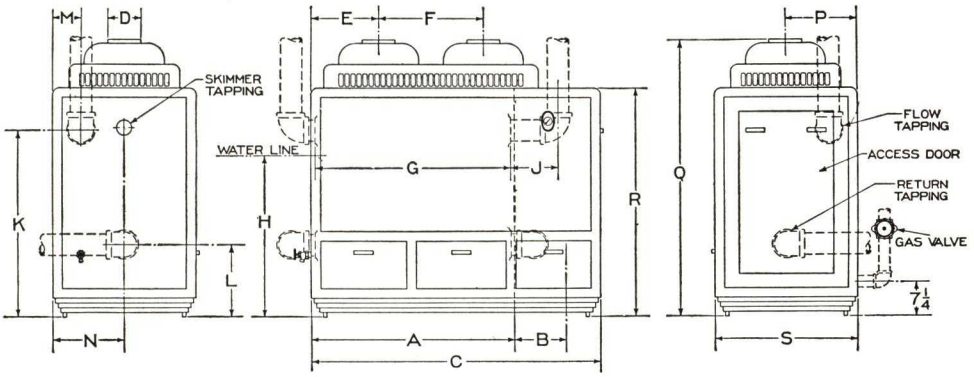
(13) Chromium base—corrosion-proof, scar-proof, dust-proof—unmarred by floor cleaning materials.

NATIONAL GAS BOILERS (Continued)

RATINGS AND DIMENSIONS

Boiler Series	Water line	Number and Size of tappings			Flow tapping to c. l. of flow piping	Floor to c. l. of flow tappings	Floor to c. l. of return tappings	Rear to c. l. of flow tappings	Rear to c. l. of return tappings	Rear to c. l. of flue outlet	Floor to top of flue outlet	Floor to top of boiler cover	Depth of Boiler cover
	H	*Flow	*Return	Skimmer	J	K	L	M	N	P	Q	R	S
3	31″	2–3″	2–3″	1–1¼″	12½″	34¼″	15″	5¼″	12½″	12½″	51¾″	41½″	25″
4	34″	2–4″	2–4″	1–2″	10″	39¼″	15¼″	6″	15″	15″	58⅜″	48⅛″	30″

*Five-section Series 3 and seven-section Series 4, and smaller, steam (Type "S") boilers have the left end Flow and Return Tappings plugged at factory—use right end tappings. Do not bush flow tappings.



Boiler No.	STEAM Certified A.G.A. rating, sq.ft.	Water Certified A.G.A. rating, sq.ft.	Overall width C	Number and size of flue openings	To left flue opening E	Width between flue openings	Width face to face of tappings G
SERIES 3 BOILERS							
3-3	300	480	32¾″	1–6″	12⅝″	...	13″
4-3	450	720	36¾″	1–6″	12⅝″	...	17″
5-3	600	960	40¾″	1–7″	15⅜″	...	21″
6-3	750	1200	44¾″	1–8″	15⅜″	...	25″
7-3	900	1440	48¾″	1–9″	15⅜″	...	29″
8-3	1050	1680	52¾″	1–9″	17⅜″	...	33″
9-3	1200	1920	56¾″	1–9″	19⅜″	...	37″
SERIES 4 BOILERS							
4-4	560	900	36¾″	1–7″	12⅝″	...	17″
5-4	750	1200	40¾″	1–7″	15⅜″	...	21″
6-4	940	1500	44¾″	1–8″	15⅜″	...	25″
7-4	1130	1800	48¾″	1–8″	15⅜″	...	29″
8-4	1310	2100	52¾″	1–9″	17⅜″	...	33″
9-4	1500	2400	56¾″	2–7″	14⅛″	18″	37″
10-4	1690	2700	60¾″	2–7″	14⅛″	22″	41″
11-4	1880	3000	64¾″	2–8″	14⅜″	18″	45″
12-4	2060	3300	68¾″	2–8″	14⅜″	22″	49″
13-4	2250	3600	72¾″	2–8″	14⅜″	26″	53″

Trimmings Furnished

Type "S" Boilers—

McDonnell & Miller combination pressure control and low water cut-off.

Robertshaw diaphragm cut-off valve.

Minneapolis solenoid (magnetic) valve with transformer.

Gas pressure regulator.

Pop safety valve (set at 10 lbs.).

Thermostatic pilot and escapement burners.

Labeled shut-off valve.

Compound retard vacuum and pressure gauge with siphon.

Water level gauge glass and fittings.

Metal jacketed cover.

Chromium plated metal base for cover.

Chromium plated draft dome.

Drain cocks.

Throttling control.

Type "W" Boilers—

Robertshaw reverse acting thermostat.

Robertshaw diaphragm cut-off valve.

Minneapolis solenoid (magnetic) valve with transformer.

Gas pressure regulator.

Thermostatic pilot and escapement burners.

Labeled shut-off valve.

Altitude gauge and thermometer.

Metal jacketed cover.

Chromium plated base for cover.

Chromium plated draft dome.

Drain cocks.

Throttling control (furnished on special order only).

SPECIFICATIONS FOR NATIONAL GAS BOILERS

Steam or Vapor—Furnish and install according to manufacturer's instructions where shown on plans..... No.....National Gas Boiler, with a Certified A.G.A. Steam Rating of.....sq. ft., as manufactured by the National Radiator Corporation, Johnstown, Pa. Boiler to be equipped with combination steam pressure control and low water cut-off, diaphragm cut-off valve, solenoid valve, gas pressure regulator, throttling control, pop safety valve, thermostatic pilot and escapement burners, labeled shut-off valve, compound retard pressure and vacuum gauge with siphon, water level gauge glass and fittings and drain cocks.

Hot Water—Furnish and install according to manufacturer's instructions where shown on plans..... No.....National Gas Boiler, with a Certified A.G.A. Water Rating of.....sq. ft., as manufactured by the National Radiator Corporation, Johnstown, Pa. Boiler to be equipped with Robertshaw reverse acting thermostat, diaphragm cut-off valve, solenoid valve, gas pressure regulator, thermostatic pilot and escapement burners, labeled shut-off valve, altitude gauge and thermometer and drain cocks.

General (for Steam, Vapor and Hot Water)—Furnish and install according to manufacturer's instructions the National Metal Jacketed Cover. Cover to be complete with chromium plated metal base for supporting the metal cover, chromium plated draft dome, control cabinet for housing all controls, burner and control access doors and heavy asbestos air cell insulation attached to the metal cover parts.

Furnish and install proper sized water connections with valve close to boiler.

Furnish and install.....in. gas line from meter to the labeled shut-off valve, which shall be located in the gas line close to the boiler.

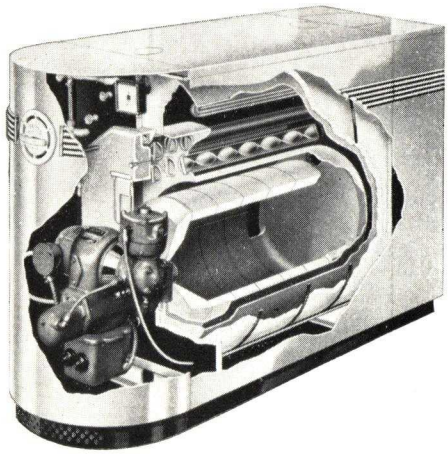
Connect vent opening to outside of building using ¼-in. galvanized pipe with union placed at the regulator end. The vent line to terminate outside of the building structure at least 3 ft. above the ground and to have an elbow faced down on the end of the line.

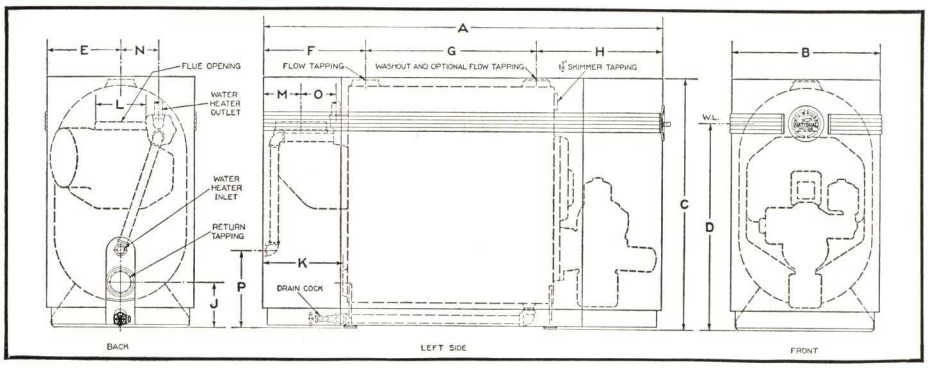
Furnish and install flue pipe from draft dome (or domes) on boiler to the chimney. Flue pipe to be made from..... gauge (specify desired corrosion resisting metal) metal and to be of.....in. in diameter (size shown in following table). Flue pipe to pitch upward from the boiler.

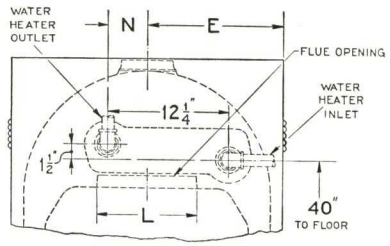
That this boiler has been manufactured and tested in accordance with the code of the American Society of Mechanical Engineers, that it is guaranteed against manufacturing defects for a period of one year from date of purchase, and that it will deliver its rated capacity, shall be set forth in a Surety Bond of a bonding company approved by the Architect.

NATIONAL STEEL OIL HEATING UNITS

The National Steel Oil Heating Unit is comprised of a Scotch Marine, fire-tube type welded boiler and a low pressure atomizing type burner. The boilers are equipped with refractory combustion chamber, turbulators, a National Observation Port and complete equipment for automatic firing. Each boiler is fitted with a Taco Biltin domestic hot water heater. The Nos. 2 and 3 units are shipped completely assembled on skids. The Nos. 4 and 5 units are shipped completely assembled with the exception of the burner and front cabinet of the jacket.







Above diagram shows water heater used on Nos. 4 and 5 units. Water heater used on Nos. 2 and 3 units shown in drawing at left.

DIMENSIONS

Type of Boiler	Boiler No.	Length of boiler	Width of boiler	Height of boiler	Height of water line	Side to c.l. of flow tapping	Rear to c.l. of flow tapping	Distance between flow tappings	Front to c.l. of optional flow tapping	Floor to c.l. of return tapping	Rear to face of return tapping	Diam. of flue opening	Rear to c.l. of flue opening	Water heater outlet to c.l. of boiler	Water heater outlet to c.l. flue opening	Floor to c.l. water heater inlet	Size of storage water heater connections	Size of flow and return tappings	Pop safety valve size
		A	B	C	D	E	F	G	H	J	K	L	M	N	O	P			
Steam	S-2	53⅛"	23"	38⅞"	32"	11½"	15⅞"	17¾"	19½"	7"	12⅜"	8"	5⅝"	5⅞"	5⅜"	12½"	1"	3"	¾"
	S-3	61⅞"	23"	38⅞"	32"	11½"	15⅞"	26½"	19½"	7"	12⅜"	8"	5⅝"	5⅞"	5⅜"	12½"	1"	3"	1"
	S-4	63⅞"	27½"	50¼"	42"	13¾"	18⅝"	22"	23¼"	7⅝"	14⅜"	10"	6¾"	4"	6"	40"	1"	4"	1¼"
	S-5	74⅛"	27½"	50¼"	42"	13¾"	18⅝"	32¼"	23¼"	7⅝"	14⅜"	10"	6¾"	4"	6"	40"	1"	4"	1½"
Water	W-2	53⅛"	23"	38⅞"	...	11½"	15⅞"	17¾"	19½"	7"	12⅜"	8"	5⅝"	5⅞"	5⅜"	12½"	1"	3"	...
	W-3	61⅞"	23"	38⅞"	...	11½"	15⅞"	26½"	19½"	7"	12⅜"	8"	5⅝"	5⅞"	5⅜"	12½"	1"	3"	...
	W-4	63⅞"	27½"	50¼"	...	13¾"	18⅝"	22"	23¼"	7⅝"	14⅜"	10"	6¾"	4"	6"	40"	1"	4"	...
	W-5	74⅛"	27½"	50¼"	...	13¾"	18⅝"	32¼"	23¼"	7⅝"	14⅜"	10"	6¾"	4"	6"	40"	1"	4"	...

RATINGS AND FUEL CAPACITIES

Boiler	Net load rating, sq. ft.	Available output		Recommended input		Heating surface, sq. ft.	Recommended chimney size	
		Sq. ft.	B. t. u.	Lbs. oil per hr.	Gal oil per hr.		Size, in.	Height, ft.
S-2	320	430	103,700	7.2	1.0	18.8	8 x 8	25
S-3	450	610	145,800	10.1	1.4	26.5	8 x 8	30
S-4	650	880	210,600	14.6	2.0	38.3	8 x 12	35
S-5	900	1215	291,600	20.3	2.7	53.0	8 x 12	40
W-2	510	690	103,700	7.2	1.0	18.8	8 x 8	25
W-3	720	970	145,800	10.1	1.4	26.5	8 x 8	30
W-4	1040	1400	210,600	14.6	2.0	38.3	8 x 12	35
W-5	1440	1950	291,600	20.3	2.7	53.0	8 x 12	40

HOT WATER HEATER CAPACITIES

Boiler No.	Rated capacities gallons per 3 hours	Recommended storage tank size, capacity—gallons	Size pipe to storage tank
2	50	Up to 50	1"
3	50	Up to 50	1"
* 4	75	Up to 82	1"
* 5	75	Up to 82	1"

*Larger size storage type heater with capacity of 110 gallons per three hours, and a tankless type heater with capacity of 180 gallons per hour are also available. All capacities based on boiler water at 180° F.

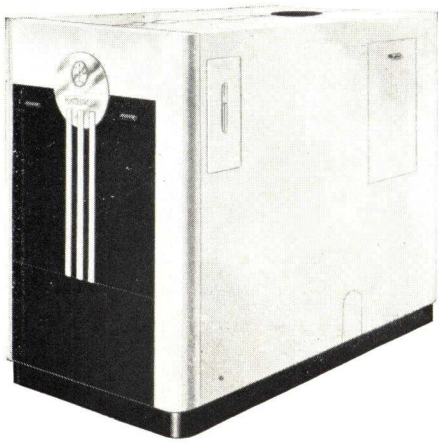
STANDARD EQUIPMENT

Steam and Water Boilers—Burner, boiler, cast iron platework, relief by-pass, refractory combustion chamber, turbulators, enameled sheet metal jacket, air cell insulation, National observation port, ¾-in. nickel plated drain cock, draft regulator, stack safety control, water temperature control, Biltin Taco submerged hot water heater and room thermostat.

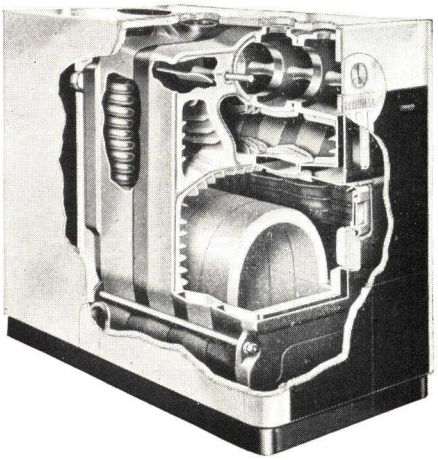
Steam Boilers Only — Water gauge fittings, pop safety valve, steam pressure gauge, steam pressure control and built-in McDonnell & Miller low water cut-off.

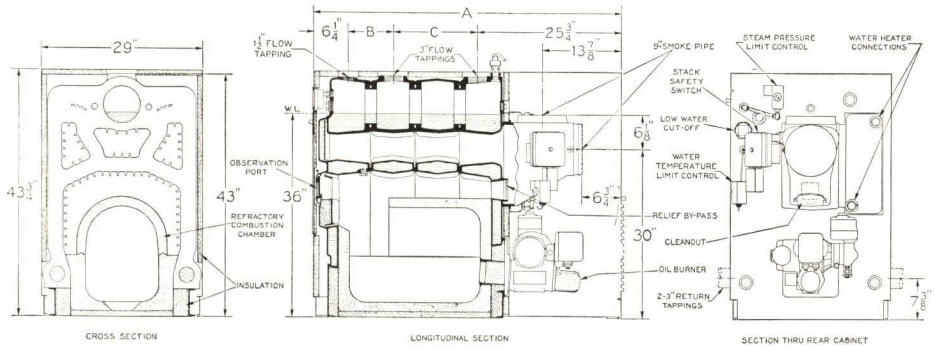
Water Boilers Only—Altitude-pressure gauge and thermometer.

NATIONAL CAST IRON OIL HEATING UNITS



National Cast Iron Oil Heating Units are regularly equipped with a high pressure atomizing oil burner but a low pressure type burner is available at extra cost. Boilers are fitted with a refractory combustion chamber. Taco Biltin storage type hot water heater and all controls required for automatic heating. (See complete list of equipment at bottom of page.) Extended heating surface in the form of fingers is provided along the waterlegs and flue galleries. Large nipple ports provide unrestricted circulation, while special baffles in the sections and a large steam releasing area provide dry steam. Water line is only 36 in. high.





RECOMMENDED FIRING RATES

Boiler No. 6—gallons per hr., 1.4
Boiler No. 8—gallons per hr., 1.9
Boiler No. 10—gallons per hr., 2.4

It is recommended that boilers be operated with input rates shown in the table. Boilers so operated should give the most satisfactory results.

Boiler No.		Dimensions			Number and size of flow tappings	Number and size of return tappings	*Domestic Hot Water Heater		
Steam	Water	A	B	C			Rated capacities gallons per 3 hours 40° to 140 F	Recommended storage tank size capacity, gallons	Pipe size to storage tank
S- 6	W- 6	47¼"	21½"		1-1½" and 1-3"	2-3"	44	Up to 66	1"
S- 8	W- 8	55 5/16"	14 5/16"	15¼"	1-1½" and 2-3"	2-3"	44	Up to 66	1"
S-10	W-10	63⅜"	14⅜"	23¼"	1-1½" and 2-3"	2-3"	44	Up to 66	1"

*A larger storage type heater with capacity of 100 gallons per three hours and two sizes of tankless heaters (180 and 210 gallons per hour) are also available. All capacities based on boiler water at 180° F.

RATINGS AND FUEL CAPACITIES

Boiler No.		Heating surface, sq. ft.	Bonded Load Rating		Minimum Recommended Oil Input, per hour			Chimney size	
Steam	Water		Steam, sq. ft.	Water, sq. ft.	B.t.u.	Pounds	Gallons	Size, in.	Height, in.
S- 6	W- 6	32.1	410	655	192,500	10.0	1.36	8x 8	30
S- 8	W- 8	43.8	565	905	263,000	13.7	1.87	8x12	35
S-10	W-10	55.6	720	1150	333,700	17.4	2.36	8x12	35

(1) Bonded Load Ratings represent actual installed cast iron radiation plus domestic hot water load. To express the water heater load in terms of square feet of radiation, figure each gallon of storage tank capacity as equivalent to 1 sq. ft. of steam radiation or 1.6 sq. ft. of hot water radiation. When built-in tankless heater is installed, add 50 sq. ft. steam radiation or 80 sq. ft. water radiation per bathroom to installed radiation before selecting boiler size.

Ample allowance for piping and pick-up is made in the Bonded Load Ratings for the average installation. If the piping load is excessive, additional allowance should be made.

(2) Minimum Burner Capacity is based on oil of 19,200 B.t.u. per lb. and 7.35 lbs. per gallon.

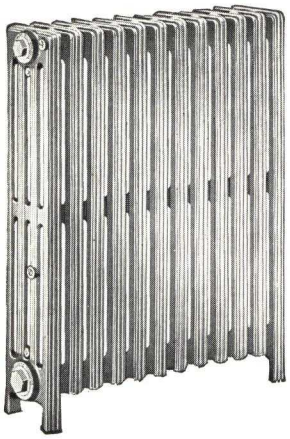
STANDARD EQUIPMENT

Steam and Water Boilers—Boiler, burner, cast iron platework, relief by-pass, refractory combustion chamber, enameled sheet metal jacket, heavy air-cell insulation, special moulded insulation for combustion chamber, National observation port, ¾-in. nickel plated drain cock, Taco Biltin submerged water heater, draft regulator, stack safety control, water temperature control and room thermostat.

Steam Boilers Only—Water gauge fittings, pop safety valve, steam pressure gauge, built-in McDonnell & Miller low water cut-off and and steam pressure control.

Water Boilers Only—Altitude-pressure gauge and thermometer.

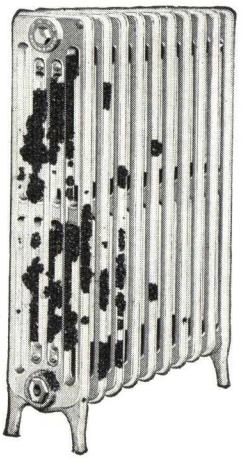
NATIONAL ART AND AERO RADIATORS



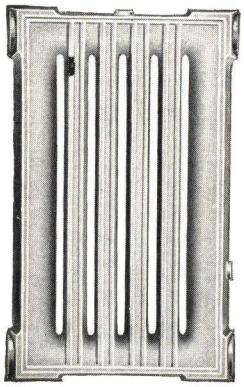
Art Radiator

NATIONAL RADIATOR CORPORATION has played a leading part in the development of radiator heating. The Aero was the first tube type radiator placed on the market to replace the old style column radiation. National was the leader in successfully utilizing push nipple construction; was the first manufacturer to introduce an all-cast-iron convector and, more recently, was the first to produce a truly artistic small tube radiator—the National Art.

Art radiators are especially adaptable for modernization work as they can be used either exposed or recessed, and will replace the older and larger styles with only minor piping changes. Due to its low steam or water content, the Art radiator heats very quickly, making it well adapted for the "on" and "off" demands of automatically fired systems.



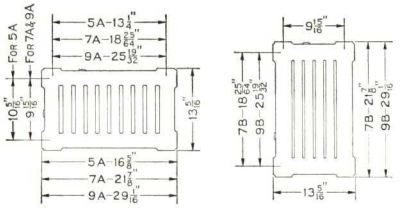
Aero Tube



Aero Wall

AERO WALL RADIATORS

Number of sections	Length of space occupied				Heating surface, sq. ft.	
	Type 5-A ft. in.	Type 7-A ft. in.	Type 9-A ft. in.	Types 7-B, 9-B ft. in.	Type 7	Type 9
1	1- 4 5/8	1- 9 7/8	2- 5 1/16	1- 1 5/16	7	9
2	2- 9 1/4	3- 7 3/4	4-10 1/8	2- 2 5/8	14	18
3	4- 1 7/8	5- 5 5/8	7- 3 3/16	3- 3 15/16	21	27
4	5- 6 1/2	7- 3 1/2	9- 8 1/4	4- 5 1/4	28	36
5	6-11 1/8	9- 1 3/8	12- 1 3/8	5- 6 9/16	35	45
6	8- 3 3/4	10-11 1/4	14- 6 3/8	6- 7 7/8	42	54
7	9- 8 3/8	12- 9 1/8	16-11 7/16	7- 9 3/16	49	63
8	11- 1	14- 7	19- 4 1/2	8-10 1/2	56	72
9	12- 5 5/8	16- 4 7/8	21- 9 9/16	9-11 13/16	63	81
10	13-10 1/4	18- 2 3/4	24- 2 5/8	11- 1 1/8	70	90
11	15- 2 7/8	20- 0 5/8	26- 7 11/16	12- 2 7/16	77	99
12	16- 7 1/2	21-10 1/2	29- 0 3/4	13- 3 3/4	84	108



ART RADIATORS — SIZES AND RATINGS

Number of sections	Length 1½ in. per section	THREE-TUBE			FOUR-TUBE			FIVE-TUBE		
		19 in. Height 1.1 sq. ft. per section	22 in. Height 1.3 sq. ft. per section	25 in. Height 1.5 sq. ft. per section	19 in. Height 1.4 sq. ft. per section	22 in. Height 1.6 sq. ft. per section	25 in. Height 1.8 sq. ft. per section	20 in. Height 1.8 sq. ft. per section	23 in. Height 2.1 sq. ft. per section	26 in. Height 2.4 sq. ft. per section
2	3	2.2	2.6	3.0	2.8	3.2	3.6	3.6	4.2	4.8
4	6	4.4	5.2	6.0	5.6	6.4	7.2	7.2	8.4	9.6
6	9	6.6	7.8	9.0	8.4	9.6	10.8	10.8	12.6	14.4
8	12	8.8	10.4	12.0	11.2	12.8	14.4	14.4	16.8	19.2
10	15	11.0	13.0	15.0	14.0	16.0	18.0	18.0	21.0	24.0
12	18	13.2	15.6	18.0	16.8	19.2	21.6	21.6	25.2	28.8
14	21	15.4	18.2	21.0	19.6	22.4	25.2	25.2	29.4	33.6
16	24	17.6	20.8	24.0	22.4	25.6	28.8	28.8	33.6	38.4
18	27	19.8	23.4	27.0	25.2	28.8	32.4	32.4	37.8	43.2
20	30	22.0	26.0	30.0	28.0	32.0	36.0	36.0	42.0	48.0
22	33	24.2	28.6	33.0	30.8	35.2	39.6	39.6	46.2	52.8
24	36	26.4	31.2	36.0	33.6	38.4	43.2	43.2	50.4	57.6
26	39	28.6	33.8	39.0	36.4	41.6	46.8	46.8	54.6	62.4
28	42	30.8	36.4	42.0	39.2	44.8	50.4	50.4	58.8	67.2
30	45	33.0	39.0	45.0	42.0	48.0	54.0	54.0	63.0	72.0
32	48	35.2	41.6	48.0	44.8	51.2	57.6	57.6	67.2	76.8
34	51	37.4	44.2	51.0	47.6	54.4	61.2	61.2	71.4	81.6
36	54	39.6	46.8	54.0	50.4	57.6	64.8	64.8	75.6	86.4
38	57	41.8	49.4	57.0	53.2	60.8	68.4	68.4	79.8	91.2
40	60	44.0	52.0	60.0	56.0	64.0	72.0	72.0	84.0	96.0
42	63	46.2	54.6	63.0	58.8	67.2	75.6	75.6	88.2	100.8
44	66	48.4	57.2	66.0	61.6	70.4	79.2	79.2	92.4	105.6
46	69	50.6	59.8	69.0	64.4	73.6	82.8	82.8	96.6	110.4
48	72	52.8	62.4	72.0	67.2	76.8	86.4	86.4	100.8	115.2
50	75	55.0	65.0	75.0	70.0	80.0	90.0	90.0	105.0	120.0
Sq. ft. per lineal inch		0.733	0.867	1.000	0.933	1.067	1.200	1.200	1.400	1.600
Distance from floor to center of top tapping		17 7/8	20 7/8	23 7/8	17 7/8	20 7/8	23 7/8	18 7/8	21 7/8	24 7/8
Distance from floor to center bottom tapping		2½	2½	2½	2½	2½	2½	3½	3½	3½

Depth of sections: three-tube, 3⅜ in.; four-tube, 4 9/16 in.; five-tube, 5¾ in.

Depth at feet is the same as depth of section.

Add ½ in. to length for each bushing.

Tapped 1¼ in. at bottom both ends; 1 in. top both ends.

Can be furnished legless or with legs 4½ in. from floor to center of bottom tapping when ordered.

To determine over-all height of three-tube or four-tube legless radiators, deduct 1⅜ in. from the standard heights. For five-tube deduct 2⅜ in.

NATIONAL AERO RADIATORS

SIZES AND RATINGS

Number of sections	*Length 2½ in. per sec.	Three-Tube					Four-Tube					Five-Tube				
		36-in. Height 3½ sq. ft. per sec.	30-in. Height 3 sq. ft. per sec.	26-in. Height 2⅓ sq. ft. per sec.	23-in. Height 2 sq. ft. per sec.	20-in. Height 1¾ sq. ft. per sec.	36-in. Height 4¼ sq. ft. per sec.	30-in. Height 3½ sq. ft. per sec.	26-in. Height 2¾ sq. ft. per sec.	23-in. Height 2½ sq. ft. per sec.	20-in. Height 2¼ sq. ft. per sec.	36-in. Height 5 sq. ft. per sec.	30-in. Height 4⅓ sq. ft. per sec.	26-in. Height 3½ sq. ft. per sec.	23-in. Height 3 sq. ft. per sec.	20-in. Height 2⅔ sq. ft. per sec.
2	5	7	6	4⅔	4	3½	8½	7	5½	5	4½	10	8⅔	7	6	5⅓
3	7½	10½	9	7	6	5¼	12¾	10½	8¼	7½	6¾	15	13	10½	9	8
4	10	14	12	9⅓	8	7	17	14	11	10	9	20	17⅓	14	12	10⅔
5	12½	17½	15	11⅔	10	8¾	21¼	17½	13¾	12½	11¼	25	21⅔	17½	15	13⅓
6	15	21	18	14	12	10½	25½	21	16½	15	13½	30	26	21	18	16
7	17½	24½	21	16⅓	14	12¼	29¾	24½	19¼	17½	15¾	35	30⅓	24½	21	18⅔
8	20	28	24	18⅔	16	14	34	28	22	20	18	40	34⅔	28	24	21⅓
9	22½	31½	27	21	18	15¾	38¼	31½	24¾	22½	20¼	45	39	31½	27	24
10	25	35	30	23⅓	20	17½	42½	35	27½	25	22½	50	43⅓	35	30	26⅔
11	27½	38½	33	25⅔	22	19¼	46¾	38½	30¼	27½	24¾	55	47⅔	38½	33	29⅓
12	30	42	36	28	24	21	51	42	33	30	27	60	52	42	36	32
13	32½	45½	39	30⅓	26	22¾	55¼	45½	35¾	32½	29¼	65	56⅓	45½	39	34⅔
14	35	49	42	32⅔	28	24½	59½	49	38½	35	31½	70	60⅔	49	42	37⅓
15	37½	52½	45	35	30	26¼	63¾	52½	41¼	37½	33¾	75	65	52½	45	40
16	40	56	48	37⅓	32	28	68	56	44	40	36	80	69⅓	56	48	42⅔
17	42½	59½	51	39⅔	34	29¾	72¼	59½	46¾	42½	38¼	85	73⅔	59½	51	45⅓
18	45	63	54	42	36	31½	76½	63	49½	45	40½	90	78	63	54	48
19	47½	66½	57	44⅓	38	33¼	80¾	66½	52¼	47½	42¾	95	82⅓	66½	57	50⅔
20	50	70	60	46⅔	40	35	85	70	55	50	45	100	86⅔	70	60	53⅓
21	52½	73½	63	49	42	36¾	89¼	73½	57¾	52½	47¼	105	91	73½	63	56
22	55	77	66	51⅓	44	38½	93½	77	60½	55	49½	110	95⅓	77	66	58⅔
23	57½	80½	69	53⅔	46	40¼	97¾	80½	63¼	57½	51¾	115	99⅔	80½	69	61⅓
24	60	84	72	56	48	42	102	84	66	60	54	120	104	84	72	64
25	62½	87½	75	58⅓	50	43¾	106¼	87½	68¾	62½	56¼	125	108⅓	87½	75	66⅔
Distance from floor to center of top tapping		33 13/16	27⅞	23 13/16	20 13/16	17⅞	33 13/16	27⅞	23 13/16	20 13/16	17⅞	33 13/16	27⅞	23 13/16	20 13/16	17⅞
Distance from floor to center bottom tapping		4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½

Number of sections	*Length 2½-in. per sec.	Six-Tube					Seven-Tube					
		38-in. Height 6 sq. ft. per sec.	32-in. Height 5 sq. ft. per sec.	26-in. Height 4 sq. ft. per sec.	23-in. Height 3½ sq. ft. per sec.	20-in. Height 3 sq. ft. per sec.	36-in. Height 6¾ sq. ft. per sec.	30-in. Height 5½ sq. ft. per sec.	26-in. Height 4¾ sq. ft per sec.	20-in. Height 3⅔ sq. ft. per sec.	16½-in. Height 3 sq. ft. per sec.	13½-in. Height 2½ sq. ft. per sec.
2	5	12	10	8	7	6	13½	11	9½	7⅓	6	5
3	7½	18	15	12	10½	9	20¼	16½	14¼	11	9	7½
4	10	24	20	16	14	12	27	22	19	14⅔	12	10
5	12½	30	25	20	17½	15	33¾	27½	23¾	18⅓	15	12½
6	15	36	30	24	21	18	40½	33	28½	22	18	15
7	17½	42	35	28	24½	21	47¼	38½	33¼	25⅔	21	17½
8	20	48	40	32	28	24	54	44	38	29⅓	24	20
9	22½	54	45	36	31½	27	60¾	49½	42¾	33	27	22½
10	25	60	50	40	35	30	67½	55	47½	36⅔	30	25
11	27½	66	55	44	38½	33	74¼	60½	52¼	40⅓	33	27½
12	30	72	60	48	42	36	81	66	57	44	36	30
13	32½	78	65	52	45½	39	87¾	71½	61¾	47⅔	39	32½
14	35	84	70	56	49	42	94½	77	66½	51⅓	42	35
15	37½	90	75	60	52½	45	101¼	82½	71¼	55	45	37½
16	40	96	80	64	56	48	108	88	76	58⅔	48	40
17	42½	102	85	68	59½	51	114¾	93½	80¾	62⅓	51	42½
18	45	108	90	72	63	54	121½	99	85½	66	54	45
19	47½	114	95	76	66½	57	128¼	104½	90¼	69⅔	57	47½
20	50	120	100	80	70	60	135	110	95	73⅓	60	50
21	52½	126	105	84	73½	63	141¾	115½	99¾	77	63	52½
22	55	132	110	88	77	66	148½	121	104½	80⅔	66	55
23	57½	138	115	92	80½	69	155¼	126½	109¼	84⅓	69	57½
24	60	144	120	96	84	72	162	132	114	88	72	60
25	62½	150	125	100	87½	75	168¾	137½	118¾	91⅔	75	62½
Distance from floor to center of top tapping.		35⅞	29 15/16	23 15/16	20 11/16	17⅞	33 13/16	27⅞	23 13/16	17⅞	14⅜	11⅜
Distance from floor to center bottom tapping.		4½	4½	4½	4½	4½	4½	4½	4½	4½	3	3

	Width of Feet	Width of Section
3-Tube	5⅛″	5⅛″
4-Tube	6 13/16″	6 13/16″
5-Tube	8 7/16″	8 7/16″
6-Tube	9″	9″
7-Tube	12″	12″

Tapped 1½ in. top one end and bottom both ends and bushed to sizes required.

Can be furnished legless, or with legs 6 in. from floor to center of tapping boss when ordered; also 4½-in. legs for the 7-tube on the 13½-in. and 16½-in. heights.

To determine height of legless radiators deduct 2⅛ in. from standard height of the 3-, 4-, 5- and 7-tube radiators, except the 13½ and 16½-in., in which case ¾-in. should be deducted; deduct 2½ in. from the standard height of the 6-tube radiators.

All radiators are assembled with high test cast iron push nipples top and bottom.

*Add ½ in. to length for each bushing.

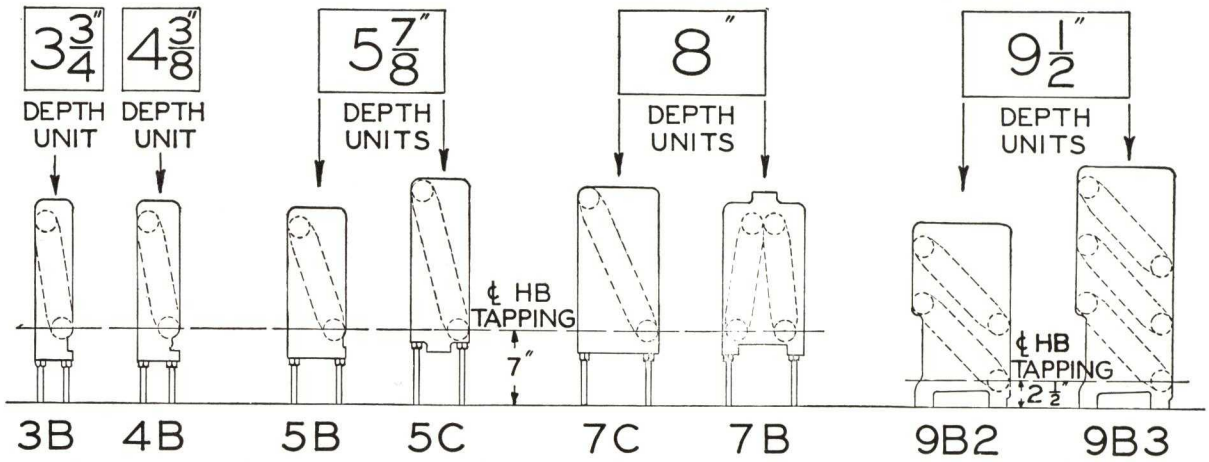
THE AERO CONVECTOR

The Aero Convector is a durable cast iron sectional fin-cast-integral concealed heating unit especially designed to obtain comfort by delivering into a room a large volume of moderately warmed air. The ingenius method of sloping the intermediate sections permits the combining of wide fin spacing with short air travel which produces low ceiling temperatures, saves fuel and avoids stratification of air.

Aero Convectors are more conservatively rated than any others and are tested in accordance with the A.S.H.V.E. Code. They are admirably suited for all types of heating systems because they possess all the desirable characteristics of the direct radiator. The ability to retain heat makes them ideal for automatic regulation and split air conditioning systems. Being ruggedly constructed they can withstand abuse and be used for temporary heat while building is under construction.

RECESS DEPTHS—

These end views show the wide latitude in recess depths that can be met with Aero Convectors.



Leg heights are specified from floor to center line of "HB" tapping. Standard leg heights are 7 in. for all except 9B2 and 9B3, which are 2½ in. Specify 6-in. legs for 5C, 7C, 7B or 9B2 with lowest enclosure height.

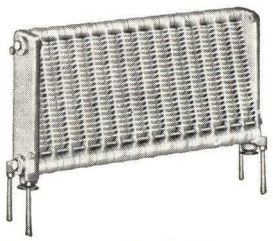
TYPES OF CONVECTORS AVAILABLE

Convector No. 3B30
for One-pipe Steam

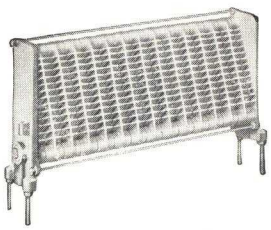
Units illustrated for One-pipe Steam Systems are also available with other end sections for water, vapor or vacuum systems. Units illustrated for Water, Vapor or Vacuum Systems are also available with other end sections for one-pipe steam systems. Only 5B and 7B units are available with vertical top tappings.

Extensive study of the problems involved in satisfactory operation of convectors on one-pipe steam jobs led to the development of special end sections shown in several illustrations herewith. Top tappings, which are not required, have been eliminated. One outstanding advantage of the new section lies in the fact that entering steam cannot spray water against the air valve, causing "spitting" and fouling.

For complete information request Catalog No. 273-A.

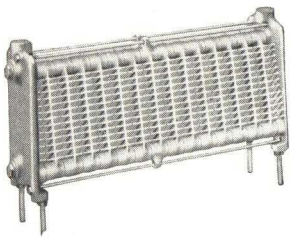


Convector No. 5C30
for Water, Vapor or Vacuum

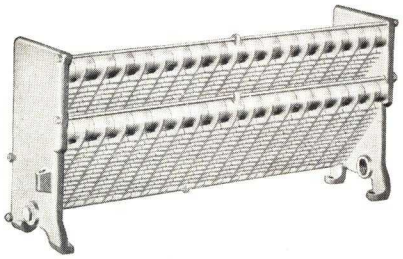


Convector No. 5B30
for One-pipe Steam

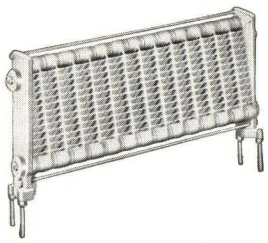
Convector No. 7C30
for One-pipe Steam



Convector No. 7B32
for Water, Vapor or Vacuum



Convector No. 9B238
for One-pipe Steam



Convector No. 4B30
for Water, Vapor or Vacuum

Convector No. 9B338
for Water, Vapor or Vacuum

THE AERO CONVECTOR (Continued)

AERO ENCLOSURES APPLIED TO CONSTRUCTION

Type "RE"—A complete enclosure which—as is shown in the illustrations above—can be used free standing, partially recessed, or completely recessed. It has a removable front. If recessed in the wall, plaster should finish against ends and top of enclosure. When recessed under wood stool, plaster should finish against ends of enclosure. Stool and apron should be extended over enclosure, and apron fitted between stool and enclosure top. Scribe moulding may be used at ends of enclosure.

Type "OE"—Shown at right, is a complete enclosure for full recessing in walls or under windows. The front overlaps tile or plaster ½ in. at top and ¾ in. at each end. It is attached to liner by screws or clips. If recess is not deep enough to accommodate enclosure, wall must be furred to suit, as enclosure front must fit against finished wall. Top and sides are beveled to insure air-tight joint with plaster.

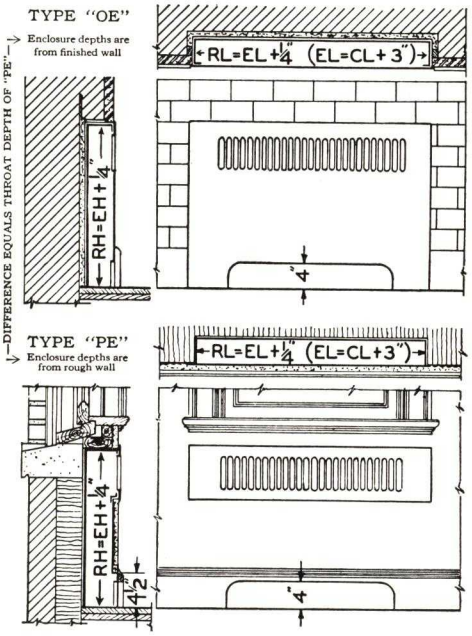
Type "PE"—Shown at right, is a complete enclosure for use in plaster or tile treatments, and must be fully recessed. The front is provided with holes or clips for securing wire lath. *The throat is arranged for a ¾-in. thickness of lath and plaster, or a 1½-in. thickness of tile, and is flanged to receive outlet grille. Order must specify when enclosures are for tile installation.* Bottom inlet is flanged to receive ground to which baseboard may be attached. Inlet opening in liner is 4½-in. high, and a 4-in. high arched inlet must be provided in baseboard by carpenter. Four sides of outlet grille are beveled to insure airtight joint with plaster.

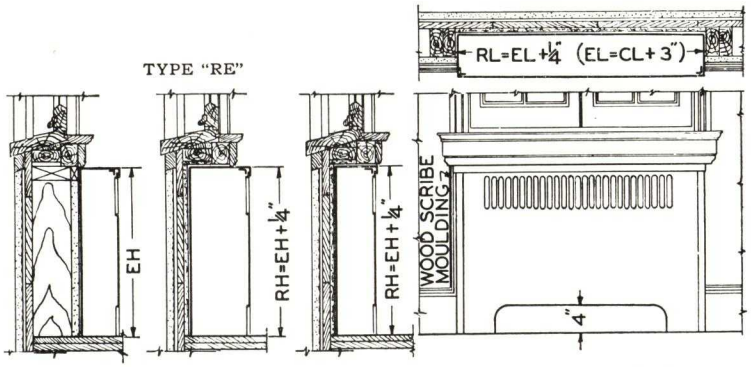
All enclosure dimensions are inside measurements. An allowance of ¼ in. in length, height and depth is advisable between recess and these enclosure dimensions.

KEY

CL— Convector Length
EL— Enclosure Leng.h
RL— Recess Length
FPL— Front Panel Length
EH— Enclosure Height
RH— Recess Height
FPH— Front Panel Height

Bar type outlet grilles and arched inlets are standard. Access to valve is through arched inlet.





AERO FRONT PANELS APPLIED

Type "EF" Front Panels—Shown top right provide additional depth. Side and top edges bear against, and extend from, face of plaster. Face of front is beyond baseboard and overlaps recess at top and sides. Front is provided with screw holes for attaching to wood grounds. Apron and stool can be projected if considered advisable. Scribe moulding may be used at ends of front.

1½-in. extensions are furnished on all orders unless instructions are otherwise. Extensions up to 5⅛-in. will be supplied at no additional charge.

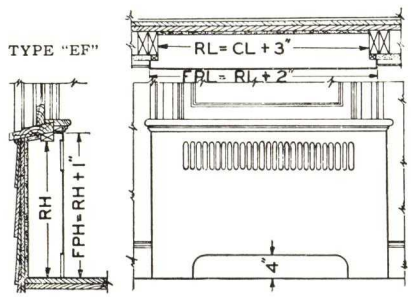
1½-in. extensions are usually used with 5B and 5C units; 3⅝-in. with 7C and 7B units; and 5⅛-in. with 9B2 and 9B3 units. Resulting total depths are 5⅞, 8 and 9½-in. when recess depths, including lath and plaster thickness, are 4⅜-in.

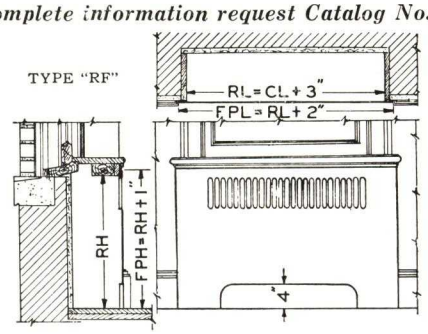
Tyye "RF" Front Panels—Shown at right, do not provide additional depth. They fit flush with plaster, and overlap top and sides of recess. Front is provided with screw holes for attaching to wood ground. Top and sides are beveled to insure airtight joint with plaster. Scribe moulding may be used at ends of front.

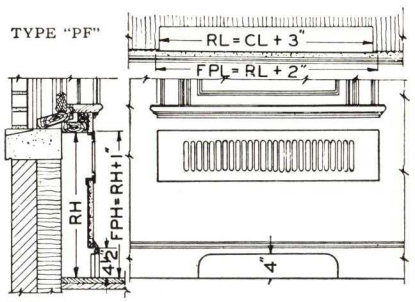
Type "PF" Front Panels — Bottom right, are substantially the same as front of a Type "RE" enclosure, except that they are 1-in. higher at top and 1-in. longer on each end than the main body of "PE" liner, to allow for attachment to recess. In setting the "PF" Front Panel 4½-in. above the finished floor and providing a 4-in. high inlet in the baseboard the same effect is obtained as with a complete "PE" enclosure. The top of the outlet grille overlaps the plaster ½-in. at the top, and—when setting instructions above are followed—is in the same position as it would be in a "PE" enclosure. The top of the "PF" grille is ½-in. below the top edge of the front panel. In ordering, height specified should be height of recess plus 1-in.—in which case front panel will be located 4½-in. above finished floor. Four sides of outlet grille are beveled to insure airtight joint with plaster.

Screw holes 3/16-in. diameter on "EF" and "RF" Front Panels are regularly located ½ in. from edge at top and sides. Countersunk holes furnished only when specified on order.

For complete information request Catalog No. 273-A.







RATINGS WHEN USED WITH FRONT OR TOP OUTLET ENCLOSURES

Steam or Water Rating — Sq. Ft. — E. D. R.

Nominal convector length	** Complete enclosure length	** Front panel length	20-in. ENCLOSURE HEIGHT							23-in. ENCLOSURE HEIGHT						26-in. ENCLOSURE HEIGHT						29-in. ENCLOSURE HEIGHT					
			3B	4B	5B	*5C	7C	7B	*9B2	3B	4B	5C	7C	7B	9B2	3B	4B	5C	7C	7B	9B2	3B	4B	5C	7C	7B	9B2
10″	13″	15″	6	6	7	8	9	10	12	7	7	9	10	12	13	7	7	9	11	13	14	7	8	10	11	13	14
12″	15″	17″	7	8	9	10	11	12	14	8	8	10	12	14	15	8	9	11	13	15	17	9	9	12	14	16	17
14″	17″	19″	9	9	10	11	13	14	16	9	10	12	14	16	18	10	10	13	15	18	19	10	11	14	16	19	20
16″	19″	21″	10	10	11	13	15	16	19	11	11	14	16	19	20	11	12	15	18	20	22	12	12	16	18	21	23
18″	21″	23″	11	11	13	14	17	18	21	12	13	15	19	21	23	13	13	17	20	23	25	13	14	18	21	24	26
20″	23″	25″	12	13	14	16	19	20	23	13	14	17	21	23	25	14	15	19	22	25	28	14	15	20	23	27	29
22″	25″	27″	14	14	16	18	21	22	25	15	15	19	23	26	28	15	16	20	24	28	31	16	17	22	25	30	32
24″	27″	29″	15	15	17	19	23	24	28	16	17	20	25	28	30	17	18	22	26	30	33	17	18	24	27	32	35
26″	29″	31″	16	16	19	21	24	26	30	17	18	22	27	30	33	18	19	24	28	33	36	19	20	26	30	35	37
28″	31″	33″	17	18	20	22	26	29	32	18	19	24	29	33	35	19	21	26	31	35	39	20	21	28	32	38	40
30″	33″	35″	18	19	21	24	28	31	35	20	21	26	31	35	38	21	22	28	33	38	42	22	23	30	34	40	43
32″	35″	37″	20	20	23	26	30	33	37	21	22	27	33	37	41	22	24	30	35	40	44	23	24	32	36	43	46
34″	37″	39″	21	21	24	27	32	35	39	22	24	29	35	39	43	24	25	32	37	43	47	25	26	33	39	46	49
36″	39″	41″	22	23	26	29	34	37	42	24	25	31	37	42	46	25	27	33	39	45	50	26	27	35	41	48	52
38″	41″	43″	23	24	27	30	36	39	44	25	26	32	39	44	48	26	28	35	42	48	53	27	29	37	43	51	55
40″	43″	45″	25	25	28	32	38	41	46	26	28	34	41	46	51	28	30	37	44	50	56	29	30	39	46	54	58
42″	45″	47″	26	26	30	34	39	43	49	28	29	36	43	49	53	29	31	39	46	53	58	30	32	41	48	56	61
44″	47″	49″	27	28	31	35	41	45	51	29	31	37	45	51	56	31	33	41	48	55	61	32	33	43	50	59	63
46″	49″	51″	28	29	33	37	43	47	53	30	32	39	47	53	58	32	34	43	50	58	64	33	35	45	52	62	66
48″	51″	53″	29	30	34	38	45	49	56	32	33	41	49	56	61	33	35	45	52	61	67	35	36	47	55	64	69
50″	53″	55″	31	31	36	40	47	51	58	33	35	43	51	58	63	35	37	46	55	63	69	36	38	49	57	67	72
52″	55″	57″	32	33	37	42	49	53	60	34	36	44	53	60	66	36	38	48	57	66	72	38	39	51	59	70	75
54″	57″	59″	33	34	38	43	51	55	63	36	38	46	55	63	68	37	40	50	59	68	75	39	41	53	62	72	78
56″	59″	61″	34	35	40	45	53	57	65	37	39	48	57	65	71	39	41	52	61	71	78	40	42	55	64	75	81
58″	61″	63″	36	36	41	46	54	59	67	38	40	49	59	67	73	40	43	54	63	73	80	42	44	57	66	78	84
60″	63″	65″	37	38	43	48	56	61	69	39	42	51	62	70	76	42	44	56	66	76	83	43	45	59	68	80	86
62″	65″	67″	38	39	44	50	58	63	72	41	43	53	64	72	79	43	46	58	68	78	86	45	47	61	71	83	89
64″	67″	69″	39	40	46	51	60	65	74	42	44	54	66	74	81	44	47	59	70	81	89	46	48	63	73	86	92
66″	69″	71″	41	41	47	53	62	67	76	43	46	56	68	77	84	46	49	61	72	83	92	48	50	65	75	88	95
68″	71″	73″	42	42	48	54	64	69	79	45	47	58	70	79	86	47	50	63	74	86	94	49	51	67	77	91	98
70″	73″	75″	43	44	50	56	66	71	81	46	49	60	72	81	89	49	52	65	76	88	97	51	53	69	80	94	101
72″	75″	77″	44	45	51	58	68	73	83	47	50	61	74	84	91	50	53	67	79	91	100	52	54	71	82	97	104
74″	77″	79″	45	46	53	59	69	75	86	49	51	63	76	86	94	51	55	69	81	93	103	53	56	73	84	99	107
76″	79″	81″	47	47	54	61	71	77	88	50	53	65	78	88	96	53	56	71	83	96	105	55	57	75	87	102	109
78″	81″	83″	48	49	55	62	73	79	90	51	54	66	80	91	99	54	58	72	85	98	108	56	59	77	89	105	112
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84″	87″	89″	52	52	60	67	79	86	97	55	58	71	86	97	106	58	62	78	92	106	117	61	63	83	96	113	121
86″	89″	91″	53	54	61	69	81	88	100	57	60	73	88	100	109	60	63	80	94	108	119	62	65	85	98	115	124
88″	91″	93″	54	55	63	70	83	90	102	58	61	75	90	102	111	61	65	82	96	111	122	64	66	87	100	118	127
90″	93″	95″	55	56	64	72	84	92	104	59	62	77	92	104	114	62	66	84	98	113	125	65	68	88	103	121	130
92″	95″	97″	56	57	65	74	86	94	106	60	64	78	94	107	116	64	68	85	100	116	128	66	69	90	105	123	133
94″	97″	99″	58	59	67	75	88	96	109	62	65	80	96	109	119	65	69	87	103	118	130	68	71	92	107	126	135
96″	99″	101″	59	60	68	77	90	98	111	63	67	82	98	111	122	67	71	89	105	121	133	69	72	94	109	129	138
98″	101″	103″	60	61	70	78	92	100	113	64	68	83	101	114	124	68	72	91	107	124	136	71	74	96	112	131	141
100″	103″	105″	61	62	71	80	94	102	116	66	69	85	103	116	127	69	74	93	109	126	139	72	75	98	114	134	144

*Minimum enclosure height of 5C and 9B2 Units is 21-in.

**These dimensions apply when piping connections are beneath convector.

Specify Convectors by numbers. Convector Number is a combination of type and nominal length.

For Example: A 30-in. long 3B Convector is No. 3B30, a 30-in. long 9B2 is No. 9B230 and a 30-in. long 9B3 is No. 9B330.

For complete information request Catalog No. 273-A.

RATINGS WHEN USED WITH FRONT OR TOP OUTLET ENCLOSURES

Steam or Water Ratings — Sq. Ft. — E. D. R.

Nominal convector length	** Complete enclosure length	** Front panel length	32-in. ENCLOSURE HEIGHT						35-in. ENCLOSURE HEIGHT						40-in. ENCLOSURE HEIGHT						50-in. ENCLOSURE HEIGHT					
			3B	4B	5C	7C	7B	9B3	3B	4B	5C	7C	7B	9B3	3B	4B	5C	7C	7B	9B3	3B	4B	5C	7C	7B	9B3
10″	13″	15″	7	8	10	12	14	18	8	8	10	12	15	18	8	8	11	12	16	19	9	9	11	12	17	20
12″	15″	17″	9	9	12	14	17	21	9	10	13	14	18	22	9	10	13	14	19	23	10	10	13	14	20	24
14″	17″	19″	10	11	14	16	20	25	11	11	15	16	21	26	11	11	15	16	22	26	12	12	16	17	24	28
16″	19″	21″	12	13	16	19	22	28	12	13	17	19	23	29	13	13	17	19	25	30	14	14	18	19	27	32
18″	21″	23″	13	14	18	21	25	32	14	14	19	21	26	33	14	15	19	21	28	34	15	15	20	21	30	36
20″	23″	25″	15	16	20	23	28	35	15	16	21	23	29	37	16	16	21	23	31	38	17	17	22	24	34	40
22″	25″	27″	16	17	22	26	31	39	17	18	23	26	32	40	17	18	24	26	34	42	19	19	24	26	37	44
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40″	43″	45″	30	31	41	47	56	71	31	32	42	47	59	73	32	33	43	47	62	76	34	34	44	48	68	80
42″	45″	47″	31	33	43	49	59	74	32	34	44	49	62	77	33	34	45	49	65	79	36	36	47	50	71	84
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52″	55″	57″	39	41	53	61	73	92	40	42	54	61	76	95	41	42	56	61	81	98	44	44	58	62	88	105
54″	57″	59″	40	42	55	63	76	96	41	43	56	63	79	99	43	44	58	63	84	102	46	46	60	64	91	109
56″	59″	61″	42	44	57	66	78	99	43	45	58	66	82	102	44	46	60	66	87	106	48	48	62	67	95	113
58″	61″	63″	43	45	59	68	81	103	44	46	60	68	85	106	46	47	62	68	90	109	49	49	64	69	98	117
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70″	73″	75″	52	55	71	82	98	124	53	56	73	82	103	128	55	57	75	82	109	132	59	59	78	83	118	141
72″	75″	77″	53	56	73	84	101	127	55	58	75	84	106	131	57	59	77	84	112	136	61	61	80	86	122	145
74″	77″	79″	55	58	75	87	104	131	56	59	77	87	108	135	58	60	79	87	115	140	63	63	82	88	125	149
76″	79″	81″	56	59	77	89	106	134	58	61	79	89	111	139	60	62	81	89	118	143	64	64	84	90	128	153
78″	81″	83″	58	61	79	91	109	138	60	62	81	91	114	142	61	63	83	91	121	147	66	66	86	93	132	157
80″	83″	85″	59	63	81	94	112	141	61	64	83	94	117	146	63	65	85	94	124	151	68	68	89	95	135	161
82″	85″	87″	61	64	83	96	115	145	63	66	85	96	120	150	65	67	88	96	128	155	70	70	91	97	139	165
84″	87″	89″	62	66	85	98	118	149	64	67	87	98	123	153	66	68	90	98	131	159	71	71	93	100	142	169
86″	89″	91″	64	67	87	101	120	152	66	69	89	101	126	157	68	70	92	101	134	162	73	73	95	102	145	173
88″	91″	93″	65	69	89	103	123	156	67	70	92	103	129	160	69	72	94	103	137	166	75	75	98	105	149	177
90″	93″	95″	67	70	91	105	126	159	69	72	94	105	132	164	71	73	96	105	140	170	76	76	100	107	152	181
92″	95″	97″	68	72	93	108	129	163	70	74	96	108	135	168	72	75	98	108	143	174	78	78	102	109	156	185
94″	97″	99″	70	73	95	110	132	166	72	75	98	110	138	171	74	77	100	110	146	177	80	80	104	112	159	189
96″	99″	101″	71	75	98	112	134	170	73	77	100	112	141	175	76	78	103	113	149	181	81	81	106	114	162	193
98″	101″	103″	73	77	100	115	137	173	75	78	102	115	144	179	77	80	105	115	152	185	83	83	109	116	166	197
100″	103″	105″	74	78	102	117	140	177	76	80	104	117	147	182	79	81	107	117	156	189	85	85	111	119	169	201

**These Dimensions apply when piping connections are beneath convector.

Specify Convectors by numbers. Convector Number is a combination of Type and Nominal Length.

For Example: A 30-in. long 3B Convector is No. 3B30, a 30-in. long 9B2 is No. 9B230 and a 30-in. long 9B3 is No. 9B330.

For complete information request Catalog No. 273-A.

National Radiator Corporation

THE MARK OF QUALITY PRODUCTS

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ESTABLISHED 1922

THE NU-WAY CORPORATION

Manufacturers of Automatic and Manually Controlled Oil Burners

ROCK ISLAND, ILL.

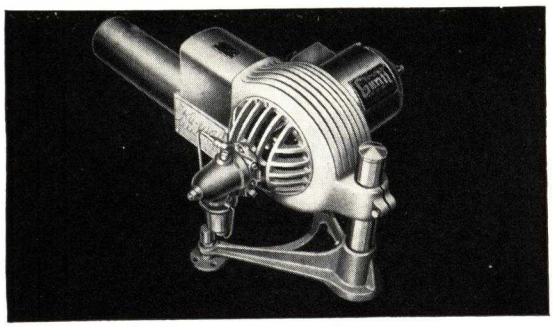
PRODUCTS

NU-WAY "GENII" AUTOMATIC OIL BURNER.
NU-WAY "GENII" HOT WATER GENERATOR.
NU-WAY "GENII" WINTER AIR CONDITIONER.

"Nu-way" Genii

MEMBER OBI OIL BURNER INSTITUTE

NU-WAY "GENII" OIL BURNER



Model LD-25

SIZES AND WORKING DATA

Model	Fuel cap., g.p.h.	Steam radiation, sq. ft.	Hot water radiation, sq. ft.	Warm air grate size, in.	Motor hp.	Controls voltage
MS-V	1¼ to 4	200 to 1200	330 to 1920	14 to 30	1/10	Low
LD-25	1¼ to 4	200 to 1200	330 to 1920	14 to 30	1/6	Low
LD-35	3 to 7	1200 to 3000	1920 to 4800	30 to 36	1/6	Low
LD-55	7 to 19	3000 to 8000	4800 to 12000	36 to 40	1/4	Low

Mechanical Description—Complete automatic control protects against ignition or flame failure; thermostat regulates house temperature, boiler control regulates temperature or pressure, furnace control prevents overheating furnace.

Models LD-25, LD-35 and LD-55 are equipped with a direct driven fuel unit; pump; regulating valve and filter in one.

Pump—Mechanical seal type; self-lubricating, self-priming. With gravity jobs always install a ⅜-in. outside diameter return vent line to tank which eliminates the need for priming after running out of oil.

Ignition Transformer—Non-radio interference type; two-pole mid-point grounded, 10,000-volt intermittent electric arc ignition.

Electrical Current Requirements—110 volts, 60-cycle standard on Models MS-V, LD-25 and LD-35; 220 volts, 60-cycle standard on LD-55.

Oil Specifications—Listed for A.O.B.A. No. 3 oil. Burns No. 2 or No. 1 oil in absence of No. 3.

LISTED AS STANDARD BY THE UNDERWRITERS LABORATORIES

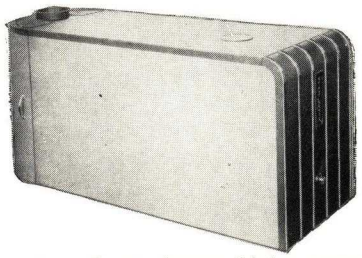
Pressure for Atomization—70 to 100 lbs. Atomization at nozzle; air supplied by Sirocco type fan, quantity controlled by air throttle, delivered through a special air director ring.

Character of Combustion—High radiant energy value, balanced, quiet.

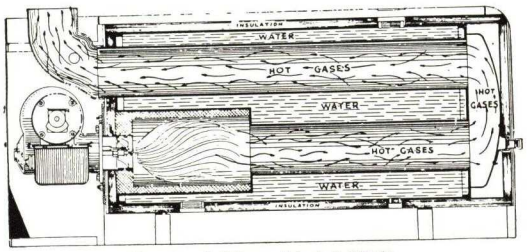
Combustion Chamber—Special Nu-way design, built in ash pit. Special design for any boiler or furnace on request.

Approval—All Nu-way "Genii" Burners carry the Underwriters' Label.

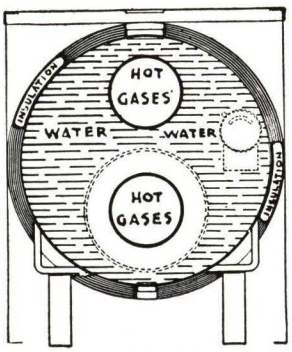
THE NU-WAY "GENII" HOT WATER GENERATOR



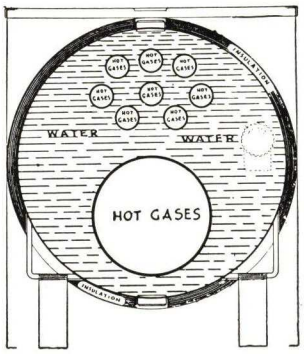
Full automatic operation. Power burner high pressure atomization type, air fed by Sirocco type fan. Electric arc ignition. Internal fired type boiler. Combustion chamber built in at factory. Heavily insulated with Asbestocell. Positively quiet.



Sectional View, Model "W"



Model "W"



Model "WL"

Specifications	Model "W"	Model "WL"
Over-all		
Length	61 in.	66 in.
Height	26½ in.	37 in.
Width	22½ in.	32 in.
Heating surface	18 sq. ft.	33 sq. ft.
Recovery capacity per hr. max. 100° rise	....	170 gal.
Recovery capacity per hr. max. 80° rise	75 gal.	212 gal.
Storage capacity	43 gal.	91.6 gal.
Burner—fuel capacity per hr.	1 gal.	1 to 1.35 gal.
Ignition—electric	Intermittent	Intermittent
Water inlet	2 in.	2 in.
Water outlet	2 in.	2 in.
Drain outlet	¾ in.	¾ in.
Smoke pipe	6 in.	6 in.
Maximum heating load water radiation	....	800 sq. ft.
Domestic hot water per hr. when so used (Indirect coil internally installed at factory)	(None)..	50 gal.
Shipping weight	550 lb.	1200 lb.

Fuel—No. 3, No. 2, No. 1 or 27 plus Diesel on Pacific Coast.
Oil-feed gravity or suction. Equipped with fuel unit, pump-regulating valve and strainer in one unit.

SPENCER HEATER DIVISION

LYCOMING MANUFACTURING COMPANY

WILLIAMSPORT, PA.

SALES REPRESENTATIVES

ALBANY, N. Y.	BOSTON, MASS.	DAYTON, OHIO	NEW YORK, N. Y.	ST. LOUIS, MO.
ALLENTOWN, PA.	BUFFALO, N. Y.	DECATUR, ILL.	PASADENA, CAL.	ST. PAUL, MINN.
BALTIMORE, MD.	CHICAGO, ILL.	HARRISBURG, PA.	PHILADELPHIA, PA.	ST. PETERSBURG, FLA.
BINGHAMTON, N. Y.	CINCINNATI, OHIO	INDIANAPOLIS, IND.	SAN FRANCISCO, CAL.	SYRACUSE, N. Y.
BIRMINGHAM, ALA.	COLUMBUS, OHIO	LOUISVILLE, KY.	SPRINGFIELD, MASS.	WASHINGTON, D. C.

Spencer Automatic Magazine Feed Heaters are made in cast iron sectional types for steam, vapor and hot water heating. Also in steel tubular types for large buildings. There are sizes and capacities to provide economical and convenient heat—safe and sure—for every type of building.

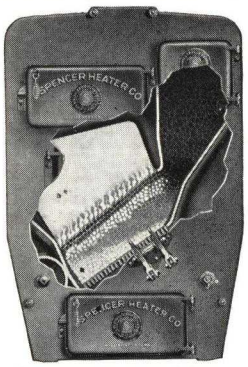
TRADE-MARK

The new Spencer Automatic Magazine Feed Warm Air Furnace now makes available the advantages of the Spencer principle of magazine feed, sloping grates, automatic coal action, and low operating cost—for warm air systems of either gravity or forced circulation type.

THE MOST COMFORTABLE HEAT IN THE WORLD—AND AT LOW COST

Why Spencer Heaters perform so satisfactorily can best be explained by a brief inspection of their design and construction. The Spencer principle—as illustrated in the cross sectional view—is simple:

Once a day fuel is put into the magazine. It fills the sloping grate to the level of the magazine mouth. The fire bed always stays at the proper level for as fast as fuel burns to ash, it shrinks and settles on the sloping grate; and more fuel rolls down automatically over the top of the fire bed. Fuel feed is by gravity alone, in just the right amount to keep the fire always burning at its most efficient combustion point.



Cutaway Sectional View Spencer Cast Iron Heater

This explains why a Spencer Automatic Magazine Feed Heater or Furnace always gives the same uniform, satisfying heat, and burns less coal. These exclusive Spencer advantages are available in all types of the magazine feed heaters and furnaces—either the J or L Series cast iron sectional heaters or the W series furnaces burning low cost No. 1 Buckwheat; the C-N series for larger fuels or the steel magazine feed boilers for large buildings, also burning No. 1 Buckwheat.

Coal-Coke-Gas-Oil—Spencer J and L series heaters, W series furnaces and steel tubular magazine feed boilers are primarily designed to burn low cost No. 1 Buckwheat anthracite and the C-N series Nut or Pea Anthracite or coke.

If at any time a home owner desires to burn more expensive fuels—oil or gas—a Spencer Heater will show a higher efficiency than can be secured with any ordinary boiler.

Thermostats—A Minneapolis Acratherm thermostat and electric damper motor are furnished as optional equipment.

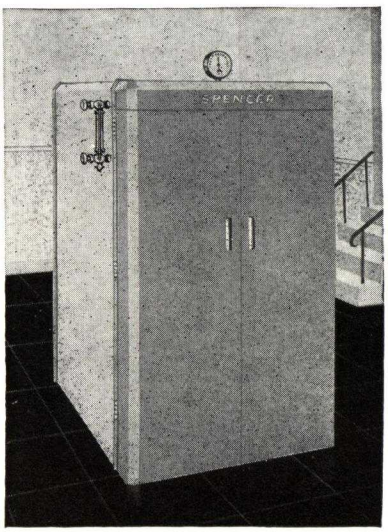
Jacketed Covering—Attractive metallic jackets, as illustrated, are available for Spencer Cast Iron Heaters.

SIZES AND GUARANTEED CAPACITIES—CAST IRON SECTIONAL TYPE

No.	Steam		Water		Tank capacity, gallons	Chimney flue
	*Guaranteed direct cast iron column radiation, loads, sq. ft.	**E. D. R. rating	*Guaranteed direct cast iron column radiation, loads, sq. ft.	**E. D. R. rating		
Buckwheat Burning						
J-3	175	220	290	360	240	8″x 8″x35′
J-4	265	330	440	550	390	8″x 8″x35′
J-5	355	440	590	740	540	8″x 8″x35′
L-105	390	490	645	800	600	8″x 8″x35′
L-106	510	640	845	1050	810	8″x 8″x35′
L-107	630	790	1045	1300	1020	8″x12″x35′
L-205	550	690	910	1140	900	8″x12″x35′
L-206	725	910	1200	1500	1170	8″x12″x35′
L-207	900	1130	1490	1860	1440	8″x12″x40′
L-208	1075	1350	1780	2220	1740	12″x12″x40′
L-209	1250	1570	2070	2580	2040	12″x12″x40′
L-305	1150	1430	1900	2375	.....	12″x12″x40′
L-306	1500	1870	2475	3095	.....	12″x12″x40′
L-307	1850	2310	3050	3815	.....	12″x12″x40′
L-308	2200	2750	3625	4535	.....	12″x16″x45′
L-309	2550	3190	4200	5255	.....	12″x16″x45′
L-310	2900	3630	4775	5975	.....	16″x16″x50′
L-311	3250	4070	5350	6695	.....	16″x16″x50′
Chestnut Burning						
CN-502	280	350	460	575	.....	8″x 8″x30′
CN-502½	360	450	590	735	.....	8″x 8″x30′
CN-503	440	550	725	905	.....	8″x 8″x35′
CN-5K3	520	650	860	1070	.....	8″x 8″x35′
CN-504	600	750	995	1235	.....	8″x12″x35′
CN-5K4	680	850	1130	1400	.....	8″x12″x35′
CN-505	760	950	1265	1565	.....	8″x12″x35′
CN-5K5	840	1050	1400	1730	.....	8″x12″x35′
CN-506	920	1150	1535	1895	.....	8″x12″x45′

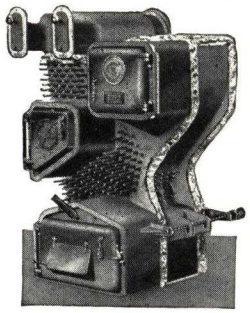
*The Spencer Heater Division guarantees that when installation is made in accordance with accepted standards, the heater will carry the number of feet of direct cast iron column radiation listed. This allows ample provision for heat loss in covered mains, risers and returns, and for peak loads.

**E.D.R. ratings represent the attached net radiation load plus piping losses expressed in square feet of equivalent direct radiation (240 B.t.u. steam, 150 B.t.u. hot water) which may be placed on heater in accordance with accepted standards for economical operation.



L-1 Type Spencer Magazine Feed Heater with Jacket

SPENCER AUTOMATIC MAGAZINE FEED WARM AIR FURNACES



Spencer Warm Air Furnace—Unjacketed

Spencer Furnaces operate on the automatic magazine feed principle. Once the fuel is in the storage magazine, it feeds over the fire on the sloping grates in just the right amounts for the heat required. Attention is necessary only once a day.

Entirely new in warm air furnace design, the Spencer burns low cost No. 1 Buckwheat Anthracite or small size coke, and eliminates all of the disadvantages of the ordinary type of furnace—no "hot spots", no caulking between sections, no brick lined fire pots, no leaky joints. Assures an airtight, gastight, leakproof, long life installation.

Spencer Furnaces are compact, streamlined, and so designed that other air conditioning features can be readily added.

Furnished complete with attractive metallic jacket.

SIZES AND GUARANTEED CAPACITIES

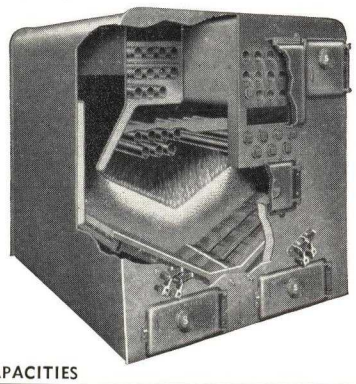
No.	Output		Sq. in. leader pipes	Height casing	Width	Length	Chimney Flue
	B.T.U. at furnace	B.T.U. at register					
W-3	66,000	49,500	364	64″	40½″	32⅝″	8″x 8″x25′
W-4	88,000	66,000	485	64″	42½″	36⅝″	8″x 8″x25′
W-5	110,000	82,500	610	64″	43½″	40⅝″	8″x 8″x30′
W-6	132,000	99,000	730	64″	44½″	44⅝″	8″x 8″x30′
W-7	154,000	115,500	850	64″	45¼″	48⅝″	8″x 8″x30′
W-8	176,000	132,000	970	64″	46″	52⅝″	8″x 8″x30′
W-9	198,000	148,000	1100	64″	46½″	56⅝″	8″x12″x30′

SPENCER STEEL TUBULAR MAGAZINE FEED BOILERS

For larger buildings we recommend Spencer Steel Tubular Boilers, also of the magazine type, burning low cost No. 1 Buckwheat Anthracite or coke.

In the cross-section diagram illustrated, part of the fire bed is cut away to show the sloping grates and the two magazines filled with fresh coal, ready to feed down automatically of its own weight to the fire. These boilers are built in two vertical sections for ease in handling and installation—a great advantage on remodeling or replacement jobs, eliminating necessity of costly tearing out of walls, etc.

Combination water tube and fire tube construction. Built to A. S. M. E. standards.



Cross Section Diagram of Spencer Steel Tubular Magazine Feed Boiler

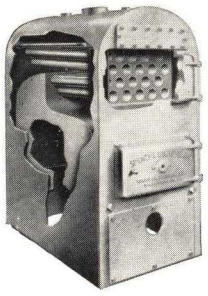
SIZES AND GUARANTEED CAPACITIES

No.	Steam		Chimney flue	No.	Steam		Chimney flue
	*Guaranteed direct cast iron column radiation loads, sq. ft.	**E. D. R. rating			*Guaranteed direct cast iron column radiation, loads, sq. ft.	**E. D. R. rating	
M6-6	2300	2875	12″x12″x40′	M7-9	6100	7625	22″x22″x70′
M6-7	2600	3250	12″x16″x45′	M7-10	6800	8500	22″x22″x70′
M6-8	2900	3625	12″x16″x45′	M8-6	8000	10000	24″x24″x65′
M6-9	3200	4000	16″x16″x50′	M8-7	9750	12185	24″x24″x65′
M6-10	3500	4375	16″x16″x50′	M8-8	11500	14370	30″x30″x70′
M7-6	4000	5000	20″x20″x60′	M8-9	13250	16555	36″x36″x70′
M7-7	4700	5875	20″x20″x60′	M8-10	15000	18740	36″x36″x70′
M7-8	5400	6750	20″x20″x65′				

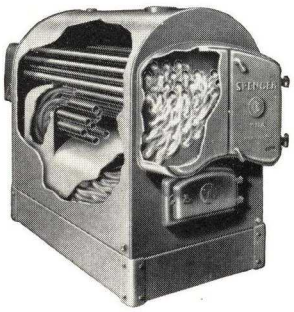
SPENCER STEEL BOILERS FOR OIL, STOKER, GAS OR HAND-FIRING

For more than 40 years, Spencer has been building, in the opinion of experts, one of the most efficient, economical and dependable coal burning boilers on the market. With this background of experience, Spencer Engineers have developed the Spencer Steel Boiler for oil, gas, stoker and hand firing—the "C" series for residential use, and the "Type A" for larger buildings. It is a better boiler, we believe, not only for the property owner, but for the architect or engineer who specifies it.

The high sustained efficiency of these boilers means adequate heat for a lower fuel cost. Design is of the three-pass type. Combustion chamber is amply large. Built of best quality open hearth steel boiler plate, and tubes. Can be furnished with domestic hot water heating coils, either of the storage tank or instantaneous type.



Cutaway Sectional View Spencer "C" Series Steel Boiler



Cutaway Sectional View Spencer Type "A" Steel Boiler

SIZES AND CAPACITIES (S.H.B.I. RATINGS)

	For mechanical firing			Hand firing		Chimney flue		For mechanical firing			Hand firing		Diameter	Height
	Steam	Water		Steam	Water			Steam	Water		Steam	Water		
C-1	600	960	CH1	500	800	8″x 8″x30′	A-1180	2190	3500	A-118	1800	2880	16″	35′
C-2	700	1120	CH2	580	920	8″x 8″x30′	A-1220	2680	4280	A-122	2200	3520	16″	35′
C-3	800	1280	CH3	670	1070	10″x10″x30′	A-2260	3160	5050	A-226	2600	4160	18″	35′
C-4	950	1520	CH4	780	1240	10″x10″x30′	A-2300	3650	5840	A-230	3000	4800	18″	40′
C-5	1100	1760	CH5	910	1450	10″x10″x35′	A-3350	4250	6800	A-335	3500	5600	20″	40′
C-6	1250	2000	CH6	1030	1640	12″x12″x35′	A-3400	4860	7770	A-340	4000	6400	20″	40′
C-7	1450	2320	CH7	1200	1920	12″x12″x35′	A-3450	5470	8750	A-345	4500	7200	22″	45′
C-8	1700	2720	CH8	1410	2250	12″x12″x40′	A-4500	6080	9720	A-450	5000	8000	22″	45′
C-9	1950	3120	CH9	1620	2590	12″x12″x40′	A-4600	7290	11660	A-460	6000	9600	24″	50′
							A-4700	8500	13600	A-470	7000	11200	24″	50′

SUNDSTRAND ENGINEERING CO.

Manufacturers of Sundstrand Oil Burners

ROCKFORD, ILL.

NEW YORK OFFICE, 118 E. 28th Street

THE SUNDSTRAND OIL BURNERS

The Manufacturer

Designed by the same staff of expert engineers and workmen who have for over twenty years been internationally known as precision builders of such products as the famous 10 Key Sundstrand Adding Machine, precision production machinery and hydraulic applications. Automobile, railroad and other industrial shops throughout America and foreign lands, employ precision production machinery designed and built by Sundstrand engineers.

Since placing the first Sundstrand burner on the market in 1921, many important patents have been granted covering original ideas and combinations. Sundstrand was first to use the Triplex Fuel Unit assembly (U. S. Pat. No. 1,883,832)—first to use resilient base motors—first to use double cross couplings—first to use insulated transformers, and first to use the Sundstrand Rota-Roll Fuel Unit, the latest and most important development in oil burner equipment. Constant development has kept Sundstrand in step with the best in the oil burner field.

DESIGN AND CONSTRUCTION

Extremely simple and of pleasing appearance. Sturdily constructed to eliminate vibration and assure quiet operation. Draft tube and air deflector extra heavy to withstand high combustion chamber temperatures. All materials specially selected, machined to high standards of accuracy. Assembled by expert workmen and tested in soundproofed rooms under actual conditions, and as a final test under fire, at not only normal but also at extremely low and high voltages to insure satisfactory operation after installation even under abnormal conditions.

Transformer-Ignition-Nozzle Assembly—A patented Sundstrand feature (U. S. Pat. No. 1,897,310). Entire unit easily removable for inspection, cleaning or adjustment. Sundstrand electric ignition operates only five or ten seconds when burner starts; cuts out automatically immediately combustion begins.

Sundstrand Rota-Roll Fuel Unit—Provides smooth, uniform flow of oil with low power consumption and makes burner remarkably efficient, reliable and economical. Its numerous features and advantages make it notably successful on all types of domestic heating installations, including latest design furnaces, downdraft and marine type boilers.

Reliable and Economical—Assured by simplicity of design, a thoroughness in the arrangement and perfection of a multiplicity of seemingly small but important details, accurate machining, careful assembly and thorough testing at factory. Standard accessories, equipment and controls of the very best used throughout. Sundstrand patented ignition assures prompt combustion. Double strainer protects nozzle and its supply pipe against clogging. Aluminum multivane fan of ample capacity and the distinctive features of Sundstrand Rota-Roll Fuel Unit insure complete and economical burning of low grade fuel oil.

Extremely Quiet—Housing is heavy and well supported and resilient base motor is cushion mounted so vibration noises are absolutely eliminated. Sundstrand Rota-Roll Fuel Unit, quiet in itself, eliminates tank rumbling and vibrations otherwise possible. Perfect admixture of correct volume of air with oil produces a soft, quiet, full floating flame.

No Radio Interference—Because of completely shielded transformer and its construction, radio interference is entirely eliminated, even during that brief period when ignition is on as burner starts.

Easily Installed—In any warm air furnace or boiler. Electric and oil connections made and entire installation completed with practically no interruption of heating service.

Low Price—The Sundstrand All Electric Oil Burner sells at a remarkably low price and represents the best possible oil burner investment. Ask the Sundstrand dealer to give you, without obligation, full details of this precision built oil burner, or write the factory.

Underwriters' Approval

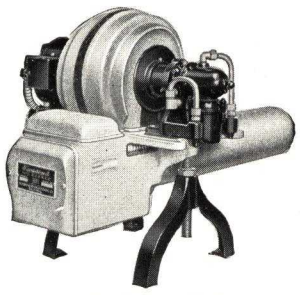
Listed as Standard by Underwriters' Laboratories, Inc.—approved by New York Board of Standards and Appeals, Commonwealth of Massachusetts, Department of State Police, Hartford, Conn., Fire Marshal, Philadelphia, Pa., and it meets all other local and State requirements.

SPECIFICATIONS

	A-3	B-5	C-6
Capacity, g.p.h.	1 to 2 g.p.h.	1 to 4½	5 to 10
Capacity, sq. ft., steam.	700	1500	4000
Motor, hp.	⅛	⅛	⅙
Fan, in.	5 x 3	6 x 3	7½ x 4

Motor—All motors have standard speed of 1725 r.p.m., 110-volt, 60-cycle, single-phase, long hour rating, resilient base, spring mounted, wool packed, bronze sleeve bearings, extremely quiet and free from vibration. Meets all utilities power requirements.

Ignition—All electric. Intermittent. Hot spark. Two-pole, mid-point grounded transformer, designed for heavy duty. Minimum temperature rise, low input. Built-in radio interference eliminator, completely shielded. Entire electric ignition system is tested for a maximum voltage breakdown of 20,000 volts.



Model B-5 and C-6

Ignition and Nozzle Unit—Patented transformer-ignition-nozzle unit. Eliminates all high tension flexible leads. Assures permanent correct relation between ignition points and nozzle. Easily removed for inspection without disturbing installation.

Nozzle—Latest improved design. Disc type, atomizing No. 3 (A.O.B.A.) specifications or lighter oils with fog-like spray. Stainless steel disc and tip insure long life and consistent performance.

Sundstrand Rota-Roll Fuel Unit—Precision built, compact, simple, complete. Eliminates pipe and connections formerly required. Includes pump, strainer and pressure regulation in a single unit. Operates on continuous rotary principle; quiet, practically frictionless. Highly efficient. Reduces power requirement and operation cost, increases reliability, durability and economy of burner. Pump capacity, 22 gal. per hour. Double screening surface, total area 24 sq. in. Pressure range 90 to 150 lbs. per sq. in. Maximum vacuum 27 in. Will operate at maximum pressure and vacuum requirements without a murmur. Latest and most important development in the oil burner field.

Drive—Direct, through double cross cushioned coupling.

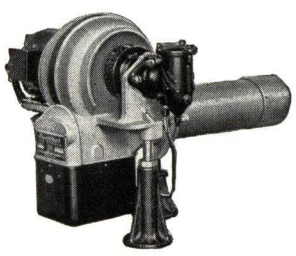
Fan—Light cast aluminum multivane, weighing only from ½ to 1½ lbs. according to size. Statically balanced. Mounted directly on motor shaft.

Fan Filter—An exclusive Sundstrand feature. Assures full capacity of fan at all times by eliminating possibility of dust and grit accumulating on fins. Easily accessible for cleaning by removing a single setscrew on main casting.

Controls—Latest approved type, low voltage, including: room thermostat, boiler or furnace limit switch, combustion control.

Finish—Available in three different colors: midnight blue, gray green or Mohawk red of the attractive art metal crystalline and black enamel combination.

Fuel Supply—Optional. Either from basement storage tank or from outside underground storage tank.



Model A-3

THE TITUSVILLE IRON WORKS COMPANY

DIVISION OF STRUTHERS-WELLS-TITUSVILLE CORPORATION

Boilers and Tanks, Riveted and Welded Steel Plate Work

TITUSVILLE, PA.

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WASHINGTON, D. C., W. A. Rogers
YOUNGSTOWN, OHIO, Industrial Sales Co.

Products

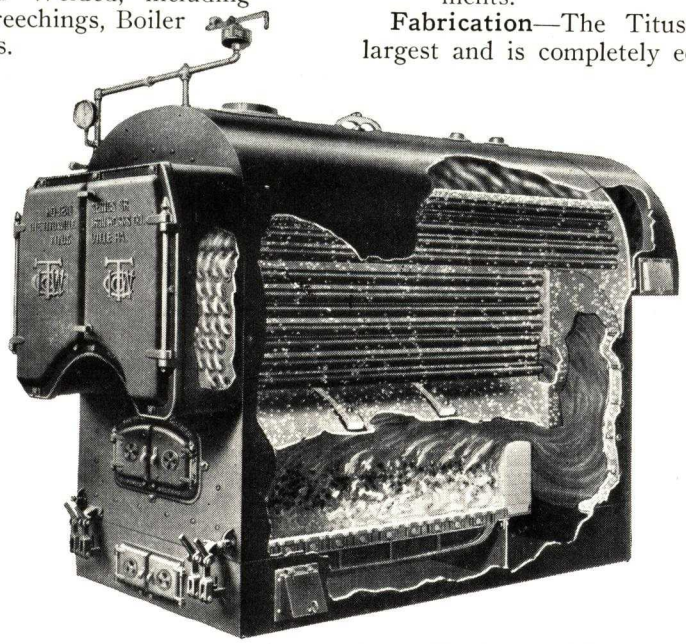
FIRETUBE STEEL BOILERS for power and heating.

Also Heaters, Exhaust or Live Steam; Steel Plate Work, Riveted and Welded, including Tanks, Smokestacks and Breechings, Boiler Fronts, Grates and Castings.

Heating Boilers for Coal, Gas, Oil or Stoker Firing

The Company specializes in low pressure heating boilers and builds a complete range of designs and sizes. Large stocks of tubes and plates are carried to facilitate speedy execution of orders. Standard firebox boilers, riveted and welded, are stocked in the popular sizes.

Welding — All seams of Titusville welded boilers are welded *inside* and outside by electric-arc machines, in the hands of experts who do nothing else. Our welding technique is of outstanding merit.



Cross Sectional View Titusville Series "SR" Compact Boilers

Power Boilers for Coal, Gas, Oil or Stoker Firing

All Titusville Boilers are designed in strict accordance with the latest code of the A.S.M.E., or can be made to conform to local requirements.

Fabrication—The Titusville Plant is one of the largest and is completely equipped with the latest improved machinery, including best hydraulic flanging equipment and pneumatic and hydraulic riveting machines. The highest standards of workmanship prevail.

Inspection and Test—All boilers are thoroughly inspected during their entire construction by a representative of the Hartford Steam Boiler Inspection & Insurance Co., who is in continual attendance at our works. Boilers are tested to required hydrostatic pressure, made absolutely tight and stamped "ASME." All workmanship and material are guaranteed first class in every respect. The insurance company's test certificate is furnished if desired.

TITUSVILLE FEATURES OF DESIGN AND CONSTRUCTION

1. All Series "SR" Boilers—Built with Titusville Self-cleaning, Self-supporting type *firebox*. Crown sheet so designed to allow all sediment to drop down to bottom of boiler where it can be easily flushed out.

2. Crown Bars—Give added strength to the round top furnace which has strength due to shape and there are no obstructions or chilling surfaces introduced in the furnace to make smoke.

3. Water Content of Boilers—Split up where necessary for quick steaming with no dead end pockets to retard circulation. Large volumes of water adjoin the hottest parts of boiler permitting the useful heat of combustion to be readily absorbed.

4 Water Line—Remains steady with rapid circulation as the entire surface at water line is free of obstruction. This means dry steam for use in radiation.

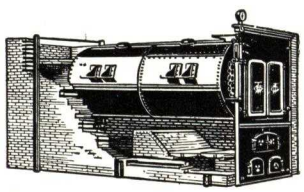
5. Reserve Supply of Dry Steam—Of large volume, due to the height and width of steam space extending unbroken from end to end of boiler.

6. Steam Liberating Surface at the Water Line—A large, free area to prevent priming.

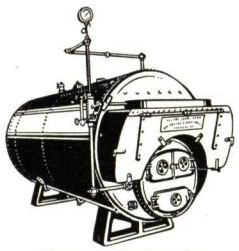
7. All Heating Surfaces under Water—Makes them effective for steam production. Handholes on both sides at level of crown. Water column connections are on both sides.

8. Three-pass Type Compact Placing of Heating Surfaces—Permits rapid, free circulation of water and gives the hot gases time to give up their heat, resulting in low temperature to stack gases.

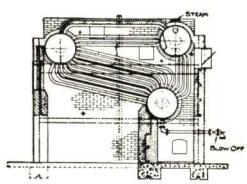
9. Large Volume Obtained by Combining Furnace with Combustion Chamber—Gives the necessary long flame travel with the time required for primary and secondary air to properly act. Complete combustion results.



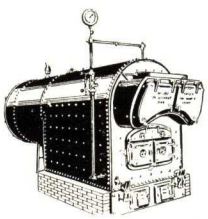
Series "HRT" Horizontal Return Tubular Boiler for Power and Heating



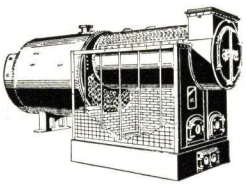
Scotch Boiler for Power and Low Pressure Heating



3-Drum Bent Tube Boiler, Low Head Type, Built to 500 Hp.



Series "R" Riveted Low Pressure Fire-box Boiler

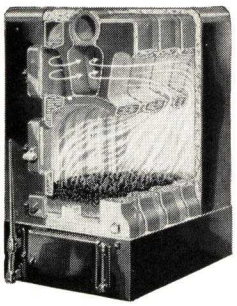


Series "XL" Return Tubular Boiler

UNITED STATES RADIATOR CORPORATION

Manufacturers of Capitol Boilers, Radiators, Air Conditioning, Pacific Boilers

GENERAL OFFICES
DETROIT, MICH.
BRANCHES AND SALES OFFICES IN PRINCIPAL CITIES

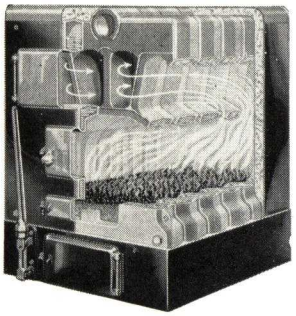


Series "A" Red Top Boiler

SERIES "A" RED TOP BOILERS

For All Fuels Direct cast iron radiator loads, sq. ft.			For Oil Direct cast iron radiator loads, sq. ft.		
Boiler No.	Steam	Water	Boiler No.	Steam	Water
A- 6	280	460	A-06	280	450
A- 7	355	585	A-07	340	545
A- 8	430	710	A-08	400	640
A- 9	505	835	A-09	460	735
A-10	580	960	A-010	520	830
A-11	655	1085	A-011	580	925

Height, including trimmings, 49⅝ in.; width 32⅞ in. Height of water line 42½ in.

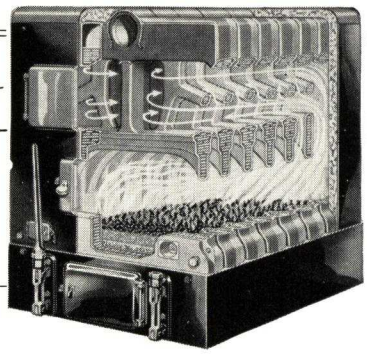


Fire Travel "B" Series Red Top Boiler

SERIES "B" FOR ALL FUELS AND SMOKELESS TYPES*

For All Fuels Direct cast iron radiator loads, sq. ft.			For Oil Direct cast iron radiator loads, sq. ft.		
Boiler No.	Steam	Water	Boiler No.	Steam	Water
B- 6	550	910	B-07	735	1215
B- 7	735	1215	B-08	920	1520
B- 8	920	1520	B-09	1105	1825
*B- 9	1105	1825	B-010	1290	2130
*B-10	1290	2130	B-011	1475	2435
*B-11	1475	2435	B-012	1660	2740
*B-12	1660	2740	B-013	1845	3045
*B-13	1845	3045	B-014	2030	3350
*B-14	2030	3350			

Height, including trimmings, 65⅞ in.; width, 42⅝ in. Height of water line, 46½ in. *Sizes marked * furnished in smokeless type. B-13 and B-14 not furnished in all fuels type. Extra high base furnished for stoker firing.

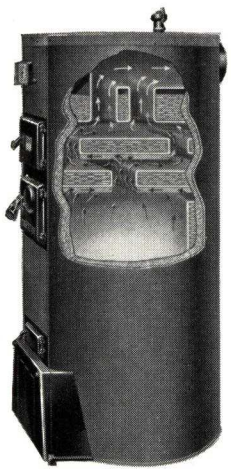


Cut-away Section Series "C" Red Top Boiler

SERIES "C" RED TOP BOILERS

For All Fuels Direct cast iron radiator loads, sq. ft.			For Oil Direct cast iron radiator loads, sq. ft.		
Boiler No.	Steam	Water	Boiler No.	Steam	Water
C-12	1865	3080	C-012	1865	3080
*C-14	2375	3920	C-014	2375	3920
*C-16	2930	4840	C-016	2930	4840
*C-18	3485	5750	C-018	3485	5750
*C-20	4050	6680	C-020	4050	6680
*C-22	4575	7550	C-022	4575	7550
*C-24	5045	8320	C-024	5045	8320
*C-26	5455	9000	C-026	5455	9000
*C-28	5805	9580	C-028	5805	9580

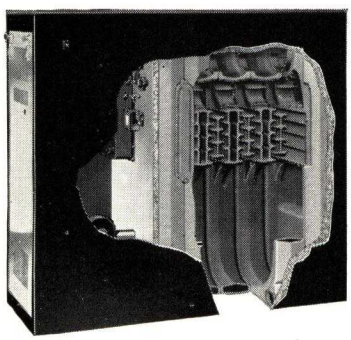
Height including trimmings, 73¾ in.; width 54¼ in.
Height of water line 55 in.
*Sizes marked * furnished in smokeless type.



Oil Burning Red Cap F.S. Type Boiler

CAPITOL RED CAP BOILERS

For All Fuels					Oil Burning and F.S. Type				
Boiler No.	Direct cast iron radiator loads square feet		Diameter at hearth, inches	Water line, inches	Boiler No.	Direct cast iron radiator loads square feet		Diameter at hearth, inches	Water line, inches
	Steam	Water				Steam	Water		
19-4	300	495	46⅞	1.76	O-19-4	300	495	17½	46⅞
19-5	350	580	51 11/16	1.76	O-19-5	350	580	17½	51 11/16
20-4	400	660	46⅞	2.24	O-20-4	400	660	19¾	46⅞
20-5	450	745	51 11/16	2.24	O-20-5	450	745	19¾	51 11/16
22-4	500	825	46⅞	2.76	O-22-4	500	825	22	46⅞
22-5	550	910	51 11/16	2.76	O-22-5	550	910	22	51 11/16
25-4	625	1030	47½	3.54	O-25-4	625	1030	25	47½
25-5	675	1115	52 5/16	3.54	O-25-5	675	1115	25	52 5/16



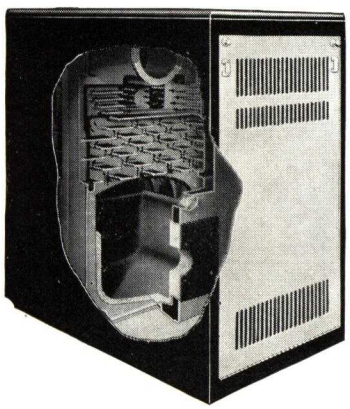
U.S.-20 Oil Burning Boiler

CAPITOL U-S-20 AND U-S-25 OIL BURNING BOILERS*

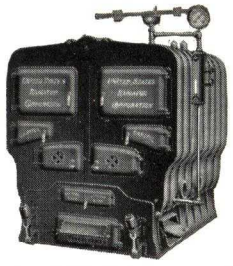
Ratings U.S.20		U.S. 20-3	U.S. 20-4	U.S. 20-5	U.S. 20-6
Direct C.I. Radiator load sq. ft. 4,000 B.t.u. transmission rate.	Steam...	290	415	540	665
Nothing need be added for piping and pickup. See Standard Requirements in our Literature.	Water...	460	665	865	1060

**Ratings U.S.25	U.S. 25-3	U.S. 25-4	U.S. 25-5	U.S. 25-6	U.S. 25-7
***(Choose boiler size radiator load from this load).					
Steam, sq. ft.....	500	800	1080	1335	1500
Water, sq. ft.....	800	1280	1730	2135	2400

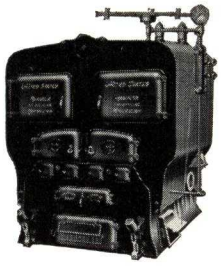
*Biltin Taco Heaters of various capacities can be furnished for these boilers—and openings are provided for all automatic control equipment.
**All ratings expressed in square feet are based on a heat emission of 240 B.t.u. per sq. ft. for steam and 150 B.t.u. per sq. ft. for hot water.
***Nothing need be added for piping and pickup. See Standard Requirements in our literature.



U.S.-25 Oil Burning Boiler



Capitol WN-270 Series Boiler



Capitol 50-in. Series Smokeless Boiler

Capitol 4111 Square Boiler

WN270 AND WN0270 SERIES

Boiler No. all fuels	Direct cast iron radiator load, square feet		Boiler No. oil burning	Direct cast iron radiator load, square feet		Grate area, square feet	Minimum chimney sizes	
	Steam	Water		Steam	Water		Height, feet	Dimensions, inches
WN276	3700	6105	.....	.....	.....	15.25	50	20x24
WN277	4300	7095	.....	.....	.....	18.29	55	24x24
WN278	4900	8085	.....	.....	.....	21.33	60	24x24
WN279	5500	9075	WNO279	6200	10230	24.37	60	24x24
WN280	6100	10065	WNO280	6900	11400	27.41	65	24x28
WN281	6700	11055	WNO281	7600	12550	30.45	70	28x28
WN282	7300	12045	WNO282	8300	13700	30.45	70	28x28
WN283	7900	13035	WNO283	9000	14850	30.45	75	28x32
WN284	8500	14025	WNO284	9700	16000	30.45	80	28x32
.....	.....	.....	WNO285	10400	17150	.....	90	32x32
.....	.....	.....	WNO286	11100	18300	.....	100	32x32

Inclusive of trimmings—height, 92 in.; width, 82 in. Height of water line, 66 in.

Furnished with extra high bases for stoker firing.

4100 AND 0400 SERIES

Boiler No. all fuels	Direct cast iron radiator load, square feet		Grate area, square feet	Minimum chimney sizes	
	Steam	Water		Height, feet	Dimensions, inches
4106	2000	3300	10.31	45	18x18
4107	2500	4125	12.47	50	18x18
4108	3000	4950	14.63	55	18x20
4109	3500	5775	16.79	60	20x20
4110	4000	6600	18.95	65	20x24
4111	4500	7425	21.11	70	24x24
.....	4900	8085	.....	70	24x28
.....	5400	8910	.....	75	24x28
.....	5800	9570	.....	80	24x28

40-INCH SMOKELESS

Boiler No.	Direct cast iron radiator loads, square feet		Grate area, square feet	Minimum chimney sizes	
	Steam	Water		Height, feet	Dimensions, inches
740	2500	4125	8.15	50	18x18
840	3000	4950	10.31	55	18x20
940	3500	5775	10.31	60	20x20
1040	4000	6600	12.47	65	20x24
1140	4500	7425	14.63	70	24x24
1240	4900	8085	14.63	70	24x28
1340	5400	8910	16.79	75	24x28

Height including trimmings, 71 in.; width, 75 in.
Height of water line, 49 in.

50-INCH ALL FUEL AND 0500 SERIES

Boiler No. all fuels	Boiler No. oil burning	Direct cast iron radiator load, square feet		Grate area, square feet	Minimum chimney sizes	
		Steam	Water		Height, feet	Dimensions inches
750	....	4700	7755	18.29	55	24x24
850	....	5350	8825	21.33	60	24x24
950	0509	5850	9655	24.37	65	24x28
1050	0510	6500	10725	27.41	70	24x28
1150	0511	7000	11550	30.45	80	28x28
1250	0512	7650	12620	30.45	90	28x28
1350	0513	8150	13450	30.45	95	28x32
....	0514	8650	14280	.....	100	28x32
....	0515	9150	15100	.....	105	32x32
....	0516	9650	15920	.....	110	32x32

50-INCH SMOKELESS

Boiler No. all fuels	Direct cast iron radiator load, square feet		Grate area, square feet	Minimum chimney sizes	
	Steam	Water		Height, feet	Dimensions, inches
750	4700	7755	18.29	55	24x24
850	5350	8825	21.33	60	24x24
950	5850	9655	21.33	65	24x28
1050	6500	10725	24.37	70	24x28
1150	7000	11550	24.37	80	28x28
1250	7650	12620	27.41	90	28x32
1350	8150	13450	27.41	95	32x32

Height including trimmings, 92 in.; width, 82 in.
Height of water line, 66 in.

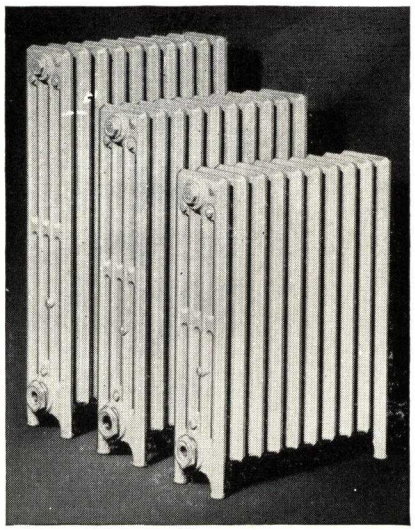
CAPITOLAIRE OIL FIRED CONDITIONING UNIT

Riveted and welded body ..... 20″
B.t.u. at register 100,000
Blower No. A1-122
Motor h.p. ..... ¼
R.p.m. range ..... 338 to 467
Normal c.f.m. 1300
C.f.m. range variable speed ..... 1200 to 2000
Number and size of filters, in. ..... 2—26x25
Blower pulley size, in. 11x1
Blower wheel, in. 12½
Motor pulley size, in. ..... 3¼ x ½
Belt length, in. 56
Approx. heating surface, sq. in. 6000
Smoke pipe diameter, in. 8
Size plenum chamber, in. 20x20
Blower hood size, in. 20x20
Cabinet:
Width, in. 52
Depth, in. 44
Height, in. 60

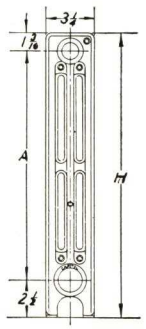
Write to CAPITOLAIRE Division of UNITED STATES RADIATOR CORPORATION for complete catalog of Direct Fired Furnaces and all types of air conditioning equipment.

UNITED STATES RADIATOR CORPORATION

CAPITAL THIN TUBE RADIATORS

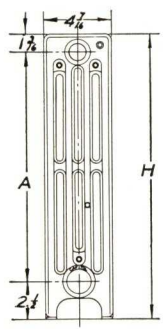


Three-Tube Thin Tube



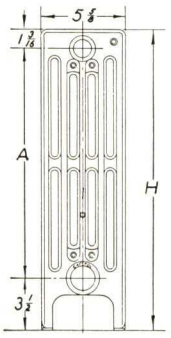
Size	A	H
19-3	15 5/16"	19"
22-3	18 5/16"	22"
25-3	21 5/16"	25"

Four-Tube Thin Tube



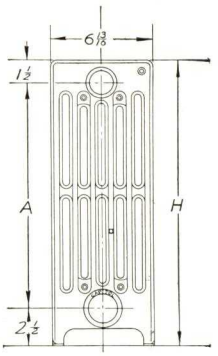
Size	A	H
19-4	15 5/16"	19"
22-4	18 5/16"	22"
25-4	21 5/16"	25"

Five-Tube Thin Tube



Size	A	H
20-5	15 5/16"	20"
23-5	18 5/16"	23"
26-5	21 5/16"	26"

Six-Tube Thin Tube

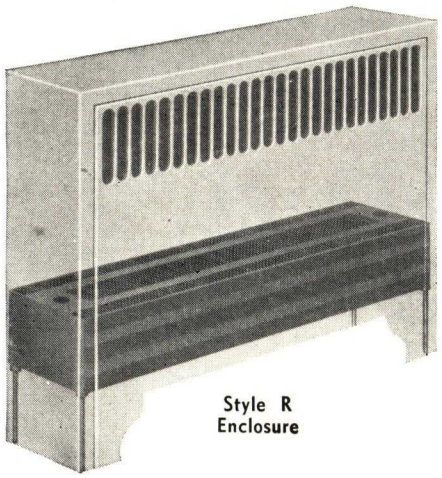


Size	A	H
19-6	15"	19"

DIMENSIONS AND RATING FOR CAPITAL THIN TUBE RADIATORS

Number of sections	* Length 1½ inch per section	3-Tube Heating Surface—Sq. Ft. 19-in. height 1.1 sq. ft. per section	3-Tube 22-in. height 1.3 sq. ft. per section	3-Tube 25-in. height 1.5 sq. ft. per section	4-Tube Heating Surface—Sq. Ft. 19-in. height 1.4 sq. ft. per section	4-Tube 22-in. height 1.6 sq. ft. per section	4-Tube 25-in. height 1.8 sq. ft. per section	5-Tube Heating Surface—Sq. Ft. 20-in. height 1.8 sq. ft. per section	5-Tube 23-in. height 2.1 sq. ft. per section	5-Tube 26-in. height 2.4 sq. ft. per section	6-Tube Heating Surface—Sq. Ft. 19-in. height 2.2 sq. ft. per section	Number of sections	* Length 1½ inch per section
2	3	2.2	2.6	3.0	2.8	3.2	3.6	3.6	4.2	4.8	4.4	2	3
4	6	4.4	5.2	6.0	5.6	6.4	7.2	7.2	8.4	9.6	8.8	4	6
6	9	6.6	7.8	9.0	8.4	9.6	10.8	10.8	12.6	14.4	13.2	6	9
8	12	8.8	10.4	12.0	11.2	12.8	14.4	14.4	16.8	19.2	17.6	8	12
10	15	11.0	13.0	15.0	14.0	16.0	18.0	18.0	21.0	24.0	22.0	10	15
12	18	13.2	15.6	18.0	16.8	19.2	21.6	21.6	25.2	28.8	26.4	12	18
14	21	15.4	18.2	21.0	19.6	22.4	25.2	25.2	29.4	33.6	30.8	14	21
16	24	17.6	20.8	24.0	22.4	25.6	28.8	28.8	33.6	38.4	35.2	16	24
18	27	19.8	23.4	27.0	25.2	28.8	32.4	32.4	37.8	43.2	39.6	18	27
20	30	22.0	26.0	30.0	28.0	32.0	36.0	36.0	42.0	48.0	44.0	20	30
22	33	24.2	28.6	33.0	30.8	35.2	39.6	39.6	46.2	52.8	48.4	22	33
24	36	26.4	31.2	36.0	33.6	38.4	43.2	43.2	50.4	57.6	52.8	24	36
26	39	28.6	33.8	39.0	36.4	41.6	46.8	46.8	54.6	62.4	57.2	26	39
28	42	30.8	36.4	42.0	39.2	44.8	50.4	50.4	58.8	67.2	61.6	28	42
30	45	33.0	39.0	45.0	42.0	48.0	54.0	54.0	63.0	72.0	66.0	30	45
32	48	35.2	41.6	48.0	44.8	51.2	57.6	57.6	67.2	76.8	70.4	32	48
34	51	37.4	44.2	51.0	47.6	54.4	61.2	61.2	71.4	81.6	74.8	34	51
36	54	39.6	46.8	54.0	50.4	57.6	64.8	64.8	75.6	86.4	79.2	36	54
38	57	41.8	49.4	57.0	53.2	60.8	68.4	68.4	79.8	91.2	83.6	38	57
40	60	44.0	52.0	60.0	56.0	64.0	72.0	72.0	84.0	96.0	88.0	40	60
42	63	46.2	54.6	63.0	58.8	67.2	75.6	75.6	88.2	100.8	92.4	42	63
44	66	48.4	57.2	66.0	61.6	70.4	79.2	79.2	92.4	105.6	96.8	44	66
46	69	50.6	59.8	69.0	64.4	73.6	82.8	82.8	96.6	110.4	101.2	46	69
48	72	52.8	62.4	72.0	67.2	76.8	86.4	86.4	100.8	115.2	105.6	48	72
50	75	55.0	65.0	75.0	70.0	80.0	90.0	90.0	105.0	120.0	110.0	50	75
Sq. ft. per lineal inch		0.733	0.867	1.000	0.933	1.067	1.200	1.200	1.400	1.600	1.470	Sq. ft. per lineal inch	

*Add ½ in. to length for each bushing. 3, 4 and 5-Tube—Tapped—Top, 1 in. both ends—Bottom, 1¼ in. both ends 6-Tube—Tapped—Top, 1¼ in. both ends—Bottom, 1½ in. both ends. Regularly furnished in 3-tube, 4-tube and 6-tube with legs measuring 2½ in. from floor to center of bottom tapping. Regularly furnished in 5-tube with legs measuring 3½ in. from floor to center of bottom tapping. On special order can be furnished with 4½-in. legs or legless.



Style R
Enclosure

CAPITOL FINCAST CONVECTORS

Steam or Water Ratings
Front Outlet Grille

Steam in Convector at 215°—Square Feet Equivalent 240 B.t.u.

Water—Average Temperature in Convector 185°—Square Feet Equivalent 150 B.t.u.

Stack* height, inches	Convector lengths, inches													
	18	23	28	33	38	43	48	53	58	63	68	73	78	83
No. 3 Convector—3½-inch depth														
14	10	13	16	19	22	24	27	30	33	36	.....	.....	.....	.....
17	11	15	18	21	24	27	30	33	37	40	.....	.....	.....	.....
20	12	16	19	22	26	29	33	36	39	43	.....	.....	.....	.....
24	13	17	20	24	28	31	35	38	42	46	.....	.....	.....	.....
30	14	18	22	25	29	33	37	41	45	49	.....	.....	.....	.....
36	15	19	23	27	31	35	39	43	47	51	.....	.....	.....	.....
48	16	20	24	28	33	37	41	46	50	54	.....	.....	.....	.....
60	16	21	25	30	34	39	44	48	53	57	.....	.....	.....	.....
No. 5 Convector—5⅜-inch depth														
14	14	18	22	25	29	33	37	41	45	48	52	56	60	64
17	16	20	25	29	34	38	42	47	51	56	60	64	69	73
20	17	22	27	32	37	42	46	51	56	61	66	71	76	80
24	19	25	30	36	41	46	52	57	62	68	73	79	84	89
30	22	27	33	39	45	51	57	63	69	75	81	87	93	99
36	23	29	36	42	48	55	61	67	74	80	86	93	99	105
48	25	32	39	46	53	60	67	74	80	87	94	101	108	115
60	26	34	41	48	56	63	70	78	85	92	100	107	114	122
No. 7 Convector—7¼-inch depth														
14	18	23	28	33	38	43	48	53	58	63	68	73	78	83
17	21	27	33	38	44	50	56	62	67	73	79	85	90	96
20	23	29	36	42	49	55	61	68	74	81	87	93	100	106
24	25	32	39	46	53	60	67	74	81	88	95	101	108	115
30	27	35	42	49	57	64	72	79	87	94	102	109	117	124
36	28	36	44	52	60	68	76	83	91	99	107	115	123	131
48	31	39	47	56	64	73	81	90	98	107	115	124	132	141
60	32	41	50	59	68	77	86	95	104	113	122	131	140	148
No. 10 Convector—10⅝-inch depth														
14	23	29	36	42	48	55	61	67	74	80	86	93	99	105
17	26	34	41	48	56	63	70	78	85	92	100	107	114	122
20	29	37	46	54	62	70	78	86	95	103	111	119	127	135
24	32	41	50	59	68	77	86	95	104	113	122	131	140	149
30	35	45	55	65	74	84	94	104	113	123	133	143	153	162
36	37	47	58	68	78	89	99	109	119	130	140	150	161	171
48	40	51	62	73	84	95	106	117	128	139	150	161	172	183
60	42	54	65	77	89	100	112	124	135	147	159	170	182	194

*Stack height is the distance from the bottom of convector to top of air outlet grille.
Style R enclosures are 6 inches higher than stack height. They are furnished in 20, 23, 26, 30 and 36-inch heights.
Ratings shown on this sheet include an allowance for heating effect generally referred to as Available Heat Rating.

When Top Outlet Grilles are used, the Above Ratings Should be Increased as Follows:—

14-in. Stack Height multiply above ratings by 1.16
17-in. Stack Height multiply above ratings by 1.12
20-in. Stack Height multiply above ratings by 1.09
24-in. Stack Height multiply above ratings by 1.07

***CONVERSION FACTORS WHEN AVERAGE WATER TEMPERATURE IN FINCAST CONVECTOR IS OTHER THAN 185 DEGREES**

Average water temperature in convector	Multiply ratings above by	Average water temperature in convector	Multiply ratings above by	Average water temperature in convector	Multiply ratings above by
220 degrees	1.35	190 degrees	1.10	170 degrees	.85
210 degrees	1.30	185 degrees	1.00	165 degrees	.80
200 degrees	1.20	180 degrees	.95	160 degrees	.75
195 degrees	1.15	175 degrees	.90		

*To select boiler size, obtain standing radiator load—sq. ft. equivalent 150 B.t.u.—by dividing total B.t.u. requirements by 150 B.t.u.

BRANCH AND SALES OFFICES

*BALTIMORE, MD.
1309 Court Square Bldg.

*BIRMINGHAM, ALA.
1529 Second Ave., So.

*BOSTON, MASS.
233 Vassar St., Cambridge, Mass.

BRONX, N. Y.
841 E. 135th St.

BUFFALO, N. Y.
303 Crosby Bldg.

*CHICAGO, ILL.
3254 No. Kilbourn Ave.

*CINCINNATI, OHIO
Wayne St. and C. L. & N. R. R.

CLEVELAND, OHIO
3221 Carnegie Ave.

COLUMBUS, OHIO
1328 Virginia Ave.

*DAVENPORT, IOWA
1803 Rockingham Road

*DENVER, COLO.
2474 Blake St.

*DETROIT, MICH.
127 Campbell Ave.

*HARRISON, N. J.
Davis and Central Aves.

INDIANAPOLIS, IND.
314 E. New York St.

*KANSAS CITY, MO.
1219-1221 W. Eleventh St.

LOUISVILLE, KY., 615 State St.

*MASPETH, L. I., N. Y.
Grand Ave. and 57th St.

*MILWAUKEE, WIS.
532 E. Corcoran Ave.

*MINNEAPOLIS, MINN.
901 Washington Ave., So.

*NEW HAVEN, CONN.
Chapel and Mill Sts.

NEW YORK, N. Y.
Room 607-8, 101 Park Ave.

OMAHA, NEB.
1101 Jackson St.

*PHILADELPHIA, PA.
22nd St. and Sedgley Ave.

*PITTSBURGH, PA.
941 Behan St., N. S.

*PORTLAND, ME.
2-4 Martyr St.

*PROVIDENCE, R. I.
336 Allen's Ave.

*READING, PA.
435 No. Front St.

ROCHESTER, N. Y.
877 Genessee Park Blvd.

*ST. LOUIS, MO.
4004 Duncan Ave.

*SAN FRANCISCO, CAL.
753 Bryant St.

*SEATTLE, WASH.
Boren Ave. and Harrison St.

*SPRINGFIELD, MASS.
North Maine St.

*TROY, N. Y.
Center St., Green Island

WASHINGTON, D. C.
410 Bond Bldg.

Assembling plants located at points indicated by star.

MEMORANDA

WILLIAMS OIL-O-MATIC HEATING CORPORATION

Manufacturers of Automatic and Manually Controlled Fuel Oil Burners

BLOOMINGTON, ILL.

SERVICE TO ARCHITECTS AND BUILDERS

CHICAGO, 641 No. Michigan Avenue — NEW YORK, 1231 Graybar Building

For Williams Air Conditioning Equipment and Ice-O-Matic Refrigeration Equipment, see File Index

A Complete Line

WILLIAMS OIL-O-MATIC HEATING

Williams Oil-O-Matic offers a complete line of oil heating equipment; six Oil-O-Matic burner models—a genuine Williams Oil-O-Matic of ideal capacity for every size and type of house, for every apartment, public building or commercial structure. Also, the new Williams HP-3 (high pressure) model.

New complete boiler-burner and furnace-burner units; a new and revolutionary type of oil-burning automatic water heater; and a new oil-burning range burner for heavy duty ranges are available.

HEATING CAPACITIES OF THE VARIOUS WILLIAMS OIL-O-MATIC BURNERS

	Domestic shipping weight, lbs.	Lgth., in.	Wth., in.	Ht., in.	Hp.	R.p.m.	Gals. fuel oil for operating hour	
							Minimum	Maximum
Model K-150	125	29	15¼	19¾	1/10	1800	½	1½
Model K-3	145	30	15⅝	20¾	1/10	1800	1	3
Model K-4.5	170	33½	20¼	22¼	⅕	1800	2½	4½
Model K-7	175	32½	22¼	21¾	⅕	1800	4	7
Model J-1800	255	45	20	24	½	1800	8	15
Model JJ	295	50	32	24	1	1800	12	25
HP-3 (High Pressure)	115	30	17	18	1/10	1800	1.35	3

Standard draft pipe 18 in. 12-in. length draft pipe optional.
Standard electric current is 110-volt, 60-cycle. In case odd frequency motors are used, the maximum capacity of the burner will be reduced in direct proportion to the r.p.m. of the motor. The minimum capacity remains the same.

WATER HEATERS

WHA*	600	57	22½	28	1/10	1800	.....	½
WHB**	885	75	23	28	1/10	1800	½	1
WHC***	1385	90	29	34	1/10	1800	1	1¾

*Output: 90° F. rise, 60 gal. per hour. **Output: 90° F. rise, 120 gal. per hour. ***Output: 90° F. rise, 210 gal. per hour.

How To Decide Size of Burner

For low pressure domestic boilers, 1 gal. of fuel oil per hour (140,000 b.t.u.'s) is required for approximately:
300 sq. ft. of steam radiation or its equivalent.
480 sq. ft. of hot water radiation or its equivalent.
70,000 b.t.u's when using hot air furnace ratings.
24 sq. ft. steam boiler heating surface (or 2.2 hp.).
For exact detail data, see Oil-O-Matic Installation and Service Manual.

Oil-O-Matic Hot Water Supply

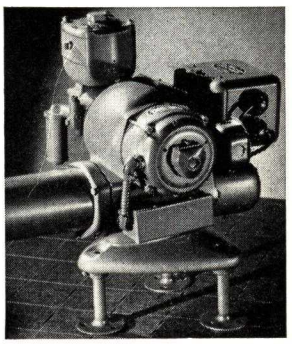
A new efficient hot water supply unit made in 3 sizes covering ordinary home use, large home or commercial use, and heavy duty requirement. The entire apparatus—including Oil-O-Matic oil burner, combustion chamber, water reservoir, and all automatic controls—is combined in one compact unit. Tank being horizontal instead of vertical, permits the use of a unique triple flame travel; the hot fire traversing the length of the tank three times before escaping, transfers all possible heat to the water. See specifications above.

The unit illustrated WHA, will deliver 60 gal. of hot water per hour, raised 90° F. in temperature, which is equivalent to a constant flow capacity of 1 gal. of very hot water per minute, using ½ gal. of fuel oil per operating hour. WHB has twice, WHC has three and one-half times, the capacity of WHA.

Complete Boiler-Burner And Furnace-Burner Units

Oil-O-Matic burners are also used as an integral part of the following boiler burner and furnace burner units:

Abram-Cox Oil-O-Matic
American Foundry & Furnace Oil-O-Matic
Evans Oil-O-Matic
International Oil-O-Matic
Kruse Oil-O-Matic
National Oil-O-Matic
Orr & Sembower Oil-O-Matic
Waterman-Waterbury Oil-O-Matic
Weir Oil-O-Matic



Complete heating plants in which Oil-O-Matic operates as an integral part of specially designed boilers and furnaces, reflect advanced engineering in a high heating efficiency. These boiler-burner and furnace-burner units are fully enclosed in smartly styled, colored jackets. On account of their compactness these units occupy very little floor space.

Boiler-burner units automatically provide domestic hot water supply the year 'round. Indirect heating coils may be included for either instantaneous or storage tank systems. Furnace-burner units provide winter air conditioning. Installation of these Oil-O-Matic boiler-burner and furnace-burner units is quick and simple. Write for detailed information.

Horizontal Boiler-Burner Unit

This unit is a complete Oil-O-Matic product, consisting of a boiler and Oil-O-Matic oil burner. It is furnished for both steam and hot water systems. The welded steel tank used meets A.S.M.E. code specifications for operating up to 15 lbs. pressure. It is completely covered with insulating material and jacketed. Proper bosses and tappings are provided for the various controls and piping connections, including an opening in the front of the tank for a domestic water heating coil. Boiler capacities are: 610 sq. ft. equivalent direct steam radiation; 980 sq. ft. equivalent direct hot water radiation.

Underwriters' Listing

Underwriters' Laboratories, Inc. list Oil-O-Matic to burn No. 3 fuel oil. Each burner carries the Underwriters' label. Also approved by all important codes and governing bodies.

Regulations governing oil burner installations are covered thoroughly in "Regulations of the National Board of Fire Underwriters for the Installation of Oil Burning Equipment and for the Storage and Use of Fuel Oils in Connection Therewith."

Fuel Oil Range Burners

Williams Oil-O-Matic fuel oil burner for use in conjunction with heavy duty ranges. All exclusive Oil-O-Matic features. Economical and efficient. Brings oil heat economy to restaurant, hotel, hospital, steamship, dining car, resort and club. The starting and stopping of the motor, the ignition, the varying of the amount of oil burned and of air delivery, are all controlled with one single lever. The Oil-O-Matic fuel oil range burner is furnished as an integral part of the Oil-O-Matic South Bend Heavy Duty Range.

Engineering Service

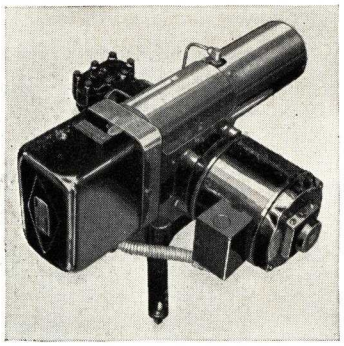
Available to architects. See A.I.A. File No. 30 G-1.

YORK OIL BURNER CO., INC.

Manufacturers of One of the Most Complete Lines of Domestic, Commercial and Industrial Oil Burning Equipment in the World

YORK, PA.

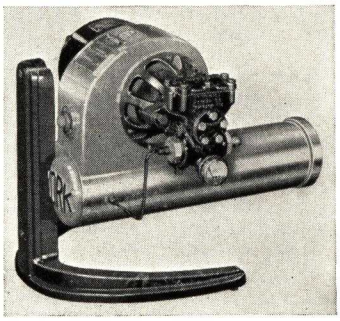
CONVERSION DOMESTIC OIL BURNERS, VERTICAL WATER HEATERS AND SPACE HEATERS



Model "F" Burner

A small York burner developed for small conversion jobs. It has a capacity range up to 500 square feet of steam radiation, burns as little as .7 gallon per hour with a maximum of 1.35 gallon per hour.

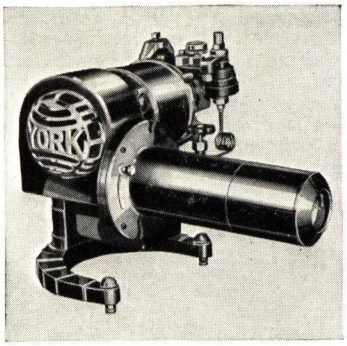
This is one of the most compact burners York has ever built and is ideally adaptable for the smallest installations.



Model "K" Burner

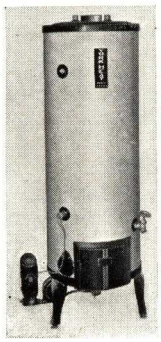
Medium sized York burner with flange type air adjustment on discharge side of the fan. It features simplicity of design, with all parts and accessories easily accessible. An efficient burner ideally adaptable for average installations.

This is one of the most popular of the less expensive York models.



Model "T" Burner

York's Deluxe conversion burner, the most popular and widely used of our models. Contains the famous Iris Shutter, which is positively exclusive and which makes it the most economical burner available. Motor, fan and pump assembly are *one unit*. Sizes run from 1200 to 9000 square feet of steam.

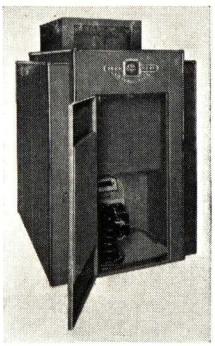


Water Heaters

Oil burning, vertical water heaters which are really dependable. Fired by special pot type burner with forced draft on high fire. Operates from oil pilot flame to high fire by automatic thermostatic and level control valve. For use with kerosene or No. 1 fuel oil.

Space Heaters

Deluxe Lo-Boy, an attractive and efficient oil burning space and circulating heater. It is a special console model containing two pot type burners. Contains concealed built-in tank and includes automatic thermostatic control and constant level valve. Available in other sizes and designs.



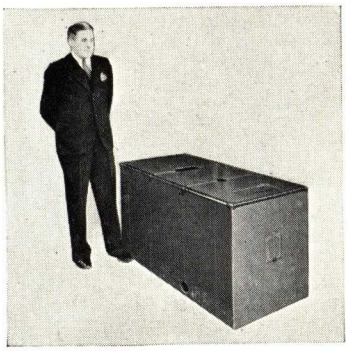
Gravity Warm Air Furnace

An oil burning warm air furnace of the gravity type. Ideal for replacement of old types of hot air systems and can be used with existing ducts or registers. It is very efficient and capable of fast heat delivery. This unit is built throughout of heavy riveted steel construction.

Industrial Burners Since 1897 ***Domestic Burners Since 1919***

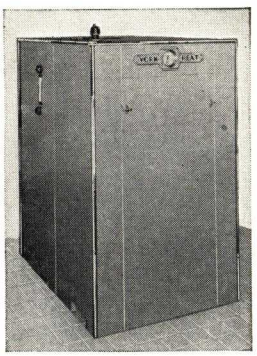
Literature and Technical Data submitted upon request

STEEL AND CAST IRON BOILER-BURNER UNITS, HIGH PRESSURE AND MARINE BOILERS, AIR CONDITIONERS



Miniature Boilers

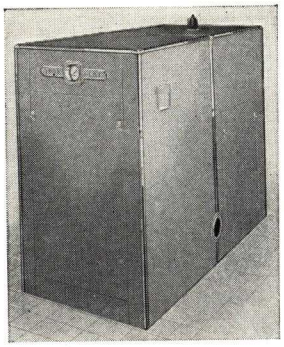
Small Junior size, all steel boiler-burner units. Of Scotch marine design with charcoal iron tubes. Sizes of 280 to 625 square feet steam; 450 to 1000 square feet of hot water. Ideal for heating small homes or supplying large quantities of domestic hot water in apartments, restaurants, etc. Tankless hot water.



Cast Iron Boilers

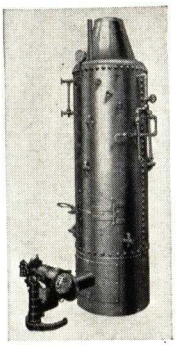
Two sizes of highly efficient cast iron boiler-burner units with capacities of 500 and 800 square feet of steam. Outstanding characteristics are low stack temperatures and economical operation.

A unique, exclusive design developing unusually high efficiencies.



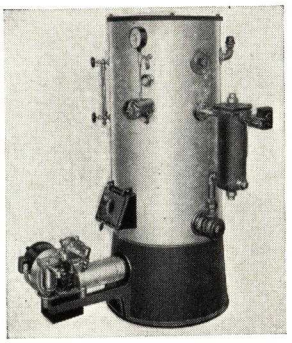
Horizontal Steel Boilers

Horizontal tubular, Deluxe boiler-burner units in capacities of 500 to 2000 square feet of steam. Combustion chamber completely surrounded by water. Instantaneous, tankless domestic hot water coil. Made of firebox steel with charcoal iron tubes. Noted for low operating costs.



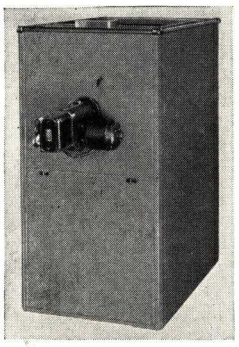
High Pressure Boilers

Built in intermediate sizes of from 3 to 20 horsepower. Vertical, steel, riveted boilers with burner combined, for operating at 100 pounds pressure or over, and manufactured to A. S. M. E. Standards. Furnished with special oil burning base, hand injector, vertical or cheese box hood.



Marine Boilers

Vertical steel boiler-burner units ideally adapted for Diesel marine use. Small floor space and little headroom is required. The unit burns Diesel oil, is not affected by the motions of a ship and operates on prevailing direct current.



Air Conditioners

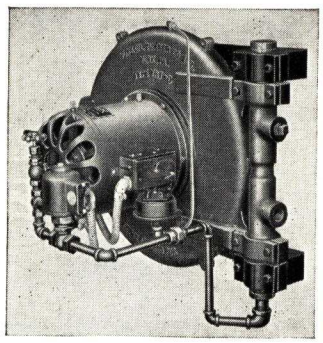
A series of new and revolutionary designed winter air conditioning units, which are small, neat and compact. The supply and return ducts leave and enter top of the unit, making an attractive installation. Smallest size has capacity of 100,000 B.t.u. at the bonnet.

Literature and Technical Data submitted upon request

YORK OIL BURNER CO., INC.

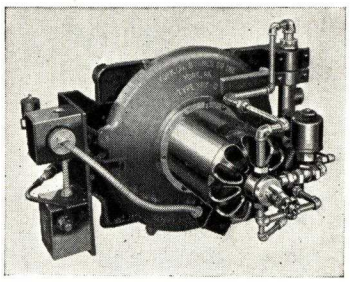
HORIZONTAL ROTARY OIL BURNERS FOR NOS. 5 AND 6 OIL

GRAVITY OR PUMP TYPE



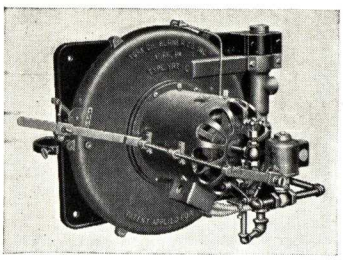
Model "G" Burner

This burner is of the gravity type and can be used on installations where manual control is desired and where a battery of burners are in use. This particular burner requires a separate pump set.



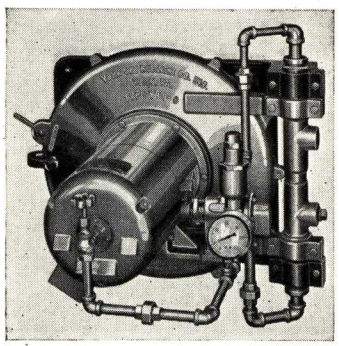
Model "AG" Burner

Type AG burners are the fully automatic type and require separate pump sets. They are designed to burn No. 5 and No. 6 oils and are approved by the Underwriters' Laboratories, Inc.



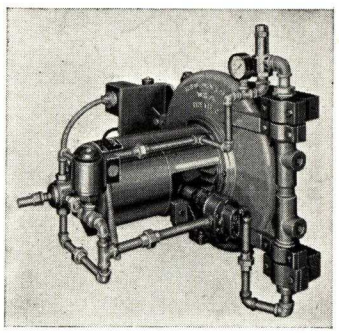
Model "LG" Burner

This burner is a gravity unit with high and low synchronizing air and oil controls. They can operate from low pressure damper regulation or high pressure steam controls. This burner requires a separate pump set and can be operated in a battery, if so desired.



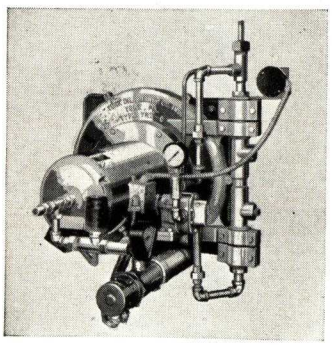
Model "P" Burner

This burner is complete unit, having the pump built in and requires no other means for supplying the oil. It is a manual controlled burner. It also can be equipped with high and low controls, if desired.



Model "AP" Burner

This burner is of the built-in pump type and is fully automatic. It is designed to burn No. 5 oil without preheating. Like all York burners, it can be had with the high and low controls to operate from boiler pressure.



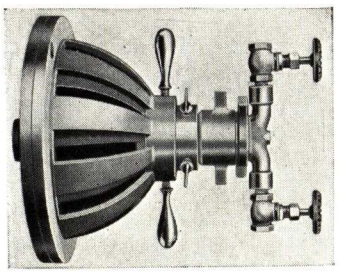
Model "AHP" Burner

This burner is of the same design as incorporated in the Type "AP", with the added feature of the electric preheating and circulating equipment for burning of No. 6 oil; also the high and low control equipment can be added.

Literature and Technical Data submitted upon request

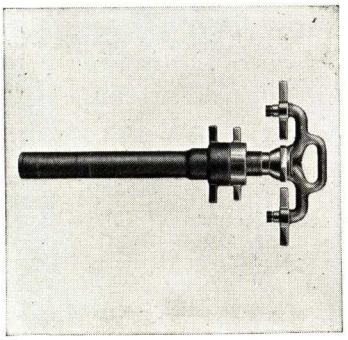
INDUSTRIAL OIL BURNING EQUIPMENT

VALVES—SHUTTERS—ACCESSORIES



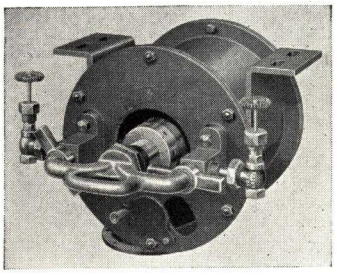
Model "J" Burner

This unit is a steam and oil atomizing burner with air register. It can be used on all types of boilers and industrial furnaces. It is designed to operate on low oil pressures, and is ideally adaptable for a great variety of purposes where inexpensive equipment is desired.



Model "S" Burner

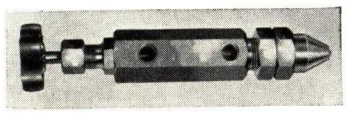
The York-Lalor Type "S" burner is a high pressure, mechanical atomizing type with low pressure steam. It is particularly used in large plants where constant loads are used. It can be had with separate motor and fans for induced draft for high ratings.



Model "D" Burner

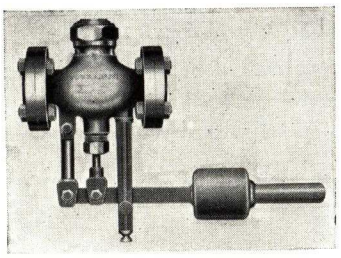
A burner, which was primarily made for glass tanks and installations where high heats are required, will handle from 50 to 125 qallons of oil per hour.

Adaptable for a variety of special processing work, smelting of metals, etc.



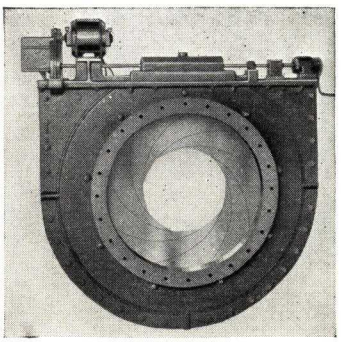
Model "F" Burner

A small burner and can be used where small quantity of oil is required, such as bake ovens, core ovens and small ovens. It can be operated from steam or air. A separate pumping set consisting of air compressor and oil pump mounted on a common plate can be furnished.



Valves, Etc.

York Automatic Shut-off Valve is designed for operation where fuel or air supply lines are in danger of breakage and require means of automatic control in the event of this interruption. Syphon breaking valves can be furnished in sizes from ½ to 6 inches.



Shutters

The York Variable Orifice or Iris Shutter is primarily an air and gas control. Its wide use on the air and gas lines of large industrial plants throughout the country has proven it to be a most accurate and positive means of such regulation. It is very sensitive and can be automatically or manually controlled.

Literature and Technical Data submitted upon request

AMERICAN AIR FILTER COMPANY, INC.

226 Central Avenue, LOUISVILLE, KY.

ENGINEERING AND SALES REPRESENTATIVES

ALBANY, N. Y.
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BARRE, VT.
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TACOMA, WASH.
TOLEDO, OHIO
TULSA, OKLA.
WASHINGTON, D. C.

CANADIAN ASSOCIATES, Darling Brothers, Ltd., MONTREAL, QUEBEC

PRODUCTS

The AMERICAN AIR FILTER COMPANY, INC., manufactures a complete line of AIR FILTERING EQUIPMENT, including Automatic Self-cleaning, Standard Unit and Dry Process Air Filters, all used for the removal of dust, dirt, bacteria and other foreign matters from the air.

This equipment is used for general ventilation, drying operations, process dust control; for air compressor and diesel engine; mill motor, turbo generator and other electrical applications; and for air or gas under pressure to remove entrained oil, moisture and dirt.

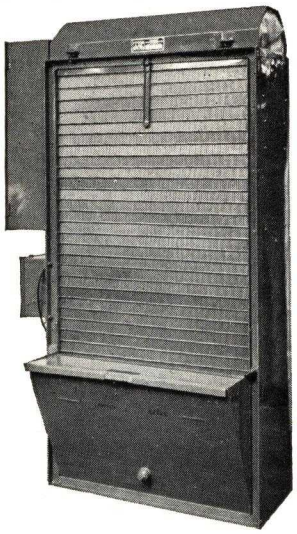
Guaranteed cleaning efficiency on any standard American Air Filter—97% to 98%, at a resistance of .25 to .385 in. w.g.

TECHNICAL FACILITIES

The Engineering and Research Staff of the AMERICAN AIR FILTER COMPANY, INC., includes practically every one of the individual engineers who developed and pioneered air filtration from an idea in 1920 to the position that it holds today of an essential requirement in modern ventilation and air conditioning. Recommendations made by the AMERICAN AIR FILTER COMPANY, INC., are therefore based upon the knowledge accumulated from years of intensive research and the experience gained from designing, building and applying thousands of air filters. Products bearing the "American" name are backed by ample technical and financial resources and may be relied upon as the most modern equipment in this field of service.

AUTOMATIC SELF-CLEANING AIR FILTERS

The American line of automatic air filters is among the most complete that has ever been offered. They have been proven in principle and performance by years of actual service in ventilation and industrial service. Positive self-cleaning assures maximum effectiveness and eliminates practically all maintenance.



THE NEW ARMORED MULTI-PANEL

Introducing an entirely new and unique panel construction to further improve the already outstanding performance of the multi-panel air filter. The new "armored" panel with its 3 stages of air cleaning maintains the present high efficiency and normal operating resistance of the multi-panel filter and offers the added advantage of handling excessive lint concentrations or heavy dust loads without clogging. Directly behind the armored panel is a multiplicity of closely overlapped Bakelite-fibre coated screen panels which form a continuous movable curtain.

When curtain enters changing liquid bath at base of filter, panels are automatically separated and individually cleaned thus insuring positive self-cleaning. Furnished for either continuous or intermittent service in sizes and setups suitable to desired capacity or space conditions.

Multi-panel is made in standard sections of 2 widths—No. 48, 4 ft. 1 in. wide, and No. 30, 2 ft. 7 in. wide, and in heights from 13 ft. x 6-in. increments. Write for bulletin No. 240-S.

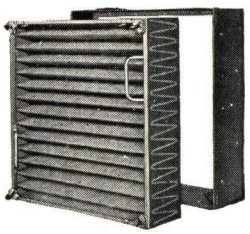
Phoenix and Horizontal Automatic Filters are also available.

UNIMATIC SELF-CLEANING FILTER

Furnished with either a hand crank or motor drive with push button control. For small or medium air capacities, fills the need for an intermediate filter between manually maintenanced units and the fully automatic Multi-panel. The Unimatic offers numerous advantages, one of which is the single pass curtain which makes possible for the first time the use of progressively packed media with its lower resistance and greater dust holding capacity.

AIRMAT P-L 24

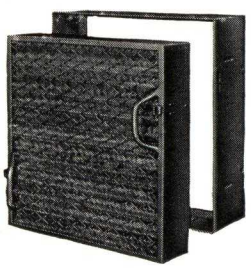
Presents Airmat filtering medium in convenient, compact unit form designed especially to meet the requirements of modern ventilating and air conditioning service. It requires no more space than a viscous filter of the same capacity and offers the high efficiency and simple, inexpensive maintenance of Airmat media. Uses the standard 6 or 10-ply Airmat paper (furnished in 225-ft. rolls) applied with either mechanical or manual loader. Airmat, with its low initial first cost, high resistance and large dust holding capacity will operate satisfactorily for a longer period of time and requires less frequent maintenance than any other type of dry filter.



AMERICAN UNIT FILTERS

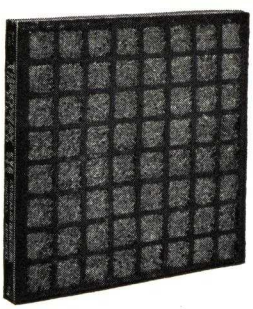
The American Unit Filter is made up of a standard sheet steel frame and interchangeable cell, with filter media of expanded metal or crimped wire, scientifically graded to produce maximum cleaning efficiency. Filters are arranged in wall type set-ups to deliver the required capacity and to meet space conditions. Automatic latches placed conveniently near handles of the cell permit instant and easy removal of the latter for cleaning and recharging.

Cleaning requires but a few minutes time and is usually accomplished by means of a steam or hot water tank.



Special Filters

American Air Filters, both "viscous" and "dry" are available in a wide variety of types to meet any specific air cleaning problem. Each type is made in several styles which differ in method of operation, servicing, space requirements, performance characteristics and initial cost.



"Throway" Furnace Filter with Cardboard Casing

Renu-Vent

A renewable type filter for ventilating or air conditioning service

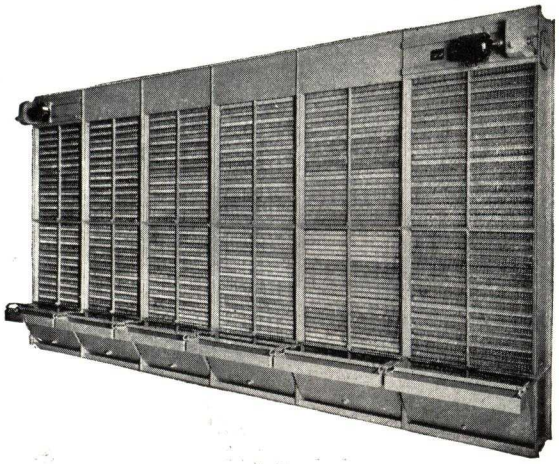
INDEPENDENT AIR FILTER CO.

Manufacturers of Air Cleaning Equipment

228 North La Salle Street, CHICAGO, ILLINOIS

REPRESENTATIVES IN PRINCIPAL CITIES

Air Cleaning Equipment for general and commercial ventilating and air conditioning systems. Advisory Engineering Service, without obligation, and technical information furnished on request.



"DOUBLE-DUTY"

An Automatic, Self-cleaning, Non-clogging Air Filter for Large Commercial and Building Installations

Simplicity of design, incorporating self-cleaning features and reinforced all-steel construction guarantees continued economy of operation and maintenance-free performance with positive uniformity of air flow.

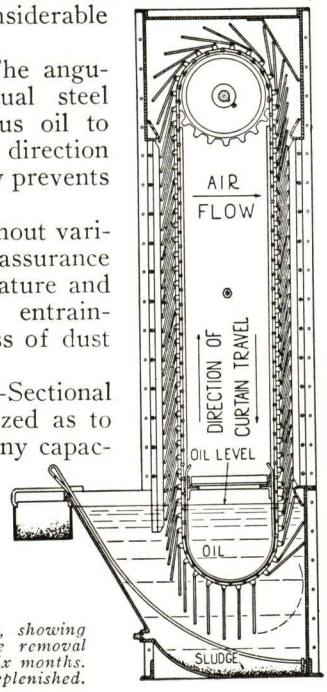
Basic Principle—Is that of true impingement on viscous coated surfaces. Perfect execution of this principle is carried out by acute air deflections against the rasp-like surfaces of the individual louvre baffle plates, which constitute the steel filter curtain.

Self-cleaning—Dust particles are freely and completely released and allowed to settle to the bottom of sludge tank when plates are immersed in the oil bath, remaining there for a considerable period.

No Oil Entrainment—The angular design of the individual steel louvre plates permits surplus oil to drain downward against the direction of air travel, which positively prevents oil entrainment.

Constant Air Flow—Without variation, this is a permanent assurance through the non-clogging feature and positive elimination of oil entrainment of this filter, regardless of dust content of the air.

Standard Construction—Sectional construction is so standardized as to permit easy installation of any capacity desired. Sections may also be conveniently added if future increase in capacity is decided upon.



Cross-section through filter, showing self-cleaning feature. Sludge removal necessary only every two to six months. Oil never changed, merely replenished.

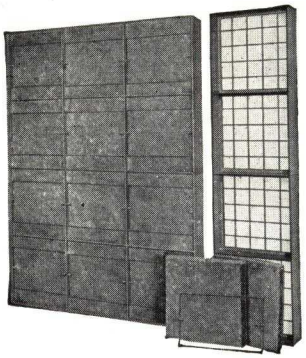
Servicing operation, illustrated above, consumes at the most 3 minutes per unit, including unloading, refilling and replacing. Life of filter medium varies from 3 to 6 months depending on dust content of air.

"KOMPAK"

A Low Velocity, Dry Fabric Air Filter, with Renewable Medium

The simplified design of the *"Kompak"* filter provides a definite solution to the problem of fabric filtration, affording maximum surface of filter medium within limitations of space available.

A dry fabric air filter with normal rating of 600 c.f.m. per unit. At this rating, velocity through the filter material is 22½ f.p.m. and initial resistance .15-in. w.g. Each filter unit contains 27 sq. ft. of fluffy filter-down fabric. Over-all dimensions per unit are 22 in. wide, 11 in. high and 15 in. deep. Low velocity through filter fabric results in low resistance and long useful life of filter medium. Frames are all-steel and thoroughly rustproofed.



"PERMO PAD"

For General Air Conditioning and Ventilating Installations

A fine textured, highly resilient filter, expanding firmly against the frame, providing a perfect seal against air leakage all around. "Permo Pad" is made self-supporting by a built-in metal grill in the center of the pad. Frame size (over-all dimensions) 20x20x6 in. Rated capacity per frame unit 800 c.f.m. Initial resistance (tandem arrangement) .18 w.g. Made in variety of sizes for warm air heating systems and air conditioning units.

WHITING CORPORATION

15618 Halsted Street, HARVEY, ILL.
(CHICAGO SUBURB)
REPRESENTATIVES IN ALL PRINCIPAL CITIES

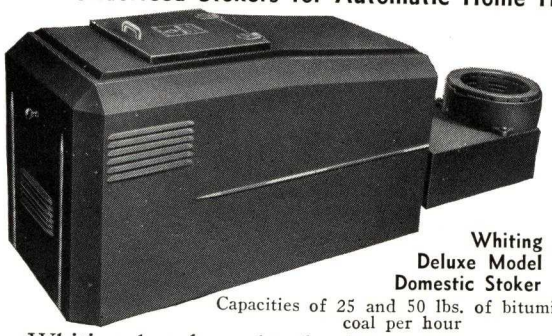
The Company

Now in its 53rd year, the WHITING CORPORATION has had 18 years' experience in the manufacture of solid fuel conveying and combustion equipment. Ample production facilities, well equipped laboratories, capable engineering staff, and comprehensive testing and inspection departments insure dependable products.

Products

A complete line of STOKER and PULVERIZING EQUIPMENT for firing boilers (up to 5000 hp.), including Underfeed Stokers for the smaller size boilers, Horizontal Compression Feed Stokers, Impact Pulverizers, Table Roller Pulverizers, Pulverized Coal Conveying and Feeding Equipment, Burners, etc.

Underfeed Stokers for Automatic Home Heat

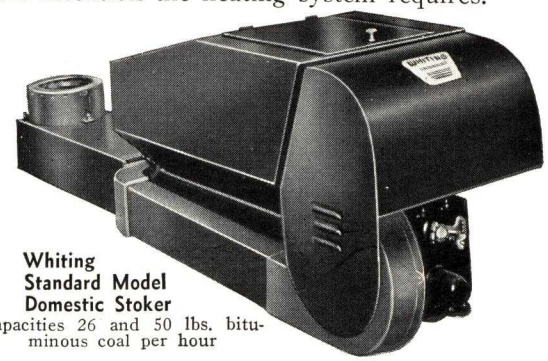


Whiting Deluxe Model Domestic Stoker
Capacities of 25 and 50 lbs. of bituminous coal per hour

Whiting has brought the luxury of automatic heat to the great mass of moderate-priced homes. The Whiting Stoker burns coal so efficiently that in many cases it actually reduces the cost of fully automatic heat below hand-firing.

It is the safest form of heat. Coal is not only cheaper to burn, but it cannot leak or explode. The Whiting burner is entirely enclosed. Children can play around it safely.

It is odorless. Smoke and fumes pass through the fire and are consumed. There are no ashes, only a small, clean clinker to be removed a few times per week. Filling the hopper once every day or two is all the attention the heating system requires.



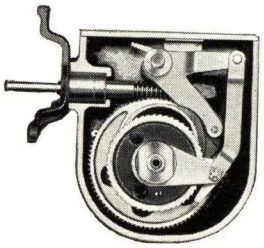
Whiting Standard Model Domestic Stoker
Capacities 26 and 50 lbs. bituminous coal per hour

Dual-Draft Burner

Designed with air ports on outside as well as inside. Fuel spreads out over burner and is entirely consumed. This permits efficient combustion of lower-priced bituminous coal. Non-clogging tuyeres prevent "freezing" of clinkers.

The Whiting Heat Control

Maintains constant pilot fire. Regulates and anticipates demands of thermostat so as to insure even, steady supply of heat, at any desired level, without wasting fuel. Whiting leads the way in co-ordinating action of coal feeding rate, air supply, frequency of pilot fire action, length of pilot operating time, and heat anticipation.

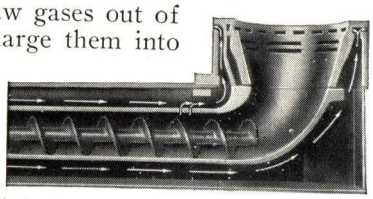


The Quiet 3-Speed Drive

Time-proved ratchet type transmission. No gears to shift — no pump or control valves to leak—and no springs to break. Oil is constantly circulating, yet never leaks. Coal feeding speed and air control quickly adjustable.

The Gas Eliminator

Its function is to draw gases out of the coal tube and discharge them into the firebox, where they are completely consumed. That is why the hopper of the Whiting Stoker does not need to be airtight.

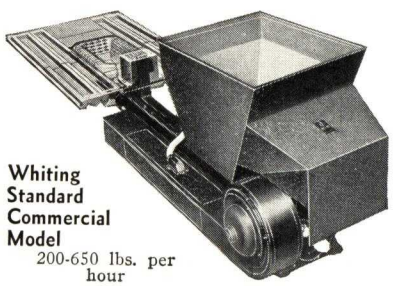


Underfeed Stokers for Commercial Use

Whiting Commercial Stokers—for either refractory or dead plate setting—range in capacity from 120 to 1250 lbs. of bituminous coal per hour. They are designed to fire all types of boilers—cast iron, locomotive, horizontal return tube, vertical, down-draft, and brick-set. Like the Domestic Models they are equipped with the Whiting Dual-Draft Burner, permitting the efficient combustion of low-priced grades of coal—the Gas Eliminator—and the Whiting 3-Speed Drive.

Horizontal Compression Feed Stokers

Designed for service in large industrial plants these stokers range in capacity from 300 to 1200 lbs. of bituminous coal per hour. They are suitable for steam boilers of practically all types, ranging from 50 to 300 hp. They burn practically all kinds of coal.



Whiting Standard Commercial Model
200-650 lbs. per hour

Engineering Data

Look in your telephone book for Whiting Branch or representatives, or address WHITING CORPORATION, 15618 Halsted Street, Harvey, Ill.

ESTABLISHED 1889

INCORPORATED 1917

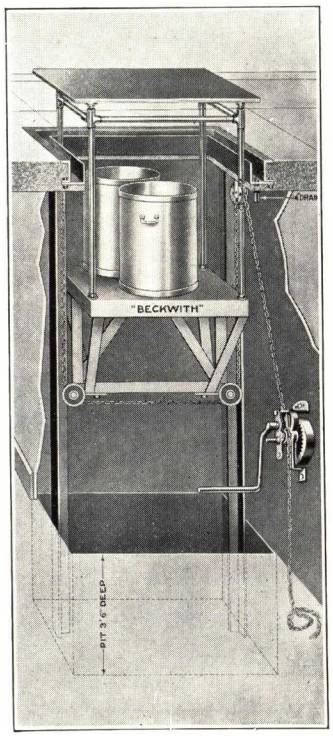
BECKWITH ELEVATOR CO., INC.

TELEPHONE
Liberty 8333

113 Albany Street, BOSTON, MASS.

For our page on Dumbwaiters see File Index

SIDEWALK ELEVATORS, LIFTS AND HOISTS—HAND—ELECTRIC—HYDRAULIC



Hand Power Sidewalk Elevator A-3

Chain hoist automatic brake machine with removable crank. Car opens flat or hinged cover. Simple—safe to operate. Low cost installation and upkeep

A-3: Hand-operated Sidewalk Lift, Underslung Type; Chain Hoist Automatic Brake Machine, Crank-operated

The car moves up or down as crank is turned. Car stops instantly when crank pressure is released.

Capacity .... lbs. Car size ....

Car made of ash well braced with matched hard pine floor. Metal guide shoes. Lift pulleys and brackets under bottom of car. Machine to be chain hoist automatic brake type fastened securely on sidewall or post. To have removable crank handle. Steel hoist chain. Two steel guide rails for sidewalls. Minimum depth of pit 18 in. for car to come flush with basement floor. Steel sidewalk cover with watertight frame and pipe standards or bow opener for lifting cover are extra.

A-6: Hand-operated Lift, Indirect Hoist

Band brake machine placed at front side of car. Turning wheel operates car. Speed and stopping controlled by brake lever and catch on machine. Car stops 15 in. above floor or pit line.

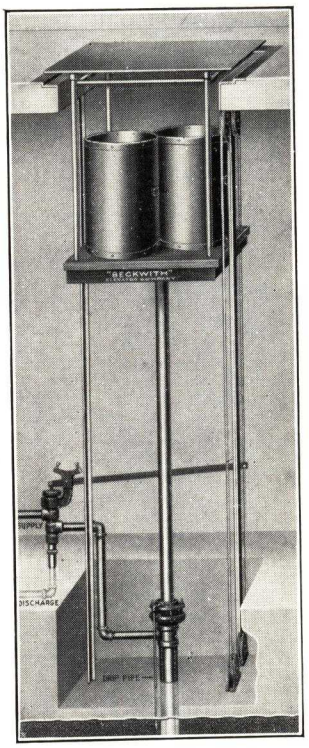
Capacity .... lbs. Car size ....

Car made of steel frame well-braced with matched hard pine floors. Metal guide shoes. Machine ball-bearing band brake type with hand-operated brake control lever and lock to hold car stationary. Machine to be located on floor at front side of car and connected to drum shaft by heavy sprocket chain. Two ⅜-in. steel hoist cables from drums to car platform. Two heavy steel guide rails to be fastened to side walls.

SIZES, CLEARANCES, CAPACITIES, ETC., OF PLATFORM LIFTS

No.		Car size, feet	Opening and shaftway sizes	Car capacity, lbs.	Speed, f.p.m.
A-3.	1	3x3	3′-8″ w. x 3′-3″ d.	500	.....
	2	4x4	4′-8″ w. x 3′-3″ d.	1000	.....
	3	5x5	5′-8″ w. x 5′-3″ d.	1500	.....
A-6.	1	3x3	3′-9″ w. x 3′-3″ d.	500	.....
	2	4x4	4′-9″ w. x 4′-3″ d.	1000	.....
	3	5x5	5′-9″ w. x 5′-3″ d.	1500	.....
A-11.	1	3x3	3′-8″ w. x 3′-3″ d.	500	20–50
	2	4x4	4′-8″ w. x 4′-3″ d.	1000	20–50
	3	5x5	5′-8″ w. x 5′-3″ d.	1500	20–50
A-10.	1	3x3	3′-10″ w. x 3′-3″ d.	500	20–30
	2	4x4	4′-10″ w. x 4′-3″ d.	1000	20–30
	3	5x5	5′-10″ w. x 5′-3″ d.	1500	20–30

Sizes, capacities, speeds, etc., will be changed to suit requirements.



Hydraulic Sidewalk Lift A-11

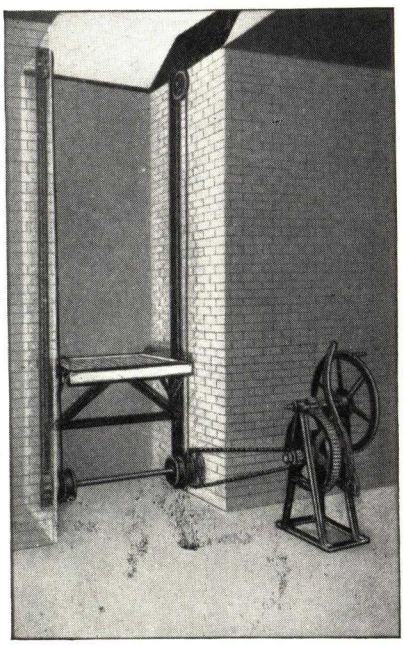
Cable control; automatic stops top and bottom. Flat or hinged cover opened by car

A-11: Hydraulic Lift

Used for all freight purposes either as shown, or inside building with standard freight type of car. Operates by slight pull on control cable. Automatic stops top and bottom. City water supply or pump pressure system of 40 lbs. or over is used for power. Cheap to operate and maintain, simple and very reliable.

Capacity .... lbs. Speed about 30 f.p.m. Water pressure .... lbs. Supply size .... Car size....

Standard steel car platform with maple floor, metal guide shoes. Steel or brass piston with 3-ring stuffing box, operating valve, cable, fastenings, sheaves, etc., including automatic terminal stops. Guide rails for car to be heavy planed steel. Supply and waste pipes to be galvanized or brass connected to valve and cylinder by plumber. Pipe standards for lifting cover (or bow opener for hinged cover as in A-10) extra. Checkered steel cover, one-piece or hinged, with watertight steel frame and ¾-in. drain pipe connection extra. Provide 3-ft. pit.



Hand Power Elevator A-6

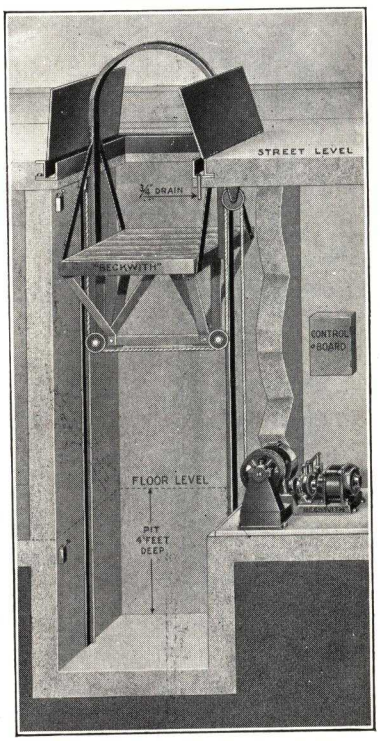
Machine located at front, either side of car

A-10: Electric Sidewalk Lift

Used for all freight purposes as shown, or inside of building with standard freight type of car. Operates by cable or push button in car or on wall. Full automatic or constant pressure control.

Advise electricity volts .... ph. .... cy .... Car size .... Capacity .... lbs. Speed .... f.p.m.

Car made of steel frame with maple floor underslung type, metal guide shoes. Machine to be drum type with high class elevator motor. Enclosed bronze gear, steel worm and ball-bearing thrusts, electric brake, machine limit and slack cable switch all mounted on a continuous bedplate and securely fastened to floor. Two steel hoist cables. Planed steel guide rails, hatchway car limit switches, push button stations, electric door contacts or gates to protect opening. Sheaves, hangers, dead-end for cables, etc. Bow opener on car (or pipe standards as in A-11) to open sidewalk doors, extra. *Checkered steel cover hinged or one-piece with watertight steel frame and ¾-in. drain pipe connection, extra. Provide pit 3 ft. or more deep.*



Electric Sidewalk Elevator A-10

Push button, constant pressure or automatic control. Automatic terminal stops

CAPITAL ELEVATOR & MANUFACTURING CO.

Manufacturers of Electric and Hand Operated Ash Handling Equipment

Town and Lucas Streets, COLUMBUS, OHIO

BRANCH OFFICES

AKRON, 864 Berghoff St. SANDUSKY, 109 W. Water St. ZANESVILLE, 134 Main St.

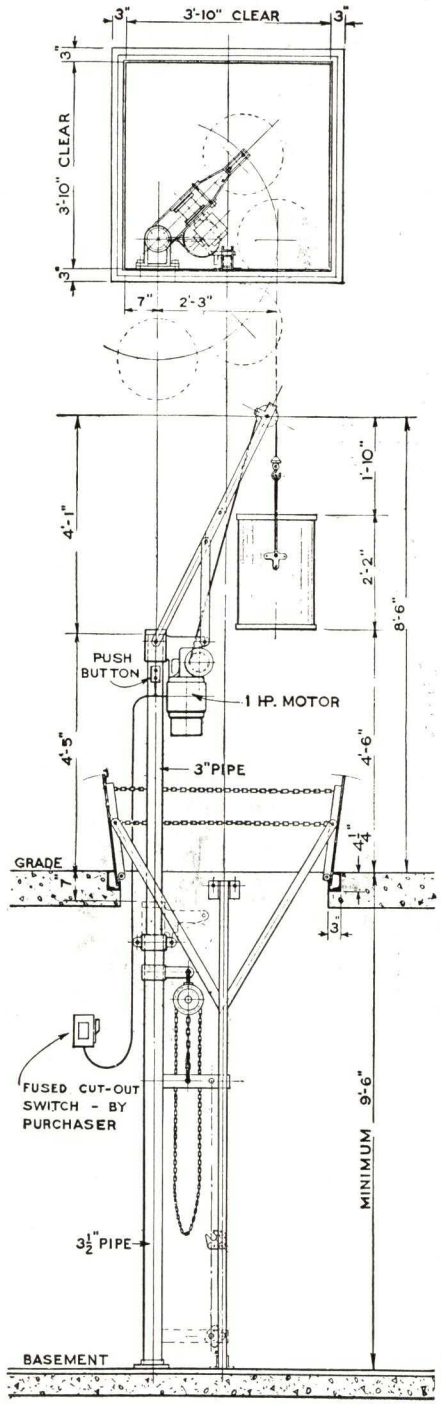
REPRESENTATIVES

CINCINNATI, OHIO, Central Building Products Co., 626 Broadway
DETROIT, MICH., Square Deal Elevator Co., 320 Beaubien St.
LANSING, MICH., Jas. E. Payne, 410 W. Saginaw St.
LOUISVILLE, KY., Champion Wire & Iron Works
NEW YORK, N. Y., A. W. Berghoefer, 122 E. 42nd St.
PORTSMOUTH, OHIO, Earl C. Hayes & Co., Box 908
RICHMOND, VA., R. E. Edmister, R. R. No. 6
ROCHESTER, N. Y., Alvin V. Light, 371 Hurstbourne Rd.
SUPERIOR, WIS., F. E. Johnson, 709 E. 8th St.

For our pages on Electrically and Hand Operated Elevators, Sidewalk Lifts and Dumbwaiters, see File Index

CAPITAL ELECTRIC ASH HOIST—MODEL 19C

Compact—Dependable—Durable



Doors open and close automatically with motion of hoist head.
Doors automatically locked when closed.
Automatic brake.
Roller bearing hoist head easily swung to position.
Capacity 300 lbs. at 50 f.p.m.
Crane for raising cans to truck height.

Note: In ordering or for quotations, please give distance from sidewalk level to basement floor and nature of electric current available for power.

Hoist—Motor is totally enclosed, high torque hoist motor, conservatively rated, designed for rugged service.

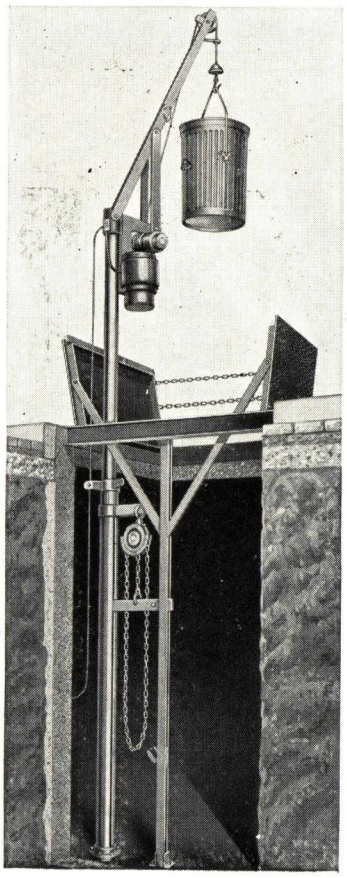
Gearing is of the worm gear type, hobbed in alloy steel, totally enclosed and runs in oil bath.

Drum is of deep flanged construction and so mounted in the frame as to give large clearance for rope.

Shafts and bearings—Steel shafts are of liberal size and are mounted in anti-friction bearings.

Brake—The automatic brake is of rugged construction, capable of holding full rated load in any desired position.

Control—The push button control is enclosed and protected. It has easily renewable finger tips, ample electrical clearance, complete accessibility and the hoist stops when the pressure on the button is released. A limit switch insures against overtravel in the up direction.



Hoist Head—Hoist head is an iron casting in one piece with machined spots for mounting hoist and revolves around the top of the mast on roller bearings, requiring very little effort to swing to the various positions.

Mast—The mast is in two parts, one telescoping into the other. It is of heavy steel tubing, straight and true and is easily raised and lowered by a standard spur geared, ball bearing, chain hoist. When in the up position, the upper section rests on a heavy steel pin through the lower section. This pin is attached to the mast by a chain so as to be always available.

A folding crane arm is provided for raising can to truck height, easily and quickly folded into position.

Doors—The cover doors are of the double leaf type, made of diamond steel plates, properly reinforced to withstand a load of 300 lbs. per sq. ft.

Frames are of heavy channel and angle construction with welded joints and provided with deep condensation gutter, tapped in two places for plumber's drain pipes.

Hinges are of the flush type with heavy bronze cast bases and steel pins, so mounted as to be easily renewable.

The operating arms are of flat steel bars, linked together, traveling in rigid guides, and are automatically locked in the down position.

Note: Standard size doors are 4x4 ft. over the plates, leaving a clear opening in the frame of 3 ft. 10 in. x 3 ft. 10 in. but may be made, for any reasonable opening at slight additional expense. Plumber's drain pipes are not furnished by us due to uncertainty as to location of basement drain.

HAND POWER MAST TYPE CAN LIFTS—MODELS 18 AND 11

Model 18 (Disappearing Folding Mast Type)

Built as part of a flush type sidewalk door with hoist, frame and door shipped assembled, ready to cement in place. All erection expense is thus virtually eliminated.

The operator opens balanced doors, unfolds the mast into place and readily raises our No. 2 heavy galvanized corrugated swing bail ash cans 18 in. in diam. by 26 in. high, filled.

Winch has ball bearings with cut gears, has ratchet for holding load and gear shift and brake for lowering empties. Rugged and easily operated.

Made in one size only. No engineering data required unless basement depth exceeds 15 ft. when extra cable will be furnished. Standard size sidewalk doors 3 ft. x 4 ft.

Model 11 (Revolving Mast Type)

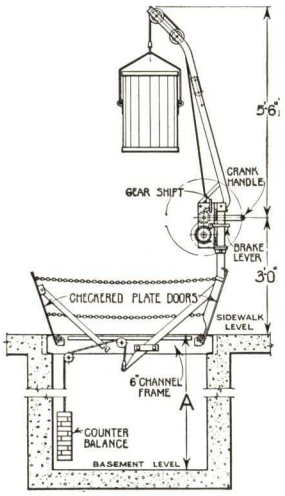
Self-supporting self-contained crane type ash lift, operated from basement (may also be arranged to operate from sidewalk).

Winch same as on Model 18. Takes our No. 2 can.

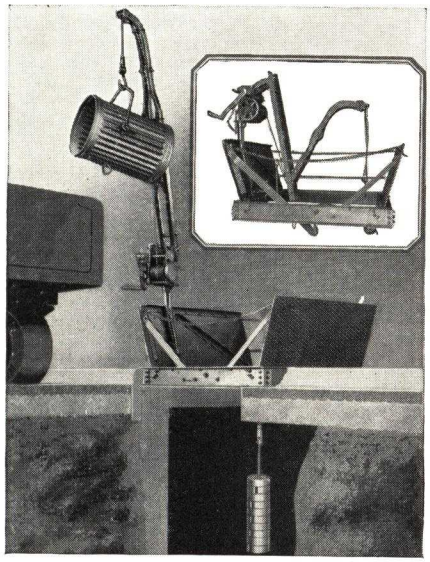
May be used with sidewalk rings or in areaways or inside of walls, to swing through opening.

May also be arranged to operate electrically with basement hoist.

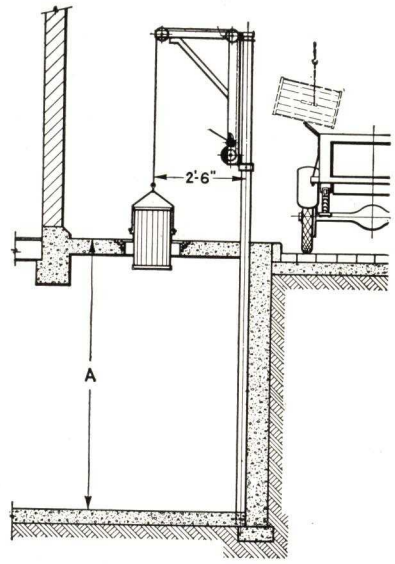
For quotations, give basement depth "A."



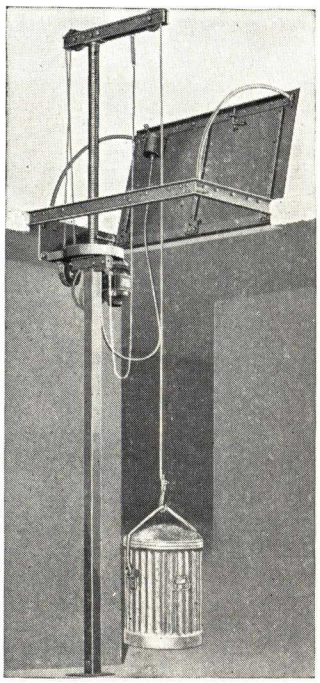
Side View



Model 18 Disappearing Folding Mast Can Lift



Model 11
Mast Type Revolving Can Lift



Model 19
Disappearing Screw
Mast Can Lift

An inexpensive power driven outfit for schools, stores, apartments, hospitals, etc.

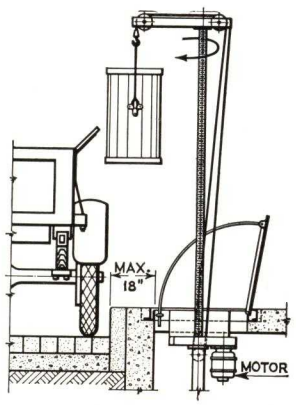
ELECTRIC DISAPPEARING MAST CAN LIFT—MODEL 19

This model is an inexpensive power driven outfit for the limited amount of ashes from schools, stores, apartments, hospitals, etc., for delivery from basement up through sidewalk door to truck. Its ⅓ hp. motor operates from a light or power circuit. Lifts a filled can of about 165 lb. at approximately 35 ft. per minute. Fits basements 7 to 17 ft. deep. From grade level to bucket hook, 7 ft.

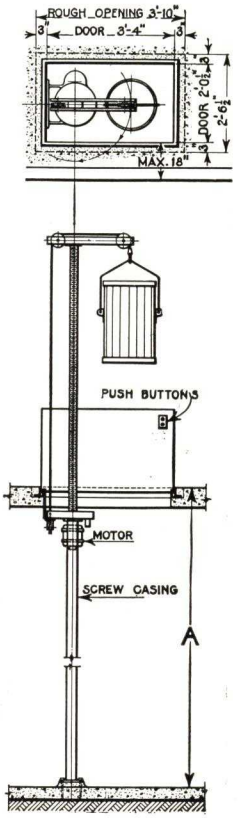
Its screw mast travels through the hub of a motor driven gear, as the bucket raises and lowers. Thus, by arrangement of ropes, the bucket is raised from the basement to truck while the screw travels above grade level.

Operation—Open sidewalk door; use "Up" and "Down" switch placed there for full control of lift. Automatic switches fix limits of travel.

Ordering—In making inquiry, give basement depth "A" and electric current available.



Cans Readily Swing to Trucks



CHARLES K. ERNST, INC.

Originators and Manufacturers of Sidewalk Elevators and Ash Hoists

998-1006 East Ferry Street, BUFFALO, N. Y.

AGENTS IN PRINCIPAL CITIES

Products

TELESCOPIC HOISTS with and without overhead cranes, hand and electric, non-telescopic and basement window.

PLATFORM SIDEWALK LIFTS, hand and electric.

CELLAR WINDOW single can, and PLATFORM handling 4 or more cans at a time.

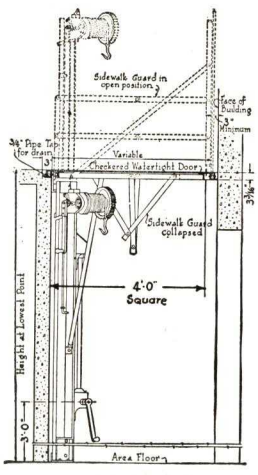
SAFETY-GUARDED ONE-PIECE and TWO-LEAF SIDEWALK DOORS; SPRING GUARD GATES.

LADDERS; ASHCAN TRUCKS, ASHCANS; DOOR OPERATING DEVICE, BELL RINGING ALARMS.

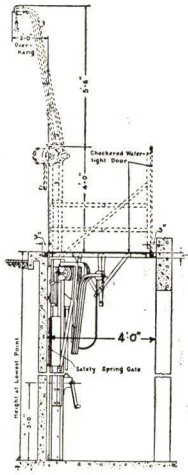
Ernst Sidewalk Doors

No better sidewalk doors made, they embody one-piece frames, with watertight concealed frame and gutter, tapped for ¾-in. pipe drain, having cast steel hinges of concealed type easily replaceable, checkered steel tops reinforced to carry load of 300 lbs. per sq. ft., having automatic guards on single leaf door, having nothing to stumble or slip on in wet and icy weather. They are widely used with and without our elevators and ashlifts, and more than outlast two average doors, giving excellent appearance as well as long-live. Frames made of a one-piece 3x3x¼-in. angle and can be furnished for all sizes of door openings.

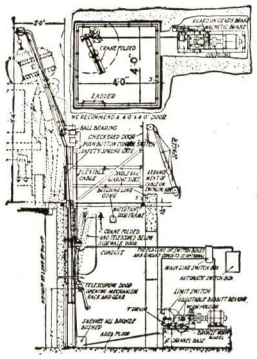
Model	Recommended for	Specifications
Model "1" Hand operated Telescopic 500 lbs.—35 ft. per min. One-man operated. *(Non-telescopic and Window Crane Lifts can also be furnished)*	For buildings where from 5 to 10 cans are hoisted daily to sidewalk. Cellars up to 20 ft.	Furnish and install, where shown on plans, one Ernst Type "1" Telescopic Hoist, having gear shift and brake device with ball bearing winch. To be complete with a 4x4-ft. Ernst safety guarded one-piece door with supertight door frame, with Ernst door operating device with spring guard gate. Also 12 Ernst swing bail cans 18x26 in., one hand truck, ladder and bell alarm all for one-man operation. Outfit guaranteed one year against any defects.
Model "2" Hand operated Telescopic 300 lbs.—35 ft. per min.	For small volume of ashes—from 5 to 10 cans daily—to dump cans directly into truck or wagon. One-man operated.	Furnish and install one Ernst Type "2" Telescopic Hoist with overhead crane—to hoist cans to truck height. With gear shift, brake, ball bearing winch. Complete, with one Ernst one-piece safety guarded door with door operating device with spring guard gate. Also 12 swing bail ash cans, one hand truck, bell alarm, ladders for complete one-man operation.
Model "3" Electric operated Telescopic Motor in basement 500 lbs.—60 ft. per min.	Two-man operated. For large amount of ashes to be hoisted directly on to truck level.	Furnish and install, where shown on plans, one Ernst Type "3" Electric Telescopic Hoist with or without overhead crane, with worm gear drive, push-button control, reversing wall switch motor on stand in basement; with upper slower limit switches, solenoid brake, complete with one Ernst 4x4-ft. safety guarded door, with door operating device. Also 12 Ernst swing bail ash cans, one hand truck, ladder and spring guard gate.
Models "3A" and "3B" Electric operated Telescopic Motor on top of mast. Push-button, one-man controlled. These models not shown below 500 lbs.—60 ft. per min.	For electric operation, one-man operated. For hoisting cans to grade level. (Model "3B" to elevate cans for truck 300 lbs. capacity—60 ft. per min.) Send factors for drawing.	Furnish and install, where shown on plans, one Ernst "3A" Electric Telescopic Hoist to grade level. To wagon height, specify Model "3B." Complete with worm gear drive, upper limit switch with magnetic brake and reversing switch; complete with one Ernst one-piece safety guarded door with watertight frame and automatic door operating device. Also 12 swing bail ash cans, one ladder, truck and bell alarm for one-man operation. Models "3A" and "3B" have motor mounted on top of Telescopic Arm, eliminating winch in basement.
Model "4" 25 ft. per min. Electric operated platform elevator. Push-button control, fully automatic. 1000, 1500 and 2000 lbs. capacities.	For hoisting 4 to 6 ash cans at a time. Ideal for handling materials down to basement, 1000 lbs. capacity. Has double endless chain drive and numerous other advantages.	This lift, inclined but 2 ft. 5 in. from a vertical elevator, takes up considerable less space due to motor being built and attached between uprights. It has a double endless chain drive with roller bearing platform. We believe this the finest sidewalk or window elevator made today. It is worm gear driven—with solenoid brake, upper and lower hatchway limit switches and two 3-way push-button stations. Operates entirely automatic. A 4x4-ft. platform requires a door opening 4 ft. 2 in. wide, 5 ft. long. Eliminates all cable troubles.
Model "5" Hand operated platform sidewalk lift. Eliminates an outside cellar areaway, if installed at window. 12 ft. per min.	Handpower Elevator. One of the finest platform lifts made. Can be installed in sidewalk area or at cellar window. Eliminates cable drums and expensive repairs.	**Window Model**—If installed at a cellar window, it eliminates the expense of an outside areaway and if window is raised high enough ash cans can be emptied directly on to truck. No platform elevator, we believe, can approach this model for ease and speed of operation. Requires practically no upkeep expense—due to absence of cables. Platform is counterbalanced and operated from side; runs on roller bearings. Takes up no space for winch. Platform raises when empty without cranking, winch requires cranking only when lifting load.
Model "8" An electric operated vertical Sidewalk Elevator made in 500 to 2000 lbs. capacity. 15-25 ft. per min.	For boiler rooms—also stores. For handling general merchandise to and from the basement.	Made entirely of metal. Has heavy steel pipe guides on which platform sleeves ride sleeves cradle and support the platform on cable sheaves. Winch mechanism is extended in basement. Operates entirely automatic by push-button stations, upper and lower hatchway limit switches and solenoid brake. Platform has a heavy steel plate welded to 2x2½-in. angle iron frame. Motor, 2-3 hp., operates worm gear drive noiselessly. Pit 18 in. deep.
Model "9" Same as model "8." Hand operated. 500, 750, 1000 and 1500 lbs. capacities. 14 ft. per min.	Identical to Model "8" with exception of hand operating winch. Ideal for handling ashes as well as merchandise to and from basement.	One of the fastest and easiest operating sidewalk elevators made. Constructed entirely of metal, including platform. Made in any size platform up to 30 sq. ft. Stock size 4x4-ft. platform requires door opening 4 ft. 2 in. x 4 ft. 9 in. Can be furnished with two-leaf sidewalk door with bow on car. Bell alarm. For new or old buildings; very easy to install.



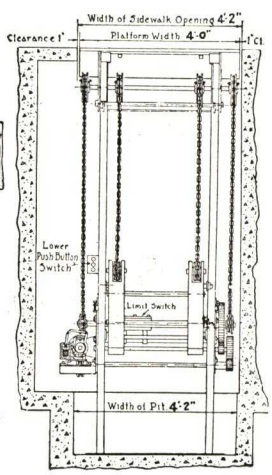
Model "1"



Model "2"

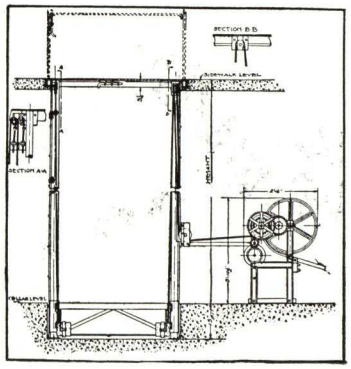


Model "3"



Model "4"

Complete details and large drawings of any model will be sent to Architects and Engineers on request.



Model "9"

ESTABLISHED 1866

G&G HOIST CORPORATION

SUCCESSORS TO GILLIS & GEOGHEGAN, INC.

TELEPHONE
BArclay 7-3560

11 Park Place, NEW YORK, N. Y.

FACTORY: 98 Snediker Avenue, BROOKLYN, N. Y.

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BIRMINGHAM, ALA., James R. Adams Co., 2717 Sixth Ave. So. (4-3640)
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DES MOINES, IOWA, Hawkeye Engineering Co., Hubbell Bldg. (4-1429)
DETROIT, MICH., O. H. Dawson, 172 Farrand Ave. (Townsend 7-6975)
ELMIRA, N. Y., H. N. Forbes, 405 W. Clinton St. (6416)
EVANSVILLE, IND., A. G. Schlamp, 116 Herndon Drive (3-1480)
FORT WAYNE, IND., Jones & Moss, 215 Standard Bldg. (A-9488)
GRAND RAPIDS, MICH., T. K. Bender, 200 Ionia Ave., N. W. (8-1173)
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INDIANAPOLIS, IND., Stackhouse Building Specialties, Inc., 6117 College Ave. (Humboldt 4767)
JACKSON, MISS., Fred Thrasher, Tower Building (2521)
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NASHVILLE, TENN., John Williams Co., 1207 Warner Bldg. (6-7688)
NEW HAVEN, CONN., H. Dumelin & Sons, 295 Sherman Ave. (5-6495)
NORFOLK, VA., J. S. Jones, 350 Arcade Bldg. (2-1456)
OKLAHOMA CITY, OKLA., Federal Supply Co., 120 E. Main St. (2-9031)
OMAHA, NEB., Kraus & Trustin, 636 Paxton Block (Atlantic 8561)
PITTSBURGH, PA., James R. Pitcairn, Century Bldg. (Atlantic 8790)
PHILADELPHIA, PA., Chas. Clement, 401 No. Broad St. (Walnut 3741)
PORTLAND, ORE., Cress & Co., 2143 No. Pettygrove St. (Atwater 9648)
READING, PA., Harry Oxenreider, 522 Court St. (Reading 2-4101)
RICHMOND, VA., J. S. Archer, Atlantic Life Bldg. (3-5712)
ROANOKE, VA., Roanoke Eng. Sales Co., State & City Bank Bldg. (2-2298)
ROCHESTER, N. Y., S. A. Spencer, 135 Spring St. (Main 6406)
SAN FRANCISCO, CAL., Vincent Whitney Co., 130 10th St. (Hemlock 4641)
SCRANTON, PA., LaBar & Evans, 711 Linden St. (9134)
SEATTLE, WASH., F. T. Crowe Corp., 216 Walker Bldg. (Main 7950)
ST. LOUIS, MO., Hunkins Willis Lime & Cement Co., Taylor and Duncan Ave (Franklin 2701)
SYRACUSE, N. Y., B. R. Johnson, 145 Harding Place (9-2733)
TOLEDO, OHIO, S. L. Everitt, 619 Edison Bldg. (Main 5526)
UTICA, N. Y., American Hard Wall Plaster Co. (2-4156)

IMPORTANT NOTICE

G&G Hoist Corporation have purchased and are the sole owners of all the patent rights to telescopic hoists, and patent rights to ash-hoist equipment, formerly held by Gillis & Geoghegan, Inc.; the trade mark, G&G Telescopic Hoist; all books and records of the ash-hoist business conducted formerly by Gillis & Geoghegan, Inc., together with all patterns and blue prints; and is the successor to Gillis & Geoghegan, Inc., in the production and manufacture of the G&G Telescopic Hoist and all G&G ash-hoist equipment.

G&G ANTI-FRICTION BEARING MANUAL TELESCOPIC HOISTS

All G&G Hoists are now made with *all* shafts revolving in *anti-friction bearings,* further assuring (1) *ease of operation,* (2) *dependability,* and (3) *long wear,* all of which have been outstanding features of G&G Hoists even before this noteworthy improvement was adopted.

the G&G Telescopic Hoist with Automatic Gear Shifting Brake Device and Silencer

MODEL A

Anti-friction Bearing Manual Type Hoist

For raising maximum loads of 500 lbs. at a speed of 30 f.p.m. from Basement to Grade Level

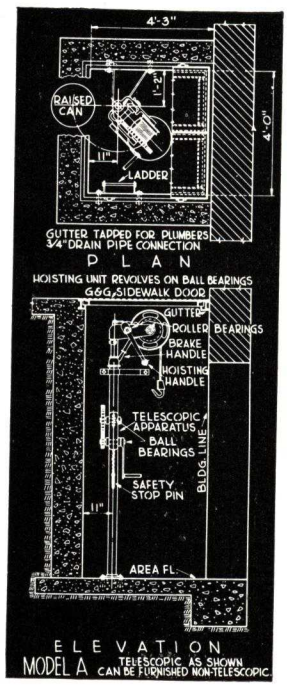
One man, unaided, performs the entire operation with a pressure of only 7 lbs. applied to the Hoisting Handle for each 100 lbs. of load to be raised. Empty cans are lowered to basement by gravity. The Hoisting Handle does not revolve when hoist is used for lowering. Automatic Silencer assures quiet operation at all times.

How to Specify Model A—

Furnish and install, where indicated on plans and in accordance with manufacturer's drawings and instructions, ONE MODEL A TELESCOPIC MANUAL HOIST, with all shafts revolving in anti-friction bearings and with Automatic Gear Shifting, Brake, Silencer and Gravity Lowering Device, all as manufactured by G&G HOIST CORPORATION, New York, N. Y.

Include the following G&G Equipment (*) with the hoist, and set same in a proper manner, all as shown on manufacturer's drawings: Flush Watertight Doors; Automatic Sidewalk Door Opening-Closing and Locking Device with Automatic Safety Spring Guard Gates; Electric Warning Gong; Fixed Bail Ash Cans; Rubber-tired Ash Can Truck, and Heavy Engineer's Ladder.

(*) *For G&G Hoisting Cans and Other Equipment, see pages* 4 *and* 5



PATENTS ISSUED

United States			*Canada*	
Apr. 30, 1912	Feb. 1, 1916	Apr. 24, 1923	Apr. 19, 1912	May 9, 1916	May 30, 1922
May 19, 1914	Mar. 7, 1916	Jan. 6, 1925	May 14, 1912	July 25, 1916	Nov. 28, 1922
June 23, 1914	Mar. 28, 1916	Jan. 6, 1925	Dec. 9, 1913	Sept. 5, 1916	Apr. 24, 1923
(June 30, 1914)	Mar. 13, 1917	Feb. 3, 1925	(Apr. 7, 1914)	Oct. 10, 1916	Jan. 12, 1925
(Reissued)	Oct. 8, 1918	Feb. 9, 1925	(Reissued)	Nov. 21, 1916	Apr. 14, 1925
(Oct. 19, 1915)	Mar. 9, 1920	Feb. 17, 1925	(Nov. 14, 1916)	June 1, 1920	Apr. 14, 1925
Aug. 17, 1915	Mar. 9, 1921	Oct. 27, 1925	Apr. 27, 1915	Aug. 31, 1920	June 30, 1925
Dec. 7, 1915	Mar. 9, 1922	Nov. 10, 1925	June 22, 1915	May 9, 1922	July 7, 1925
Dec. 7, 1915	Sept. 19, 1922	Feb. 9, 1926	Aug. 3, 1915	May 30, 1922	Mar. 2, 1926

G&G ANTI-FRICTION BEARING MANUAL TELESCOPIC HOISTS

G&G Anti-friction Bearing Telescopic Hoists are designed for quick, safe, dependable, economical raising and lowering of loads under 1000 lbs. between floors, or from basement to grade level.

The hoists are compact, occupy small space and are ruggedly constructed throughout so that no part has a factor of safety of less than eight, based on the ultimate strength of the material when the maximum load for which the hoist is designed is raised.

The new *anti-friction bearings* used on *all* revolving shafts, assure easy operation and long life, with a minimum of attention. While standard G&G Anti-friction Bearing Telescopic Hoists will meet the requirements of most buildings, where unusual or difficult conditions are encountered, we will be glad to work with architects and others in the design and construction of a hoist that will exactly meet all conditions.

MODEL B

Anti-friction Bearing Manual Type Overhead Crane Hoist

For raising maximum loads of 500 lbs. at a speed of 30 f.p.m. from Basement to a position of 6 ft. above Grade Level—dumping cans directly into truck without rehandling at grade

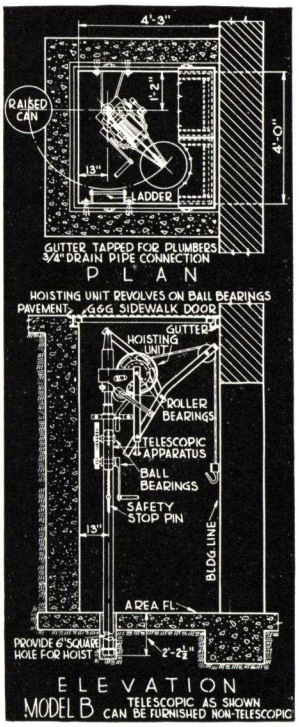
One man, unaided, performs the entire operation with a pressure of only 7 lbs. applied to the Hoisting Handle for each 100 lbs. of load to be raised. Empty cans are lowered to basement by gravity. Hoisting Handle does not revolve when hoist is used for lowering. The new counter-weighted collapsible boom is easily and quickly placed into working position with a minimum amount of effort and without danger to the operator. Because of the great savings in time and labor provided by the Model B Overhead Crane Hoist, we recommend that architects plan, wherever possible, to locate sidewalk openings near the curb or driveway, to permit the adoption of this model.

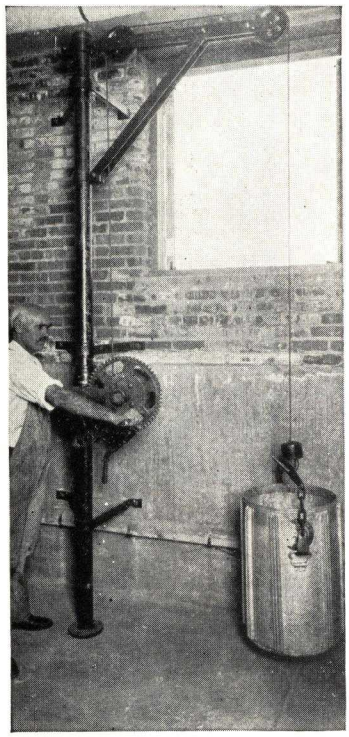
How to Specify Model B—

Furnish and install where indicated on plans and in accordance with the manufacturer's drawings and instructions, ONE G&G MODEL B TELESCOPIC MANUAL OVERHEAD CRANE HOIST, with *all* shafts revolving in anti-friction bearings, and with counter-weighted collapsible boom, Automatic Gear Shifting, Brake, Silencer and Gravity Lowering Device, as manufactured by G&G HOIST CORPORATION, New York, N. Y.

Note: Include G&G Equipment as specified for Model A on the preceding page, substituting "Swing Bail" for "Fixed Bail" Ash Cans.

(For description of G&G Hoisting Cans and Other Equipment, see pages 4 and 5)





MODEL BW

Anti-friction Bearing Manual Type Hoist

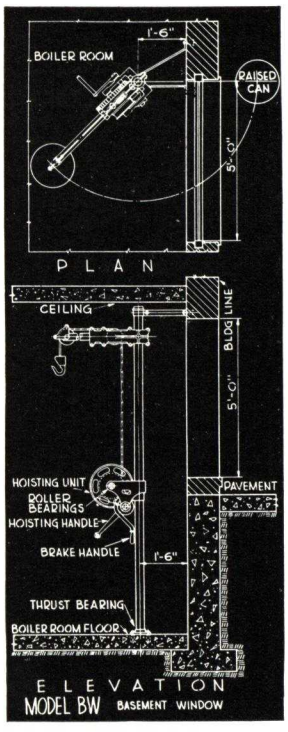
For raising maximum loads of 500 lbs. at a speed of 30 f.p.m. Loads can be raised and swung through a window or doorway

A pressure of only 7 lbs. applied to the Hoisting Handle for each 100 lbs. to be raised is required. Empty cans are lowered to boiler-room floor by gravity. The Hoisting Handle does not revolve when the hoist is used for lowering. Automatic Silencer assures quiet operation.

How to Specify Model BW—

Furnish and install where indicated on plans and in accordance with the manufacturer's drawings and instructions, ONE G&G MODEL BW MANUAL HOIST with *all* shafts revolving in anti-friction bearings, and with Automatic Gear Shifting, Brake, Silencer and Gravity Lowering Device and Fixed Bail Ash Cans, as manufactured by G&G HOIST CORPORATION, New York, N. Y.

(For description of G&G Hoisting Cans and Other Equipment, see pages 4 and 5)



For G&G Anti-friction Bearing, Electric Telescopic Hoist, see following page

G&G ANTI-FRICTION BEARING ELECTRIC TELESCOPIC HOISTS

G&G Electric Hoists should be specified wherever a large quantity of ashes must be handled quickly, where the area is deep, or both. G&G Electric Hoists have been installed in schools, apartments, hospitals, theatres, industrial and public buildings of all types throughout the United States, Canada and foreign countries, and are recognized for their dependability, durability and economy.

The G&G Electric Exclusively Telescopic Hoist With Automatic Stop and Gravity Lowering Device

Today, the cost of operation has been further reduced and efficiency increased by the *anti-friction* bearings used with *all* revolving shafts which assure lower current consumption, together with smoother operation and trouble-free performance.

MODEL E

Anti-friction Bearing Electric Type Hoist With Motor Located on Hoisting Head

For raising maximum loads of 500 lbs. at a speed of 60 f.p.m. from Basement to Grade Level

Empty cans are lowered quickly to basement by gravity. One man, unaided, performs the entire operation. Current is consumed only when hoisting. The Hoist is operated by a 1½ hp. a-c. or d-c. motor, equipped with Magnetic Brake, Gravity Lowering Device, Automatic Upper Limit and Single Speed controller. All gears and bearings operate in a bath of lubricant in a sealed housing.

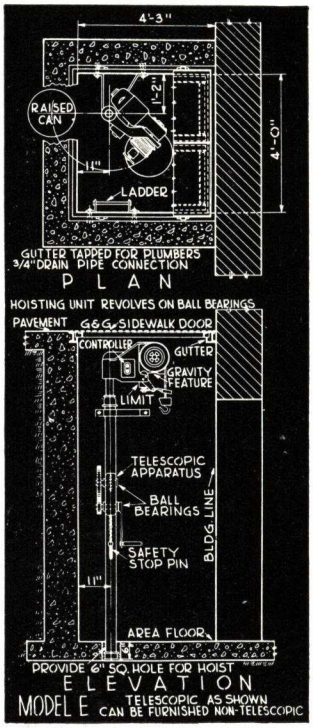
How to Specify Model E—

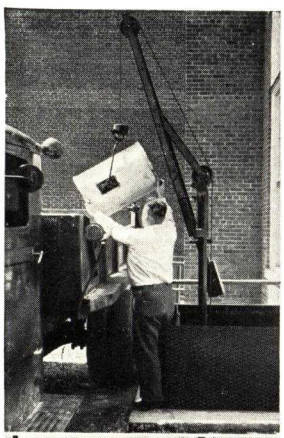
Furnish and install, where indicated on plans and in accordance with the manufacturer's drawings and instructions, ONE G&G MODEL E TELESCOPIC ELECTRIC HOIST, with *all* shafts revolving in anti-friction bearings, and with Automatic Upper Limit and Gravity Lowering Device, as manufactured by G&G HOIST CORPORATION, New York, N. Y.

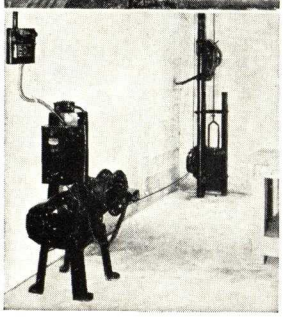
Include the following G&G Equipment (*) with the hoist and set same in a proper manner, all as shown on manufacturer's drawings: Flush Watertight Doors; Automatic Sidewalk Door Opening-Closing and Locking Device with Automatic Safety Spring Guard Gates; Electric Warning Gong with transformer (*See note*); Fixed Bail Ash Cans; Rubber-tired Ash Can Truck, and Heavy Engineer's Ladder.

Note: Electrical wiring, from service line to outlets on hoist motor and to transformer of warning gong, shall be provided by the electrical contractor.

(*) *For description of G&G Hoisting Cans and Other Equipment, see pages 4 and 5*







MODEL D

Anti-friction Bearing Electric Type Overhead Crane Hoist With Motor Located in Basement

For raising maximum loads of 500 lbs. at a speed of 60 f.p.m. from Basement to a position 6 ft. above Grade Level dumping cans directly into truck without rehandling at Grade

Model D is popular where many cans must be handled quickly. The hoist is operated by a 1½ hp., totally enclosed a-c. or d-c. motor, equipped with Magnetic Brake, Automatic Upper Limit and Single Speed Controller. All gears and bearings operate in a bath of lubricant in a sealed housing. This hoist is also equipped with the new counter-weighted collapsible boom which is easily and quickly placed into working position with a minimum amount of effort and without danger to operator.

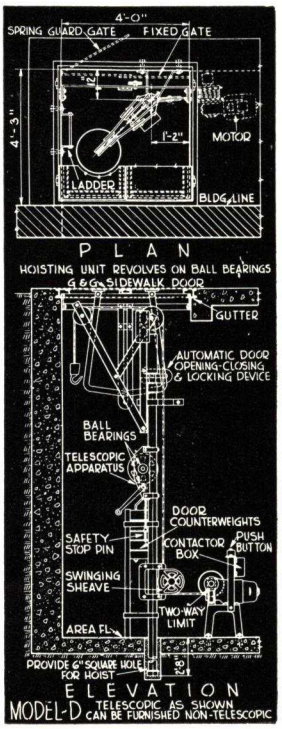
How to Specify Model D—

Furnish and install, where indicated on plans and in accordance with the manufacturer's drawings and instructions, ONE G&G MODEL D HOIST, with *all* shafts revolving in anti-friction bearings, and with counter-weighted collapsible boom, Magnetic Brake, Automatic Upper and Lower Limit and Single Speed Controller, as manufactured by G&G HOIST CORPORATION, New York, N. Y.

Include the following G&G Equipment (*) with the hoist and set same in a proper manner, all as shown on manufacturer's drawings: Flush Watertight Doors; Automatic Sidewalk Door Opening-Closing and Locking Device with Automatic Safety Spring Guard Gates; Electric Warning Gong with transformer (*see note*); Swing Bail Ash Cans; Rubber-tired Ash Can Truck, and Heavy Engineer's Ladder.

Note: Electrical wiring, from service line to outlets on hoist motor and to transformer of warning gong, shall be provided by the electrical contractor.

(*) *For description of G&G Hoisting Cans and Other Equipment, see pages 4 and 5*



G&G ANTI-FRICTION BEARING ELECTRIC TELESCOPIC HOISTS

MODEL D3

Anti-friction Bearing Electric Type Overhead Crane Hoist with Motor Located on Hoisting Head

For raising maximum loads of 500 lbs. at a speed of 60 f.p.m. from Basement to a position of 6 ft. above Grade Level, dumping directly into truck without rehandling at Grade

Model D3 is designed for conditions where lift is of moderate height and where few quick trips are to be made at one time. One man performs the entire operation. The hoist is operated with a 1½ hp., totally enclosed a-c. or d-c. motor, equipped with Magnetic Brake, Automatic Upper Limit and Single Speed Controller. All gears and bearings operate in a bath of lubricant in a sealed housing. This hoist is also equipped with the new counter-weighted collapsible boom which is easily and quickly placed into working position with a minimum amount of effort and without danger to the operator.

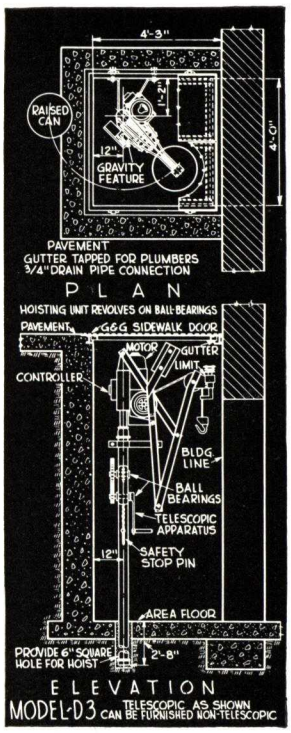
How to Specify Model D3—

Furnish and install, where indicated on plans and in accordance with the manufacturer's drawings and instructions, ONE G&G MODEL D3 TELESCOPIC OVERHEAD CRANE ELECTRIC HOIST, with *all* shafts revolving in anti-friction bearings, and with counter-weighted collapsible boom, as manufactured by G&G HOIST CORPORATION, New York, N. Y.

Note: Include G&G Equipment as specified for Model D on page 3.

Note: Electrical wiring, from service line to outlets on hoist motor and to transformer of warning gong, shall be provided by the electrical contractor.

(For G&G Hoisting Cans and Other Equipment, see below and page 5)



G&G IMPROVED HOISTING CANS

Description

G&G Improved Hoisting Cans are made in our own factory especially for use with G&G Hoists. They are constructed throughout of 16-gauge galvanized and copperized sheet steel, reinforced at top and bottom with 1¼ x ¼-in. steel bands. The thickness and weight of the 16-gauge sheet steel (*very much heavier than the material ordinarily used for ash cans*) results in greater strength, ruggedness and durability. The "swing bail" can is *balanced*—the can is easily tilted for emptying yet it will not spill ashes while being raised. The swing bail is so arranged that it will not drag on the floor when the can is being handled in the cellar and it remains stationary for easy hooking and raising. These cans are particularly recommended for their labor-saving features.

Types of G&G Improved Hoisting Cans

Fig. A: G&G Standard 16-gauge 17x24 in. Side Handle Hoisting Can—Where the convenience of the fixed bail feature is not desired, this can will be found very useful for general purposes and will outlast several ordinary cans. *Weight*: 42 lbs.

Fig. B: G&G Standard 16-gauge 17x24 in. Fixed Bail Hoisting Can—Recommended for use with Models A, BW and E because it is easy to hook preparatory to raising. *Weight*: 42 lbs.

Fig. C: G&G Standard 16-gauge 17x24 in. Swing Bail Hoisting Can—Recommended for use with Models B, D and D3. Swing Bail remains stationary for hooking preparatory to raising. *Weight*: 45 lbs.

Fig. A **Fig. B** **Fig. C**

G&G FLUSH WATERTIGHT SIDEWALK DOORS

Standard Sidewalk Door

The door rests perfectly flush with the sidewalk in every detail of its construction. This checkered steel door is designed to sustain a live load of 300 lbs. per sq. ft.—insuring against deflection.

G&G Sidewalk Doors are watertight—a condensation gutter, tapped for plumber's drain connection, provides a perfectly dry area. All corners are welded. Hinges are flush, of cast bronze with monel metal hinge pins which are easily removed without breaking surrounding concrete.

Extra Heavy Sidewalk Door

Wherever the ash truck or other heavily-loaded vehicles pass over the door, we recommend that G&G Extra Heavy Flush Watertight Sidewalk Doors, which are designed to sustain a live load of 1200 lbs. per sq. ft., be specified. The frame is constructed of 5-in. I-beams. The leaves are of ⅜-in. diamond plate steel, reinforced with six 3-in. I-beams, spaced approximately 8 in. on center. Extra heavy hinges are of cast bronze, with ½ in. diameter monel metal hinge pins. Angle iron gutters, 4x3x¼ in., are tapped at two points for plumber's drain connection.

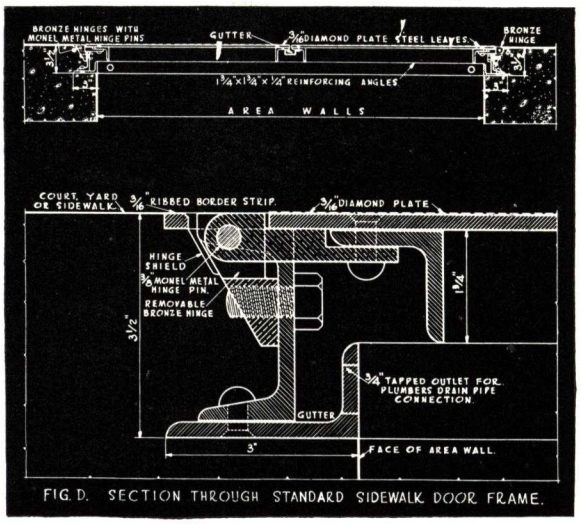


FIG. D. SECTION THROUGH STANDARD SIDEWALK DOOR FRAME.

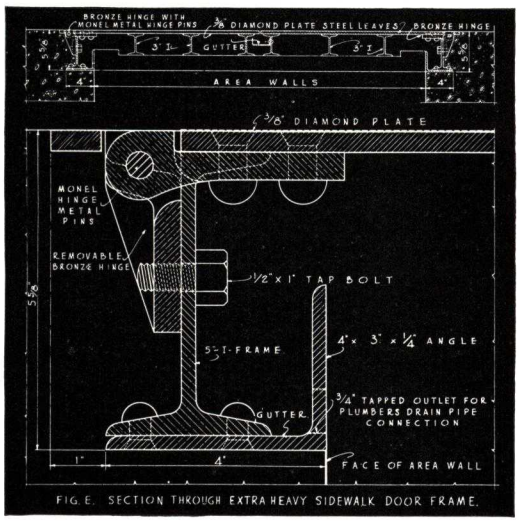


FIG. E. SECTION THROUGH EXTRA HEAVY SIDEWALK DOOR FRAME.

OTHER G&G EQUIPMENT

Safety Spring Guard Gates

(Illustrated in connection with Models A, E, and D)

These gates meet all municipal sidewalk regulations. They automatically close up the space at the sidewalk level between the open doors. Swing gate does not swing *inward*—swings *outward only* to permit passage of can or other load, thus protecting both pedestrians and operator.

Automatic Sidewalk Door Opening-Closing and Locking Device

(Illustrated in connection with Models A, E and D)

Can be used with all G&G Hoists (except Model BW). Sidewalk doors open and close as the hoisting head is raised or telescoped. A counter-weight is provided so that the telescoping handle works smoothly and easily. An important feature is the automatic *self-locking* of the doors, whether opened or closed.

Ash Can Truck

A convenient one-handled truck which greatly facilitates handling of the cans. Furnished with rubber wheels. Saves time and labor and prevents wear and tear on the cans.

G&G Anti-friction Worm Gear Telescopic Device

For the raising and lowering of G&G Hoists to and from working position. Eliminates opening in area floor, thus overcoming waterproofing and hydrostatic pressure problems. By providing the following area depths, the extension of the hoist into area floor can be eliminated.

Models A and E—(*Grade Level Delivery of Cans*): Spur Gear telescopic device, minimum area depth, 7 ft., 9 in. Worm Gear telescopic device, minimum area depth, 7 ft. 6 in.

Models B, D and D3—(*Truck Height Delivery of Cans*): Spur Gear telescopic device, opening in area floor necessary irrespective of area depth.

Worm Gear telescopic device, minimum area depth, 10 ft., 10 in.

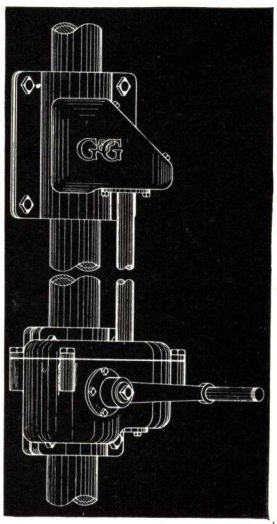


Fig. F: Anti-friction Worm Gear Telescopic Device
Eliminates piercing of area floor.

Electric Warning Gong

Sometimes required by municipal regulations to warn those on the sidewalk. The G&G Electric Warning Gong complies with all such regulations.

Engineer's Ladder

G&G Ladders, located in the hoistway, provide quick and direct access from basement to grade and return.

Shop Test

All G&G Hoists and Equipment are subjected to a thorough working test before shipment.

Instructions

Complete instructions for erecting and installing hoists are furnished with each shipment together with complete maintenance instructions.

POTTS ASH HOIST CORPORATION

GENERAL SALES OFFICE AND FACTORY

MECHANICSBURG, CUMBERLAND COUNTY, PA.

SALES AGENCIES IN THE UNITED STATES

ALABAMA: BIRMINGHAM—Charles M. McCrum, 2015 5th Avenue N.
ARKANSAS: LITTLE ROCK—Clippard Builders Supply Co., 419 Center Street
CALIFORNIA: LOS ANGELES—Frank R. Peck Co., Inc., 420 So. San Pedro Street
COLORADO: DENVER—The George P. Heinz Co., 812 Twelfth Street
CONNECTICUT: NEW HAVEN—The Warner-Miller Co., Railroad Avenue
DISTRICT OF COLUMBIA: WASHINGTON—Arthur R. Myers, 410 Bond Building
FLORIDA: JACKSONVILLE—Peter G. Ward, Atlantic National Bank Building
GEORGIA: ATLANTA—Hill R. Huffman, Bona Allen Building
ILLINOIS: CHICAGO—Jones and Sell, 1546 Conway Building
INDIANA: FORT WAYNE—C. L. Schust Roofing Co., Taylor & Lake Erie Ry.
INDIANAPOLIS, Hoover Brothers, 604 Majestic Building
IOWA: DES MOINES—Preston Daniels, 322 Securities Building
KENTUCKY: LOUISVILLE—Kentucky Metal Products Co., Preston Street and Audubon Park
MARYLAND: BALTIMORE—Charles A. Garies, 1417 Carswell Street
MASSACHUSETTS: BOSTON—J. G. Waxman Company, 72 Granite Street
MICHIGAN: DETROIT—Walter M. Rodgers, 4456 Cass Avenue
GRAND RAPIDS—Haven-Busch Company, 501 Front Avenue, N. W.
MINNESOTA: MINNEAPOLIS—Arthur D. Hale, 121 W. Rustic Lodge Avenue
MISSOURI: KANSAS CITY—Robert O. Smith, 2035 E. 19th Street
ST. LOUIS—George A. Caine, Chemical Building
NEBRASKA: OMAHA—The G. H. Alwine Company, Brandeis Theater Building
NEW YORK: ALBANY—Engineering Service Corporation
NEW YORK—Potts Ash Hoist Corporation, 19 Rector Street
ROCHESTER—F. H. Fredman Company, 507 Cox Building
SYRACUSE—Waterman Building Specialties, 1407 Erie Boulevard, E.
NORTH CAROLINA: GREENSBORO—The Carolina Steel & Iron Company
OHIO: CINCINNATI—A. W. Frank Company, Times-Star Tower
CLEVELAND—The Queisser Builders Supply Co., 9105 Woodland Avenue
TOLEDO—Jos. P. Kessler & Co., P. O. Box 83, Station A
PENNSYLVANIA: ALTOONA—Altoona Pipe & Supply Co., 2111 Beale Avenue
ERIE—George H. Kraft & Son, 602 Schenley Drive
PHILADELPHIA—Culbert-Whitby Co., Inc., 2019 Rittenhouse Street
PITTSBURGH—Keystone Sales Co., P. O. Box 4201, Bellevue Station
SCRANTON—Harvey R. Allen, 711 Linden Street
TENNESSEE: MEMPHIS—Akers & Company, 202 Falls Building
UTAH: SALT LAKE CITY—Hawley-Richardson-Williams Co., 204 Dooly Building
WEST VIRGINIA: CHARLESTON—Fireproof Products Co., 214 Professional Building
WHEELING—David Tyler, 28th and Chapline Streets
WISCONSIN: MILWAUKEE—Warden-Allen Co., P. O. Box 2057

MANUFACTURERS OF IMPROVED ELECTRIC AND HAND-POWERED TELESCOPIC HOISTS FOR THE REMOVAL OF ASHES, RUBBISH AND GARBAGE—AND SIDEWALK ELEVATORS TO HANDLE MISCELLANEOUS FREIGHT

TELESCOPIC POTTS ASH HOIST

Potts *Hoists* are made for rugged wear. Castings are of first quality steel. They are guaranteed work- and weather-proof. All gears have cut teeth and working parts are machined with precision.

The Potts *Manufacturing Company* plant, at Mechanicsburg, Pa., has been making the highest grade of building equipment, since 1887, including ornamental iron work and sidewalk doors, and ash hoists sold under another distributor's name. Potts quality is time-tested. It has been long and favorably known in all parts of the country.

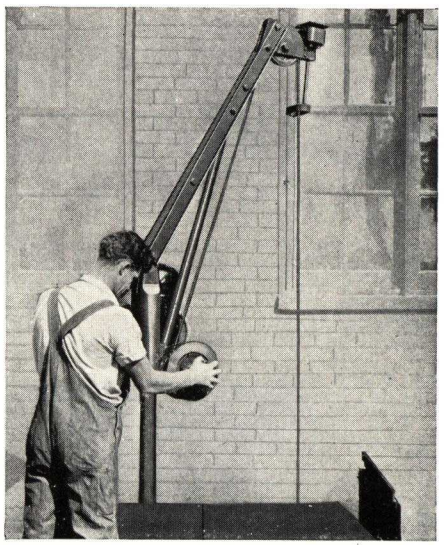
New Electrically Operated Hoisting Head

The Potts *Model E Hoist,* without any sacrifice in quality, has been designed to bring an electrically operated telescopic ash hoist within the price range of a hand-powered one, thus making it possible to secure the labor-saving and efficiency of an electric hoist at little more than the price of a hand-powered model.

The *Model E* and *Model D-3* hoists are equipped with every known feature to insure safety and efficiency of operation: Special mechanism to permit lowering by gravity, automatic upper limit, magnetic brake, push button control, 1½ horsepower motor. They are designed for a maximum working capacity of 500 pounds, with a hoisting speed of 60 feet per minute.

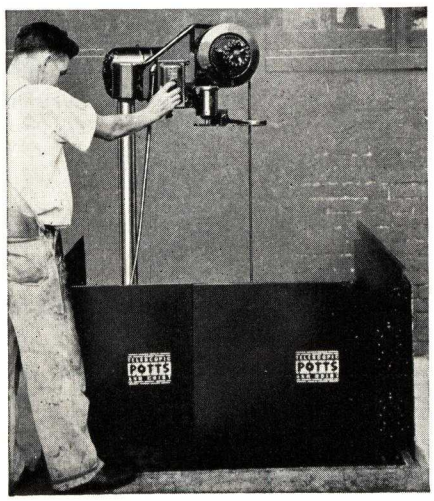
How to Specify—Furnish and install where shown on plans, and in accordance with manufacturer's details, one Potts electrically operated *Model E* telescopic hoist, grade level type, having maximum working capacity of 500 pounds, with hoisting speed of 60 feet per minute, and designed to lower by gravity as manufactured by the Potts Ash Hoist Corporation of Mechanicsburg, Pa.

For specification of complete installation, including Sidewalk Doors, etc., see page 4.



Overhead Crane Hoist

Model D-3, at right, with overhead crane to facilitate dumping directly into ash trucks, and Model B (see Page 2) are recommended where hoistway openings are near curbs or driveways



Newest Electric Model

Electric Models, such as Model E, at left and Model D-3, above, have push button control for raising and stopping the load. A special mechanism permits lowering by gravity and cuts electric power consumption in half. A magnetic brake and safety upper limit automatically stop movement of motor and load when current is interrupted or limit of upper travel is reached

Overhead Crane Simplifies Ash Removal

The *Model D-3,* electrically operated, has an overhead crane to facilitate the dumping of loaded ash cans directly into ash trucks. It is designed for installation in hoistways located in driveways or adjacent to curb lines. Using the *Model D-3,* and Potts *Swing Bail Ash Cans,* it is possible for one man to raise the cans above grade level and dump them into waiting trucks, merely by tipping the bottom of the cans. The operator does not have to leave the grade level. See illustration of hand-powered *Model B* on page 2.

How to Specify—Furnish and install, where shown on plans, and in accordance with manufacturer's details, one POTTS electrically operated Model D-3 telescopic, overhead crane hoist, truck dumping type, having maximum working capacity of 500 pounds, with hoisting speed of 60 feet per minute, and designed to lower by gravity as manufactured by POTTS ASH HOIST CORPORATION of Mechanicsburg, Pa.

For specification of complete installation, including Sidewalk Doors, etc., see second page following.

Hoists with Motor Units in Basement

Model C hoist is equipped with a horizontal crane, designed to raise cans to grade or sidewalk level.

Model D hoist is equipped with truck-dumping facilities similar to Models B and D-3. (See cut on page 3.)

Features of Models C and D

Power Unit—Consists of 1½ horsepower motor with integral worm-gear reducing unit mounted on base, located in basement.

Control—Either drum-type or push button, located at basement or sidewalk level. Other features, such as automatic upper limit, magnetic brake, etc., are standard on these models. *Models C and D* are designed for electric raising and lowering and are recommended for installation where conditions necessitate the employment of more than one man for the removal of ashes. Complete specifications sent on request.

Reliable and Efficient Hand-powered Model

The POTTS *Model A,* hand-powered, hoist must deserve popularity through its efficient service and the ruggedness of its construction.

Its use is recommended where costs do not permit, and conditions do not require, the installation of electric equipment.

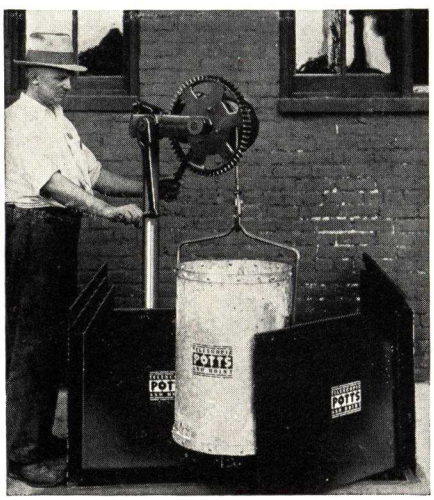
The *Model A* will safely and easily raise loads of 500 pounds at a speed of 30 feet per minute and lower them by gravity at any desired speed, controlled by a specially designed hand brake with heavily woven lining.

The hoisting handle does not revolve during lowering, thus insuring speed of operation and additional safety for operator.

Model A hoist is noiseless, due to special silencing mechanism.

How to Specify—Furnish and install where shown on plans, and in accordance with manufacturer's details, one POTTS hand-powered *Model A* telescopic hoist, grade level type, having maximum working capacity of 500 pounds with hoisting speed of 30 feet per minute as manufactured by the POTTS ASH HOIST CORPORATION of Mechanicsburg, Pa.

For specification of complete installation, including Sidewalk Doors, etc., see following page.



Potts Hand-powered Type

Automatic safety spring guard gates swing outward to permit cans to be placed on sidewalk, but completely enclose hoistway opening. Operator of hand-powered Model **A,** at left shows how POTTS Hoisting Units revolve, on ball bearing plates, to deposit cans on sidewalk

How to Operate POTTS Telescopic Ash Hoists

POTTS special Fixed or Swing Bail *Ash Cans* are placed in area, around base of hoist. Operator at grade level then "fishes" for, and catches, bail of can on hoist hook. Cans are raised to grade level without operator leaving his position.

Cans are easily swung over sidewalk level—guard gates being designed to swing outward permitting passage of can. See above illustration of *Model A.*

All POTTS *Hoist* Units revolve on ball bearing plates, insuring ease of operation.

Special Potts Features

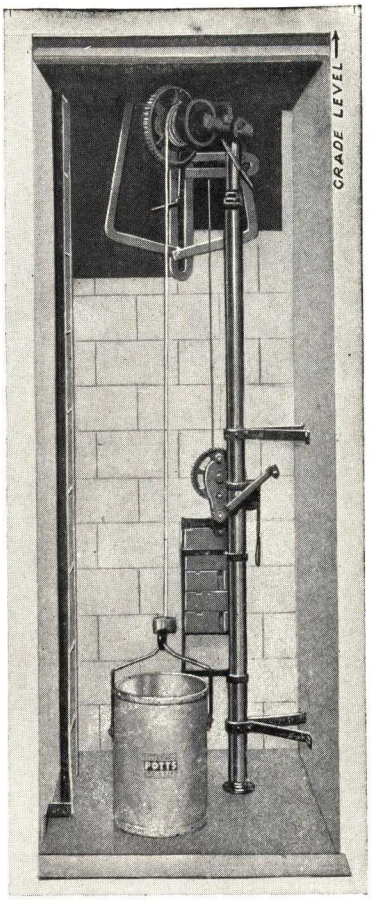
All POTTS *Telescopic Hoists,* when not in use, telescope under the sidewalk doors as illustrated.

The POTTS *Sidewalk Door Opening and Closing Device* automatically opens and closes the sidewalk doors as the operator at the basement level raises and lowers the hoist. No outside locking mechanism is necessary as the POTTS *Opening and Closing Device* is self-locking.

The POTTS *Safety Spring Guard Gates* automatically spring into position as the Sidewalk Doors are opened, and absolutely prevent the possibility of injury to passers-by.

The POTTS *Warning Gong* automatically sounds and warns pedestrians of opening sidewalk doors.

The POTTS *Heavy Iron Ladder* is designed for operator's use.



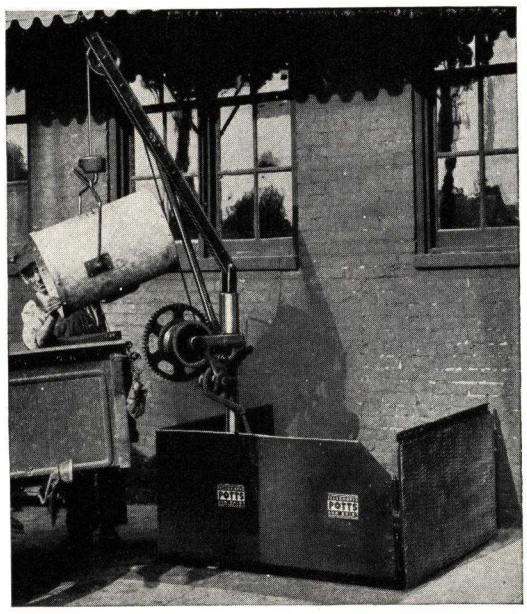
Potts Telescopic Hoist

At right is shown a Model A Hoist fully telescoped. Simple pressure on the telescoping handle in the basement raises the hoisting head, opening the sidewalk doors and sounding warning gong. Stop pin securely locks telescoping standpipe when fully raised. Ash cans can be placed at bottom of hoistway and hooked by operator standing at grade level

Hand-powered, Truck-dumping Model

Model B Hand-powered has the truck-dumping facilities of the *Model D-3* and the efficient and reliable features of the *Model A.* It is recommended for installation where hoistway is near curb or driveway and hoisting requirements do not demand an electrically operated model.

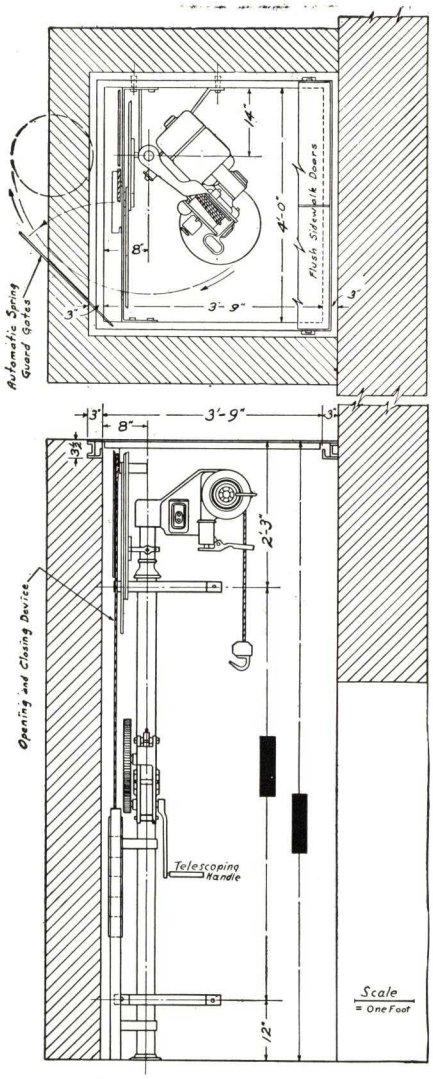
How to Specify—Furnish and install, where shown on plans, and in accordance with manufacturer's details, one POTTS hand-powered *Model B* Telescopic, overhead crane hoist, truck-dumping type, having maximum working capacity of 500 pounds with hoisting speed of 30 feet per minute as manufactured by the POTTS ASH HOIST CORPORATION of Mechanicsburg, Pa. For specifications of complete installation, including Sidewalk Doors, etc., see the following page.



Dumping Direct Into Truck

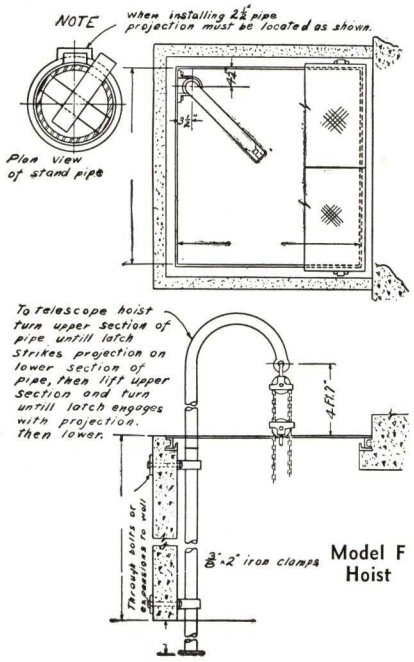
Operator of above *Model B* hand-powered overhead crane type hoist does not have to leave grade level to hook on cans in the basement for cable is equipped with weighted grab hook

POTTS ASH HOIST CORPORATION



Sample Plan and Elevation

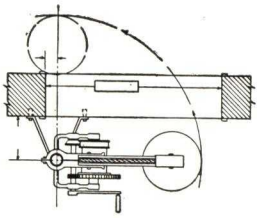
Above is shown plan and elevation of Potts Model E, electric hoist. It is strongly recommended that where possible, area openings measure 4'0"x4'0", as this permits use of Potts Standard Equipment



Model F Hoist

Non-telescopic Models

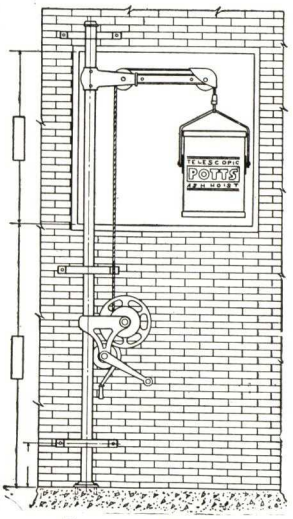
All Potts *Ash Hoists* may be furnished without the telescopic feature. Non-telescopic models are often required to meet unusual conditions, such as service inside of buildings, installations in open and exposed areas, etc. Potts *Ash Hoists may also be furnished with maximum capacities ranging to 1000 pounds.*



Basement Window Model

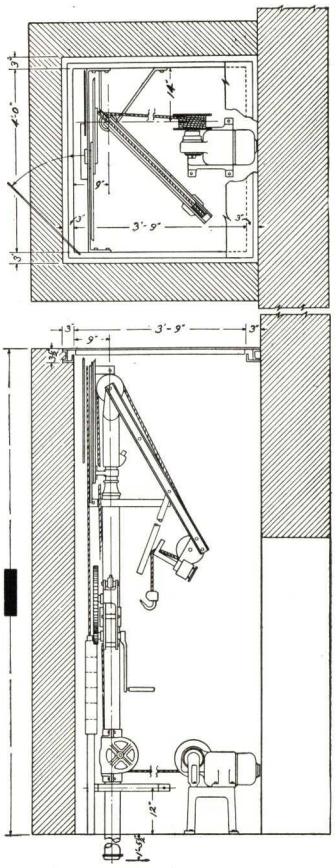
Designed especially for installation where conditions require cans to be swung through basement window or doorway.

How to Specify—Furnish and install where shown on plans, and in accordance with manufacturer's details, one Potts *Basement Window* hand-powered hoist, as manufactured by the Potts Ash Hoist Corporation of Mechanicsburg, Pa.



Basement Window

Elevation shows typical basement window installation. This model is recommended for use where no outside hoistways exist



Model D Hoist

Model D Hoist

Where installation is desired with motor mounted on basement floor, we recommend the Potts *Model D Hoist* which is otherwise similar to our *Model D-3 Hoist* shown on first page. This *Model D Hoist* permits dumping of cans directly into ash trucks.

Model F Hoist

Where low priced ash removal equipment is desired, we recommend the Potts *Type F Hoist* which is telescopic and equipped with either a chain or rope block. This hoist can be furnished to raise cans to grade or ash truck level. It is equipped with a special locking device, eliminating the use of any thru-pin or bolt.

How to Specify—Furnish and install where shown on plans and in accordance with manufacturer's details, one Potts Type F Telescopic Hoist with Differential Chain or Rope Block, as manufactured by the Potts Ash Hoist Corporation of Mechanicsburg, Pa.

Data on Potts Hoists

Complete specifications, detailed blueprints, and catalogues furnished on request.

Our Engineering Department will gladly suggest solutions of unusual hoisting problems.

Standard Specifications for POTTS Ash Hoists

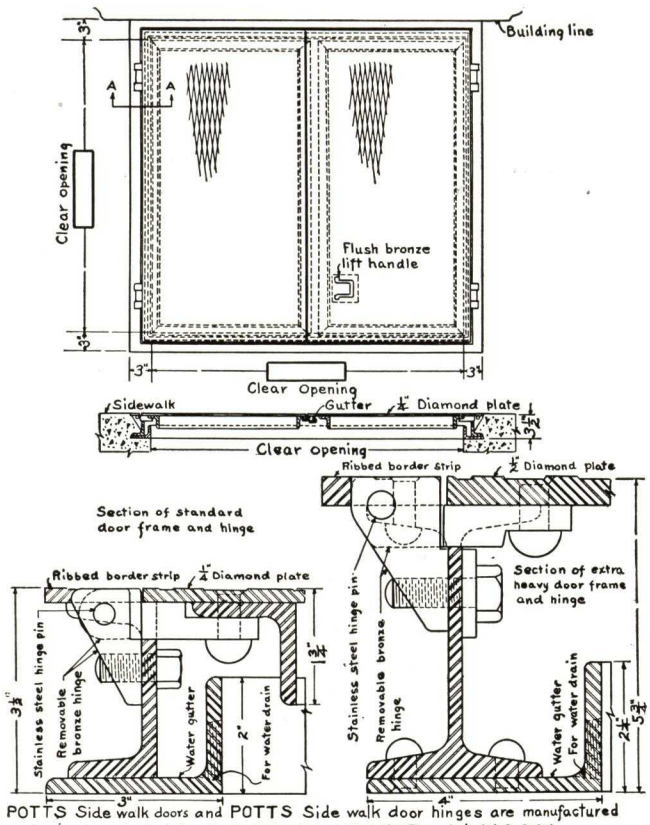
(For individual specifications see description of hoist model)

Furnish and install where shown on plans and in accordance with manufacturer's details, one Potts *Standard Water-tight* double-leaf *Sidewalk Door* equipped with leaves constructed of diamond plate steel (or leaves of diamond plate steel, fitted with vault light lenses), also one Potts *Automatic Sidewalk Door Opening* and *Closing Device,* Potts *Automatic Safety Spring Guard Gates,* Potts *Automatic Warning Gong,* and Potts *Heavy Iron Ladder* for operator's use.

Furnish and deliver to building contractor (number required) Potts *Standard Galvanized Hoisting Cans* 24 in. high by 17 in. in diameter, fitted with fixed or swing bails.

Furnish and deliver to building contractor one Potts *Rubber-tired Ash Can Truck.* All of the above as made by the Potts Ash Hoist Corporation of Mechanicsburg, Pa.

Note: Specify Fixed Bail Cans for use with Models A, E, C and Basement Window. Specify Swing Bail Cans for use with Models B, D and D-3.



POTTS Sidewalk doors and POTTS Sidewalk door hinges are manufactured under, and protected by, U.S. Patents. 1,462,805 and 1,462,806.

Potts Patented Sidewalk Door

How to Specify—Standard Doors

Furnish and install, where shown on plans and according to manufacturer's specifications, one Potts Standard Flush Watertight Sidewalk Door. Constructed with diamond plate leaves reinforced on under side with angle irons, heavy bronze hinges with stainless steel hinge pins, channel iron frame, and angle condensation gutter tapped for ¾-in. drain pipe, as manufactured by the Potts Ash Hoist Corporation of Mechanicsburg, Pa.

How to Specify—Extra Heavy Doors

Furnish and install where shown on plans and according to manufacturer's specifications, one Potts Extra Heavy Flush Watertight Sidewalk Door. Constructed with ½-in. diamond plate leaves reinforced with 3-in. I beams bearing directly on I beam frame, heavy bronze hinges with stainless steel hinge pins, and condensation gutter tapped for 1-in. pipe, as manufactured by the Potts Ash Hoist Corporation of Mechanicsburg, Pa.

Potts Sidewalk Doors Since 1883

We have been manufacturing doors for over 50 years, which have met the most rigid requirements. They can be furnished with leaves of solid diamond plate steel or leaves of diamond plate steel equipped with vault light lenses. Construction is rugged and designed for long life.

Frame is equipped with condensation gutter, tapped for standard plumber's drain-pipe connection.

Hinges are of heavy cast bronze, so designed that entire surface of door lies flush with surrounding pavement.

Types: Standard—Constructed to sustain live load of 300 pounds per square foot.

Extra Heavy—Designed to withstand heavy driveway truck traffic.

Special sizes of either type can be furnished.

Complete details and specifications sent on request.

Potts Ash Cans are constructed throughout of No. 16 gauge galvanized iron, 17 in. in diameter, 24 in. high, and reinforced at top and bottom with 1¼ x ¼-in. steel bands, heavily riveted. Use Potts Rubber-tired Ash Can Trucks

Potts New Model Sidewalk Elevators

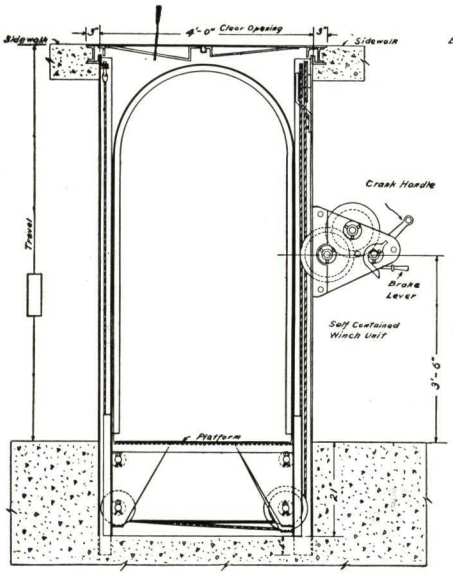
We have a complete line of *hand-powered* and *electric sidewalk elevators* for the raising and lowering of objects of all dimensions.

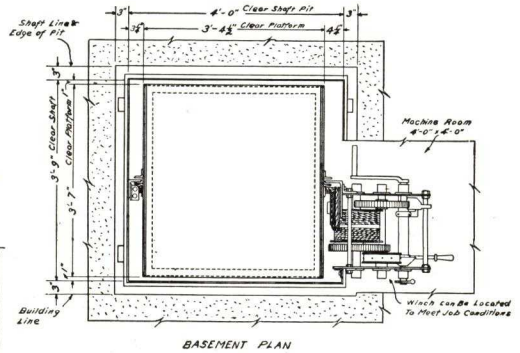
Hand-powered elevators are built both in standard sizes and to fit existing conditions. Capacities range from 1000 to 1500 pounds for the medium duty machine and from 2000 to 3000 pounds for the heavy duty type.

Electric sidewalk elevators are manufactured in capacities ranging from 500 to 4000 pounds, with speeds from 20 to 30 feet per minute. Control is by push button, hand cable or car switch. Elevators operate on direct current or 3-phase alternating current.

Medium duty elevators are of the 2-point suspension type; heavy duty elevators are of the 4-point suspension type.

Potts Sidewalk Doors, both water-tight and non-water-tight types, are specially designed for these elevators. Where door-opening bows are desired, sidewalk doors are equipped with bow strike plates.





BASEMENT PLAN

How to Specify—Furnish and install where shown on drawings and in accordance with manufacturer's details, one Potts manually-operated (or electric) Sidewalk Elevator as manufactured by the Potts Ash Hoist Corporation of Mechanicsburg, Pa.

AMERICAN CHIMNEY CORPORATION

147 Fourth Avenue, NEW YORK, N. Y.

BRANCHES

PHILADELPHIA, PA., Stephen Girard Building
BOSTON, MASS., 131 Clarendon Street
DETROIT, MICH., 2832 E. Grand Boulevard
CLEVELAND, OHIO, 304 Chester-Twelfth Building
COLUMBUS, OHIO, 243 No. High Street

SPECIALISTS IN EVERY PHASE OF CHIMNEY CONSTRUCTION, MAINTENANCE AND REPAIR

Products

PERFORATED RADIALBRICK CHIMNEYS; ACIDPROOF CHIMNEYS; HIGH TEMPERATURE CHIMNEYS; ORNAMENTAL CHIMNEYS, REFRACTORY LININGS for steel stacks.

REPAIR WORK including heightening of chimneys; demolition; installation and maintenance of Lightning Rods; etc.

Service

Thirty-six years of experience in every phase of chimney work enables us to render valuable service to architects, engineers and owners. We will be glad to confer with you at any time.

Through an affiliated business, the Refractory Construction Co., Inc., we offer you our services for Boiler Settings and Furnace Work.

Necessary Information for Estimates

(1) Intended use of chimney (boiler furnace, smelter, chemical plant, incinerator).

(2) Height above foundation and diameter or boiler horsepower or number, type and dimensions of boilers.

(3) If a bid is desired on foundation, give character of soil.

(4) Does chimney stand independent of building? If it is a part of the building, state for what height.

(5) Give hauling distance from purchaser's railroad siding or nearest railroad freight yard.

(6) If possible, give approximate prices of building materials and wage scale of local common labor.

Other Work—Estimates furnished on boiler brickwork and construction and repair of industrial furnaces.

Determining Chimney Dimensions

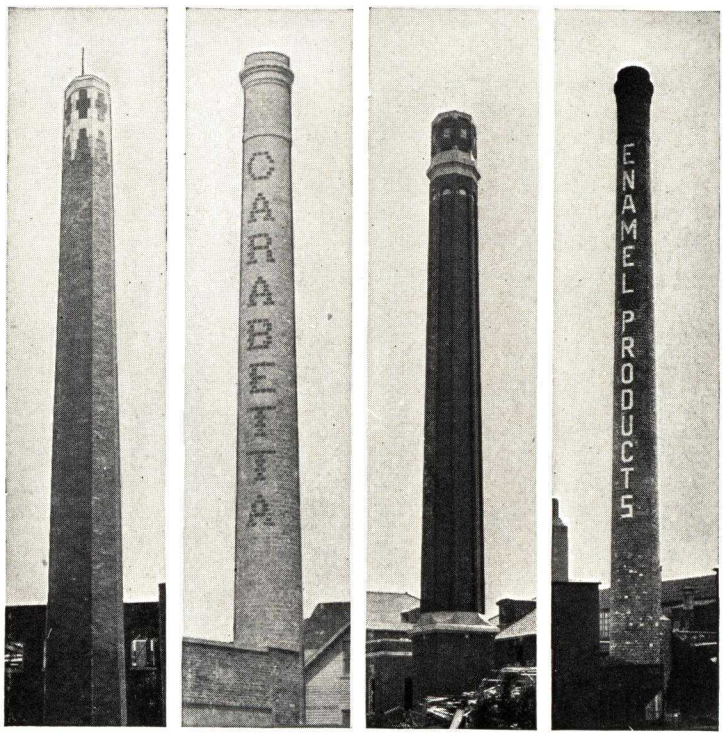
Principal dimensions of a chimney can be determined on the basis of the line drawing below. To determine the bottom outside diameter of chimney use the following:

H/D-15; increase outside diameter of chimney by 2 ft. 3 in. for 100 ft. in height.

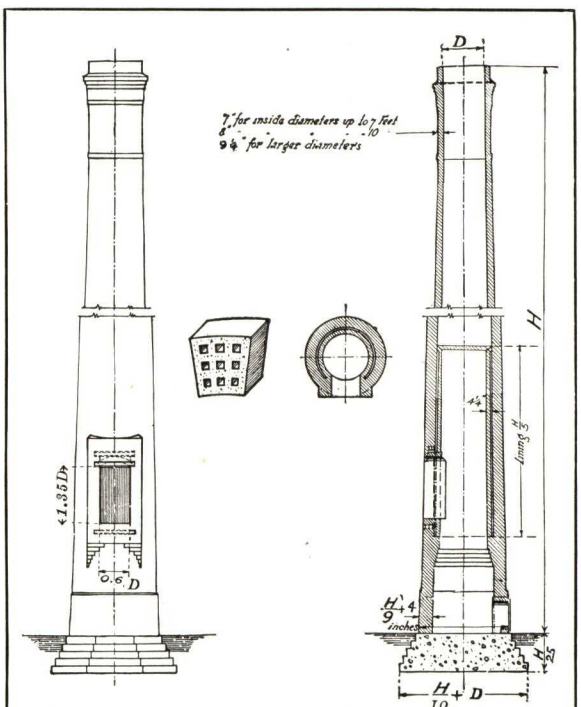
H/D-20; increase outside diameter of chimney by 4 ft. for 100 ft. in height.

H/D-30; increase outside diameter of chimney by 4 ft. 6 in. for 100 ft. in height.

Lining—A protective lining should be provided in every instance. It should be equal to one-fifth of the height of the chimney in case of boiler plants; one-half height of the chimney for stacks carrying temperatures of 800° to 1200°, and a high grade fire brick lining for the entire height of the chimney where the temperature exceeds 1500°.



A Few Typical "American" Chimneys



Design Data—Chimney for Boiler Operation

ALPHONS CUSTODIS CHIMNEY CONSTRUCTION CO.

Designers and Builders of All Types of Masonry Chimneys

GENERAL OFFICE
135 William Street, NEW YORK, N. Y.

BRANCH OFFICE
Marquette Building, CHICAGO, ILL.

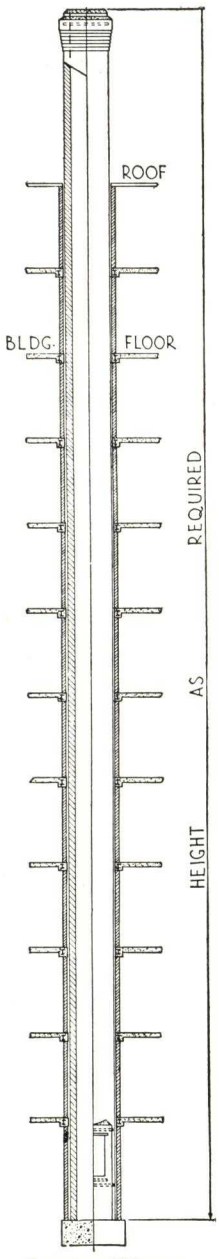
SALES OFFICES

ATLANTA, GA. BALTIMORE, MD. BOSTON, MASS. CINCINNATI, OHIO CLEVELAND, OHIO DETROIT, MICH. INDIANAPOLIS, IND. LOS ANGELES, CAL. MILWAUKEE, WIS. MINNEAPOLIS, MINN. PHILADELPHIA, PA. PITTSBURGH, PA. PORTLAND, ORE. RICHMOND, VA. ST. LOUIS, MO. SAN FRANCISCO, CAL. SEATTLE, WASH. WASHINGTON, D. C.

Architectural Chimneys

A chimney is a necessity where draft is required for boiler operation or process purposes. Architecturally it is a problem but properly treated it can be made a feature.

We are glad to assist Architects in preparing chimney specifications. The chimney may be free standing and independent, banded to the building or superimposed on roof of building.



Interior Chimney

Interior Chimneys

Interior chimneys of perforated radial brick construction for apartment houses, hotels, office buildings, etc., take up very little space and insulate the heat of the flue gases. Where an offset in the shaft is required it can be effected with an insulated metal "goose neck."

Foundations

We furnish foundation designs without charge. These are of the spread type for normal soil, simple footings where rock is encountered, or special designs where the soil is deficient in bearing power—specially deep foundations and foundations to rest on piles or caissons.

Repairs, Alterations and Lightning Rods

We heighten old chimneys, cut new openings and perform necessary repair work while the chimney is in operation. Obsolete chimneys dismantled or thrown as circumstances permit. Lightning rods attached and repaired.

Service

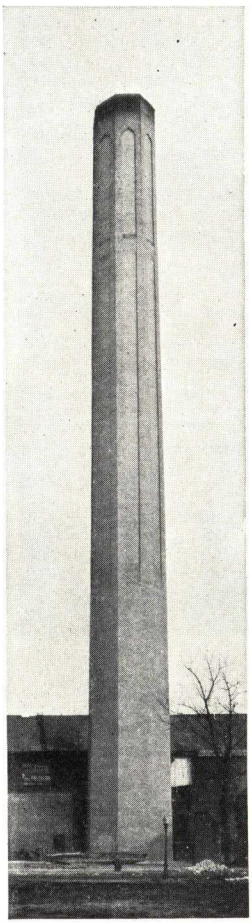
Estimates gladly furnished at all times. Through our foreign associates and connections we can figure work in any part of the world. Write for descriptive literature or our text book catalogue S.A. 10.

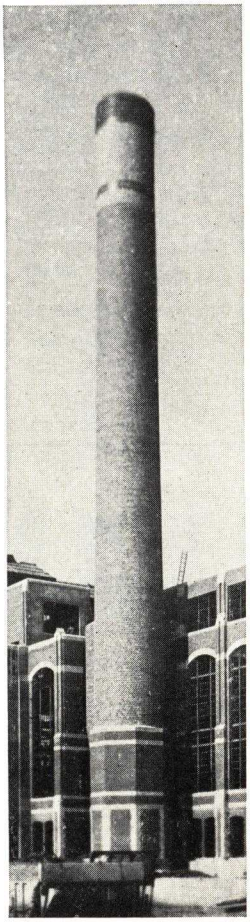
Types

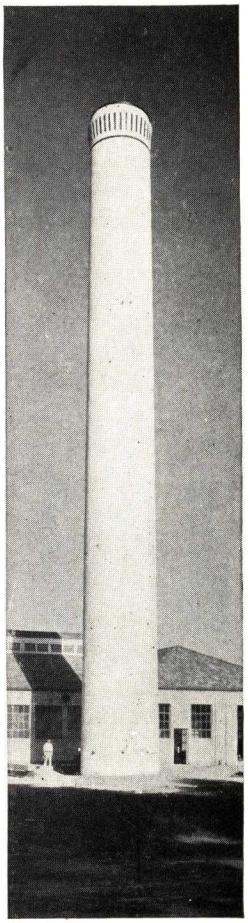
We erect all types of masonry chimneys—common brick, face brick veneer, perforated radial brick and reinforced concrete chimneys. One of these types will fit every architectural scheme and meet the economic requirements of the particular situation. For over forty years we have been building chimneys throughout the United States. During this time we have erected some of the largest and best known chimneys in the world. We use our own skilled mechanics and carefully select the sources of our material supplies.

Linings

Where low temperatures introduce moisture and aggressive acids, we provide a lining which is especially adapted to resist the conditions encountered. High temperatures, on the other hand, are provided for by special refractory linings.


Face Brick Chimney
200'x13' 0"


Radial Brick Chimney
175'x12' 6"


Concrete Chimney
125'x8'

W. S. DICKEY CLAY MFG. CO.

ESTABLISHED 1885

BIRMINGHAM, ALA. CHATTANOOGA, TENN. KANSAS CITY, MO. SAN ANTONIO, TEX. TEXARKANA, TEX.

Address Correspondence to the Nearest Office

DICKEY
Vitrified Salt-Glazed Clay Products are *EVERLASTING*

Products

Fire Clay Flue Lining, Chimney Tops; Fire Brick and Fire Clay; Vitrified Salt-Glazed Clay Sewer Pipe, Culvert Pipe, Segment Sewer Blocks, Wall Coping, Septic Tanks, Silos, Meter Boxes; Vitrified Clay Flashing Blocks and Drain Tile. Complete specifications and descriptions may be obtained by writing for the free illustrated booklets on all the products listed.

Flue Lining

Dickey improved flue lining—hard-burned, semi-glazed—prevents disintegration from condensation. Provides a straight, uniform flue. Prevents fires commonly caused by unlined chimneys.

Chimney Tops

Practical as well as ornamental. By adding height to chimneys, they provide better draft. More durable than metal.

Fire Clay Stove Pipe Thimbles

Sizes—6, 8, 10 and 12 in. Lengths—4½, 6, 9 and 12 in.

Sewer Pipe

Dickey quality sewer pipe (4″ to 36″ diameter) is known for its unusual strength. Acid and gas-proof. All sizes made to meet A.S.T.M. and Federal specifications.

Double Slant Wall Coping

Made of vitrified salt-glazed clay in sizes to fit 9, 13 and 18-in. walls. Straight coping in 2-ft. lengths. Fittings—right and left corners, right and left tees, starters and closed ends.

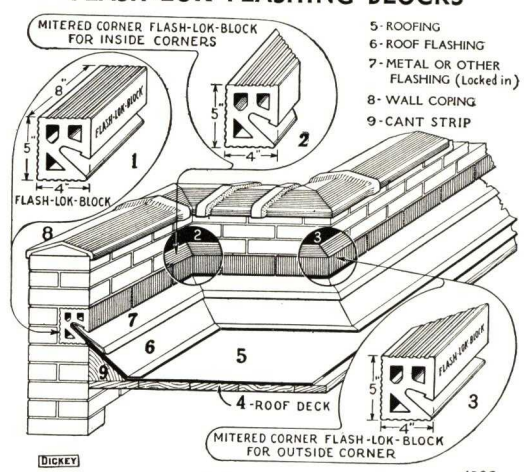
Drain Tile—Without Socket

Glazed and unglazed. Sizes 4″ to 36″.

Flash-Lok Flashing Blocks

Provide a practical and durable receptacle to hold securely various types of roof flashings, thus preventing troublesome flashing leaks. Walls and webs are substantial. Made in convenient length, they displace two bricks. Mitered corners furnished for inside and outside corners.

FLASH-LOK FLASHING BLOCKS



SPECIFICATIONS

Size, in.	Approx. weight crated, lbs.	Blocks in crate	Approx. weight mitered pair crated, lbs.
4x5x8	10	15	14

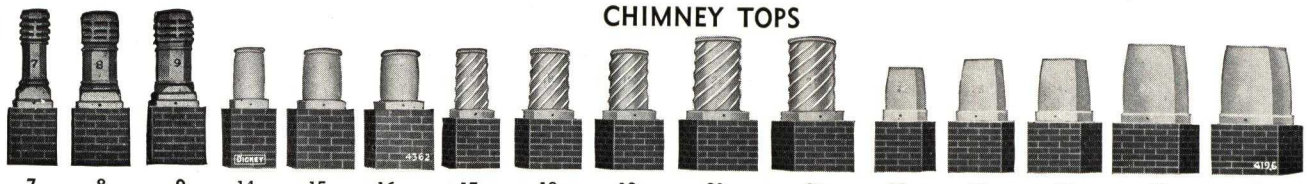
Septic Tanks

Consist of three or more sections of specially made vitrified salt-glazed clay pipe, laid horizontally. Sections are separated by vitrified clay baffle walls. Each section is equipped with vitrified salt-glazed clean-out covers. Size of section—2 ft. in diameter, 3 ft. in length.

Capacity — Three sections care for the average residence housing five persons. Capacity can be easily increased by simply adding more sections.

The Dickey Septic Tank is the ideal solution of sanitary sewage disposal for suburban and rural homes and buildings. It is odorless, automatic and operates successfully in any weather. No chemicals are required. Sewer gases and acids can not damage the vitrified clay.

CHIMNEY TOPS



SPECIFICATIONS

No.	Height, over all, in.	Fits over flue lining size, in.	Base dimen. outside, in.	Approx. weight each crated, lbs.	No.	Height, over all, in.	Fits over flue lining size, in.	Base dimen. outside, in.	Approx. weight each crated, lbs.
7	40	8½x8½	13½x13½	145	19	30	13 x13	16½x16½	150
8	40	8½x13	13½x16½	150	20	36	13 x17½	16½x20½	190
9	40	13 x13	16½x16½	180	21	36	17½x17½	20½x20½	215
14	24	8½x8½	13½x13½	90	22	20	8½x 8½	14 x14	90
15	24	8½x13	13½x16½	110	23	24	8½x13	14 x17	110
16	24	13 x13	16½x16½	120	24	24	13 x13	17 x17	125
17	30	8½x8½	14 x14	115	25	30	13 x17½	17 x21	195
18	30	8½x13	14 x17	135	26	30	17½x17½	21 x21	200

Ask About Other Designs Made for All Standard Size Chimneys!

THE M. W. KELLOGG COMPANY

Manufacturers of Perforated Radial Brick Chimneys

GENERAL OFFICES AND WORKS
JERSEY CITY, N. J.

NEW YORK SALES OFFICE: 225 Broadway

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CANADIAN KELLOGG CO., LTD., MONTREAL, QUE., TORONTO, ONT., WINNIPEG, MAN.

Products

Designers and Builders of PERFORATED RADIAL BRICK CHIMNEYS; REINFORCED CONCRETE CHIMNEYS; ACIDPROOF CHIMNEYS; HIGH TEMPERATURE CHIMNEYS.

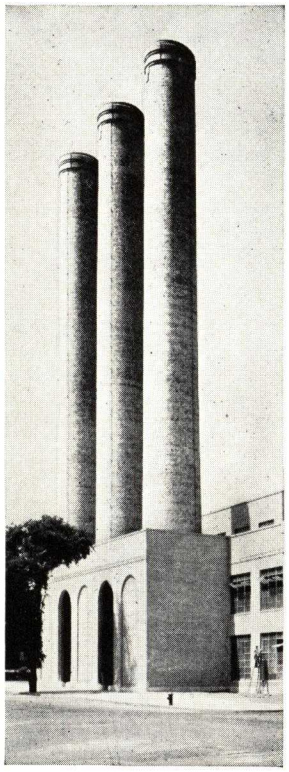
REPAIRING and HEIGHTENING OLD CHIMNEYS; LIGHTNING RODS installed and repaired.

IGNISITE HIGH TEMPERATURE CEMENT; KASTIC DRY MONOLITHIC REFRACTORY; KALOLITH PLASTIC MONOLITHIC REFRACTORY and CHIMNEY LININGS.

Service

THE M. W. KELLOGG COMPANY has erected some of the finest chimneys in the United States during the last 37 years, and is ready to share the results of that experience with engineers and architects who are engaged in problems where chimney construction is required.

This Company's engineers will be glad to advise on types, sizes, shapes, etc., of chimneys for any conditions that may exist.



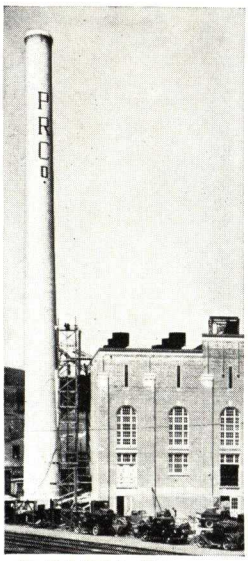
New York City Incinerator

Kellogg Perforated Radial Brick Chimneys

No artificially produced material for the construction of the modern factory chimney compares with refractory clay. This raw material is put through a variety of scientific treatments by skilled hands and especially designed machines before it comes from the kilns in the form of perforated radial brick ready for shipment, and for use in chimney construction.

Bricks are made to conform closely with the circular and radial lines of the shaft and are weatherproof and acidproof.

The perforations in the radial bricks form a dead air space about the core of the chimney. This has a marked effect in reducing amount of fuel used, in preventing sudden changes in temperature within the chimney, and in reducing radiation. Thus a uniformly maximum draft is maintained in any kind of weather.



Radial Brick Chimney, Pequanoc Rubber Co., Butler, N. J.

Reinforced Concrete Chimneys

Concrete chimneys are constructed by steel forms for both the inside and the outside and are adjusted to insure accurate taper and desired wall thickness. Concrete chimneys are reinforced vertically and horizontally with steel bars and electrically welded rectangular wire mesh.

Repairing and Heightening

Brick chimneys, concrete chimneys and steel chimneys repaired. We can perform work while chimney is in operation. We heighten old chimneys without interruption to plant. Brick, concrete and steel chimneys demolished without danger. Inspections of all kinds of chimneys and reports and recommendations made.

Lightning Rods

We install and repair lightning rods.

Refractory Products

Ignisite High Temperature Cement, for bonding all forms of brickwork.

Kastic Dry Monolithic Refractory, a castable monolithic material.

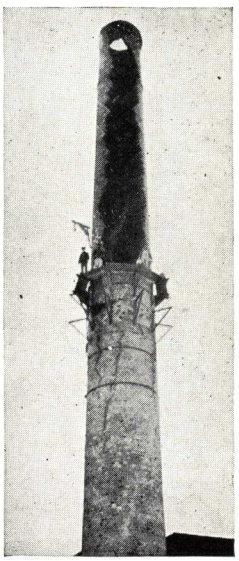
Kalolith, a plastic monolithic refractory.

Thermostic, a plastic insulating material.

Standard Specifications

Send for free set of M. W. Kellogg Standard Specifications giving complete information as to sizes, design, weights, etc., of chimneys, including a detailed specification.

We will also be glad to send complete literature on all our Refractory Products.



Repairing Chimney, Bethlehem Steel Co., South Bethlehem, Pa.

MEMORANDA

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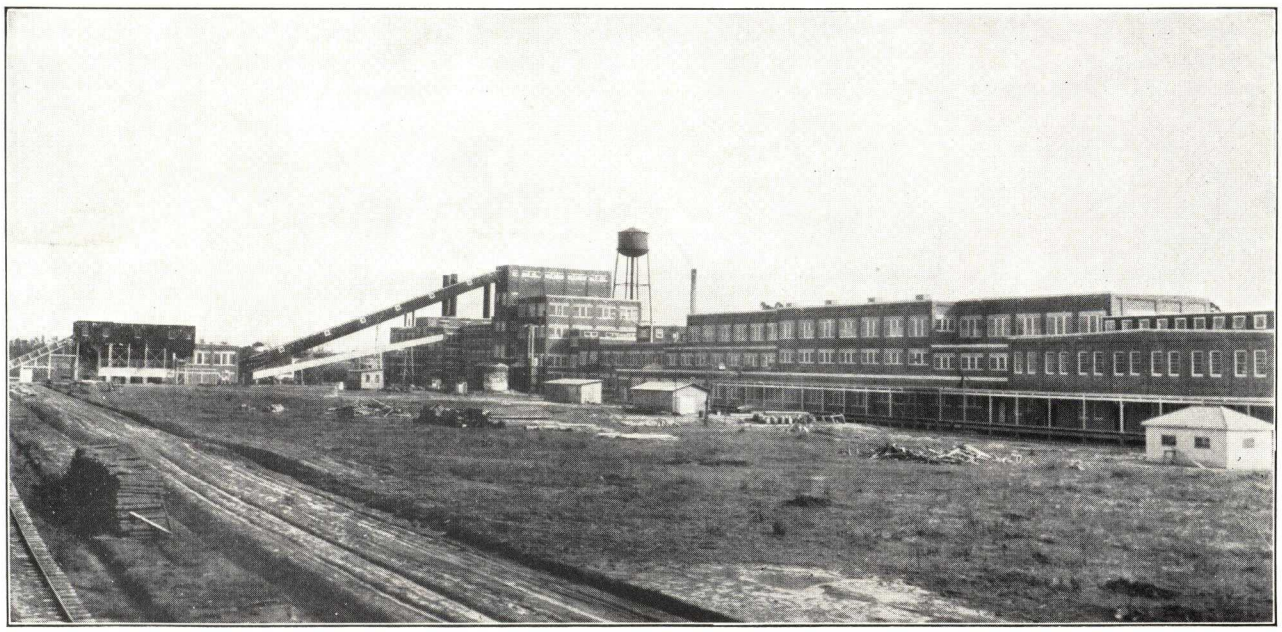
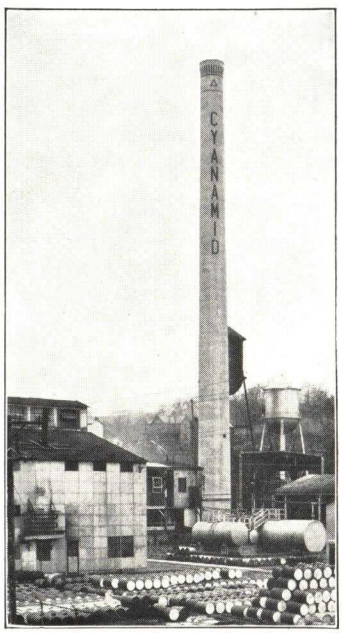


200-Ton Pulp and Paper Mill, Crossett Paper Mills, Crossett, Ark.
Complete plant, including all equipment, constructed by THE RUST ENGINEERING CO.



Complete Power Plant and Concrete Chimney

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COMPLETE INDUSTRIAL PLANTS
WATERPROOFING
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CEMENT MILLS
GRAIN ELEVATORS
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REINFORCED CONCRETE CHIMNEYS
ACID-PROOF CHIMNEYS
RADIAL BRICK CHIMNEYS
FACE BRICK AND COMMON BRICK CHIMNEYS
REPAIRING AND REMODELING OLD CHIMNEYS
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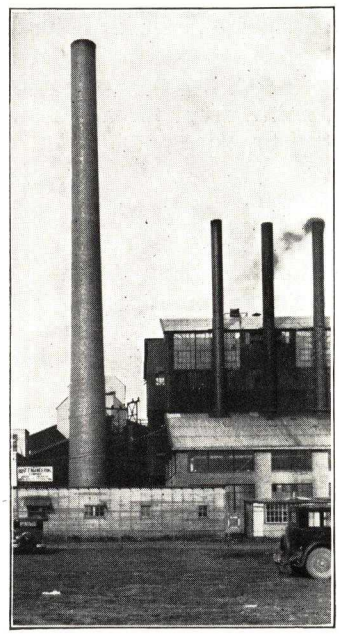


Complete Industrial Plant and Radial Brick Chimney

BENNETT FIREPLACE COMPANY

1 State Street, NORWICH, NEW YORK

Representatives in 50 Principal Cities and Dealers Throughout United States and Canada

Products

Fireplace Heating Units, both recirculating and fresh air types.

BENNETT *Guaranteed* FIREPLACES

Expanslip Throat Damper, Miscellaneous Fireplace Construction Equipment, the Bennett Flexscreen.

BENNETT FIREPLACE UNITS

Bennett Fireplace Units are heavy welded steel forms which govern the construction of all out-of-sight but vital details of the fireplace. The throat damper, combustion chamber, down-draft shelf, firebox or back and air heating chambers, are one integral unit.

A Bennett Unit assures (1) strong smokeless draft, (2) far more heat from the fuel, (3) accurate low cost construction, and (4) certain air-conditioning and ventilating benefits. There is no effect on outward appearance or limitations in architectural design.

Bennett Units Have Been Built Since 1923

RECIRCULATING—Model R

Strong Smokeless Draft

With the unit as a form, construction affecting draft *must* be identical with thousands of guaranteed and thoroughly proven Bennett Fireplaces, relieving the architect or mason contractor of any risk of poor draft.

Real Heating Efficiency

Cold air is drawn off the floors, passed through heating chambers at the sides and back of the firebox, then through others completely surrounding the throat and delivered into the room, giving three times the heat.

Extra from throat chambers alone is equal to common fireplace.

Structually Better

Extra heavy plate of special analysis steel to resist both heat and corrosion is used. Properly distributed cooling air flow throughout firebox and *throat,* plus provision for expansion internally prevents damage to unit or masonry. Mineral wool packing is not required either for expansion or heat loss.

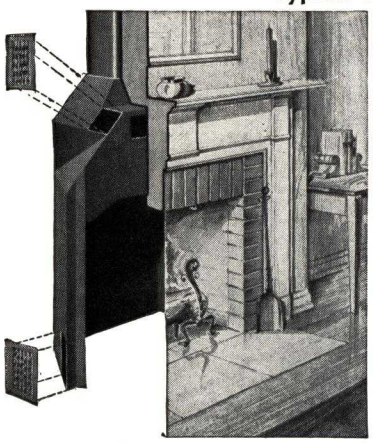
Construction Savings

Saves (1) purchase of flue damper and many fire brick, (2) much of mason's cutting, fitting and corbeling, (3) possible later rebuilding to correct poor draft.

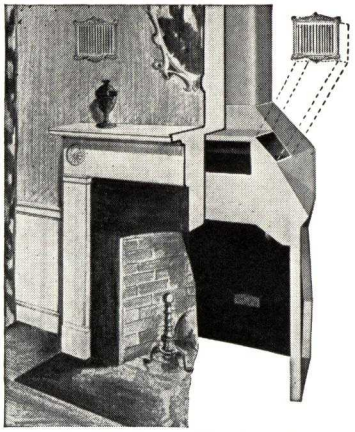
Where to Use Model R

Moderate cost houses or summer camps, where there is not tight weatherstripping or air-conditioning, where auxiliary heat is needed, and certainty of strong smokeless draft.

Typical Installations



Model R Unit—Half Installed



Model FM Unit—Half Installed

FRESH AIR TYPE—Model FM

Model FM offers all the benefits of Recirculating Model R —*strong smokeless draft, proper structural design, construction savings,* plus these added advantages.

With Air Conditioning

Many heating engineers will not allow a fireplace in an air-conditioned, tightly insulated and weatherstripped house unless Fresh Air Model FM is used. Common fireplaces or those with recirculating type units upset the "balance" of conditioning systems and in tight houses, may smoke for lack of replacement air to supply combustion. A unit delivering *outdoor air,* fresh and warmed, is the only answer to these problems. Here fireplace heating differs from furnace practice. (See diagrams next page.)

Principle of Outdoor Air

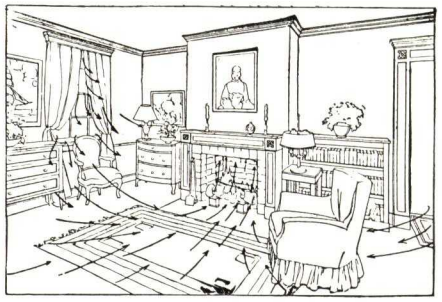
Also stops cold floor drafts, cold air infiltration in other parts of the house, distributes heat very evenly, and ventilates thoroughly, carrying away tobacco and cooking odors. It gives many air conditioning benefits in its own right.

Highest Heating Effectiveness

The series of heating tubes crossing the throat out of sight, in addition to the back and throat chambers, will thoroughly heat outdoor air regardless of subzero weather. Model FM provides from five to six times the heating effectiveness of a common fireplace.

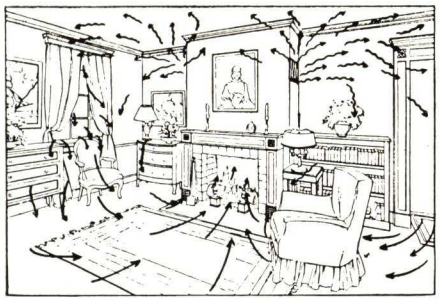
Where to Use Model FM

Always where there is air-conditioning or extra tight construction, in camps used in cold seasons, wherever greatest heating effectiveness is needed.



Common Fireplace

The flow from an average fireplace flue (13 x 13) is 300 cu. ft. per minute. This air is drawn from the room at room temperature (70°). To replace air drawn out an equal amount seeps in through cracks all about the house from outdoors, at outdoors temperature (say 30°). Net results: that part of room in zone of radiant heat is warmed, rest of house is chilled, heat controls are upset, cold drafts sweep across floors



Recirculating Fireplace

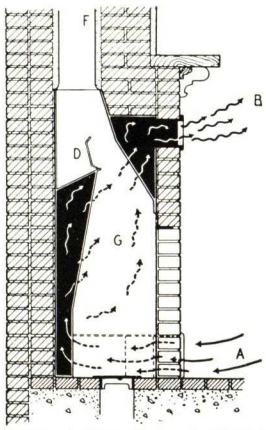
Cold air is drawn off the floor into heating chambers, is warmed thoroughly and returned to the room. This *extra* heat is equal to three times the radiation from a common fireplace and circulates evenly throughout the room and to connecting rooms. Cold air infiltration to supply draft up the chimney continues, but start floor drafts are tempered by warm air from unit

Wavy lines represent heated air circulation, straight arrows, cold drafts. Exact figures are used above to illustrate typical conditions

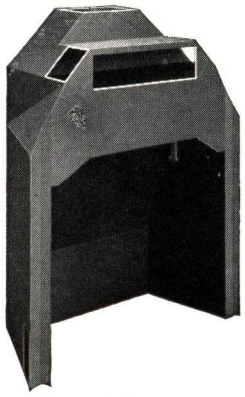
Fresh Air Fireplace

Unit is connected with outdoors and air to replace that drawn from building by chimney comes in through heating chambers rather than seeping through small cracks about the house. Net results: replacement air comes in heated (220°), not cold (say 30°); temperatures and air conditions throughout the house remain constant; cold floor drafts are eliminated; yet, fresh warmed air is circulating 5 to 6 times the heat evenly to all accessible rooms

Model R

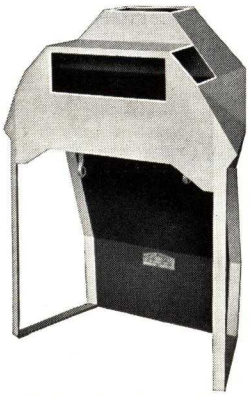


Air Circulation Through Model R

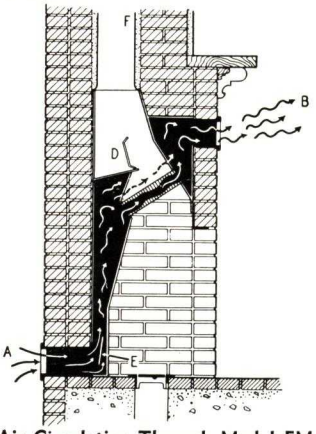


Model R Uninstalled

Model FM



Model FM Uninstalled



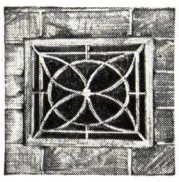
Air Circulation Through Model FM

Recirculates air from the building. Through two intake grilles, cold air (A) is drawn from the floor into the unit, passes to back heating chamber, then across the side heating chambers (G) to the throat heating chamber. From there it flows into the room (B) through one or more grilles.

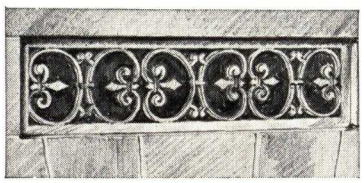
For differences between Model R and Model FM in application, see page preceding.

Circulates fresh outdoor air, which enters (A) the unit through a louvre in the back wall, or in the case of an inside chimney, through a duct below floor level. Damper (E) tightly shuts off air when not required for heating or ventilating. After entering air rises up the back heating chamber, passes around and across the intense heat of the throat through highly efficient patented heating tubes into the throat heating chamber. From there it flows into the room through one or more grilles placed as desired.

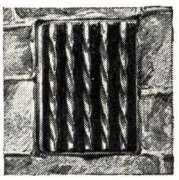
BENNETT GRILLES



Style A



Style C



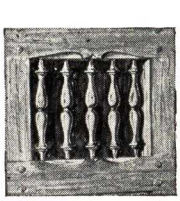
Style D

STANDARD GRILLE SIZES, INCHES

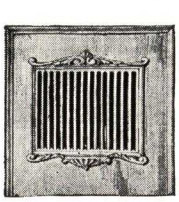
Style A.....	5 x 8	8 x 8	10 x 8	10 x 10
Style C.....	14 x 5	20 x 5	26 x 5	32 x 5
Style D.....	5 x 8	8 x 8	8 x 10	10 x 10
Style E.....	5 x 8	8 x 8	10 x 8	10 x 10
Style F.....	8 x 5	8 x 8	10 x 8	.....
Style J.....	8 x 5	8 x 8	10 x 8	also
	14 x 5	20 x 5	26 x 5	32 x 5
Intake louvre.....		12 x 6	16 x 6	16 x 9

Bennett grilles are carefully designed and made as a permanent part of the fireplace deserves to be. They should be specified *with shut off* if heat from the unit is delivered to more than one room. Fan attachments at the intakes of Model R increase efficiency about 50% but rarely are required for Model FM because of its *natural forced circulation.* Outlet grilles placed as near the ceiling as possible increase efficiency.

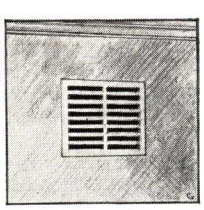
Intake Louvre—Shown opposite, is used only for the *outdoor* intake of Model FM. Gives the opening protection against snow, rain, dust and insects.



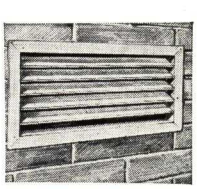
Style E



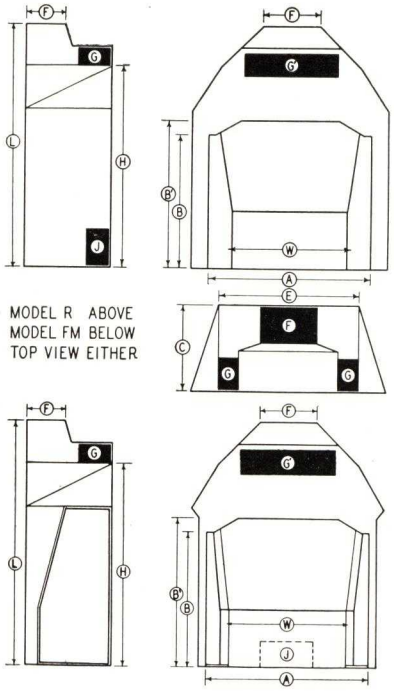
Style F



Style J



Intake Louvre



Model FM

SPECIFICATIONS AND DIMENSIONS (INCHES)

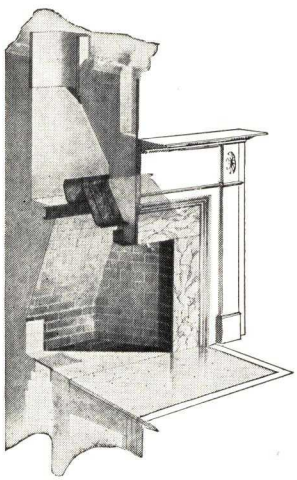
Model R is made in sizes 25, 28, 34, 37 and 43 ins.
Model FM is made in sizes 31, 34, 37, 43, 49 and 61 ins.

Size of unit, inches	25	28	31	34	37	43	49	61
A. Max. width of opening	25	28	31	34	37	43	49	61
B. Max. height opening straight	24	25	28	28	28	28	31	42*
B. Max. height opening arched	26	28	31	31	31	31	34	45*
C. Depth of unit	16	18	18	18	18	21	24	.....
E. Width across back	21	23½	.....	29½	32	39	43	.....
F. Size flue lining tile	8½x8½	8½x13	8½x13	8½x13	13x13	13x13	13x18	18x18
G. Outlet grille using 2	5x8	5x8	5x8	8x8	8x8	8x10	8x10	10x10
G. Single center grille	14x5	14x5	14x5	20x5	20x5	26x5	26x5	32x5
H. Min. grille height	40	41	42	42	42	44	48	.....
J. Air intake opening, Model R	5x8	5x8	.....	5x8	8x8	8x8	8x10	.....
J. Intake opening, Model FM	.....	.....	12x6	12x6	12x6	16x6	16x6	16x9
L. Height unit over all	45	46	48	51	52	57	60	.....
W. Max. fuel length	15	18	21	24	26	31	36	48

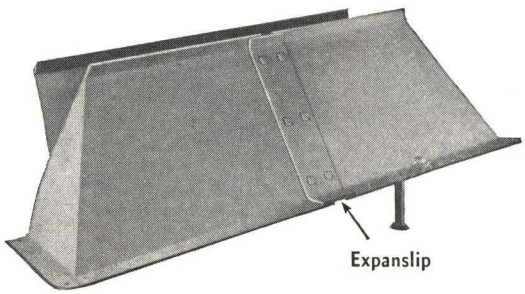
*This height of unit gained by raising unit up to 9 ins. above hearth on fire brick. Normal height of 61-in. opening is 33 ins. *if straight,* 36 ins. if arched.

Complete directions covering the simple installation are shipped with each unit.

BENNETT EXPANSLIP THROAT DAMPER



Damper—Half Installed



Expanslip Construction

A simple bolted slip joint which takes up all lengthwise heat expansion. Without it the mason *must* leave space at each end, or the damper will either damage itself or crack the masonry. Any damper should have this feature.

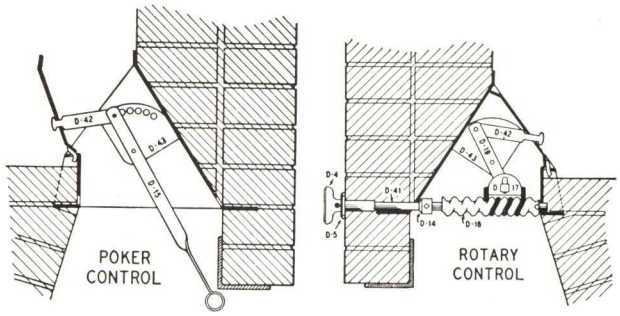
More Perfect Proportions

More perfect proportions are possible in steel dampers. There are limitations to cast design but none on welded plate. For example, the usual front slope is 45° — very flat. Bennett has a 60° pitch — 33% less resistance to passage of smoke. Also this steeper slope allows the damper to be placed farther forward, out from under the flue and down the draft zone. And larger combustion chamber and more generous downdraft shelf are possible.

Structural Steel

Structural steel always has had desirable advantages for dampers and is thoroughly practical with Expanslip Construction to take up the greater expansion of steel.

Structural steel will not break in transit, during construction or in years of use. No strain can develop from constant heating or cooling and there can be no flaws or thin spots as in cast. Steel is rolled to exact thickness required at all points. Frames of Series 30 and 36 are ⅛-in. plate, $\frac{3}{16}$-in. in Series 42 and ¼-in. plate in larger sizes. Special rust and heat resistant steel is used.



Damper Controls

Damper controls are extremely simple mechanically, but give positive draft control. Either poker or rotary is offered and parts are fully interchangeable even on the job.

Notice in the diagrams that there are no tension springs or heavy counterweights. Notice, too, the worm and *self-cleaning* traveler coil which soot accumulations cannot stick or jam.

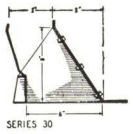
Designed for Area of Opening, Not Just Width

A damper designed for a 42x30-in. opening is not right for one 42x36 or 42x42 ins. Respectively, 20% and 40% more throat capacity is needed.

Bennett Dampers are made in three series — 30, 36 and 42-in., the series number designating the maximum opening height. So specify the full Bennett size — 43x36-in. for example, and be sure. Openings over 42 ins. high should have specially designed dampers.

Depth of the opening is also considered. The larger the opening the more provision for depth in the design.

SPECIFICATIONS


SERIES 30

SERIES 36

SERIES 42

Max. width of opening	25	28	31	34	37	43	49	55	61	73
Series 30-in.										
Maximum size of opening, in.	**25x30**	**28x30**	**31x30**	**34x30**	**37x30**	**43x30**	49x30	55x30	.....	.....
Proper flue tile size, in.	**8½x8½**	**8½x13**	**8½x13**	**8½x13**	**13x13**	**13x13**	13x18	13x18	.....	.....
Width front flange, in.	**2½**	**2½**	**2½**	**2½**	**2½**	**1½**	1½	1½	.....	.....
Front plate Expanslip joint	Not Required		**Yes**	**Yes**	**Yes**	**Yes**	Yes	Yes	.....	.....
Back rail Expanslip joint	Not Required					**Yes**	Yes	Yes	.....	.....
Appx. shipping weight, lbs.	**24**	**27**	**30**	**33**	**35**	**42**	50	57	.....	.....
Series 36-in.										
Maximum size of opening, in.	.....	.....	31x36	34x36	37x36	43x36	**49x36**	**55x36**	61x36	73x36
Proper flue tile size, in.	.....	.....	13x13	13x13	13x13	13x18	**13x18**	**13x18**	18x18	18x18
Appx. shipping weight, lbs.	.....	.....	32	35	38	45	**54**	**60**	66	72
Series 42-in.										
Maximum size of opening, in.	.....	.....	.....	.....	37x42	43x42	49x42	55x42	**61x42**	**73x42**
Proper flue tile size, in.	.....	.....	.....	.....	13x13	13x18	13x18	18x18	**18x18**	**18x18**
Appx. shipping weight, lbs.	.....	.....	.....	.....	54	63	72	81	**90**	**110**

All Series 36 and 42 in. have front and back Expanslip joints, and 1½ in. front flanges. *Bold face type* shows sizes which are shipped when Series is not specified. Sizes other than shown in bold face are carried at Norwich, N. Y., only (and are F.O.B. that point).

OTHER PRODUCTS

Ash Dumps

Deep Seat—The heaviest, most permanent dump made. Twice standard weight. Deep 2⅛-in. seating flanges make trap stay in place. Size 9x6 ins.

Standard—A good quality cast iron dump in 7x5-in. size.

Cleanout Doors

Hopper type doors of fabricated steel. No breakage. Sizes 8x8, 10x8, 12x10 in.

Lintel Bars

Structural steel angles with proper section and extra length for footing for any width opening.

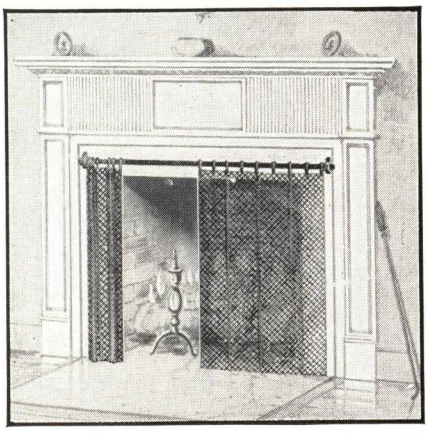
Fireplace Cranes

Hand wrought in various old time designs.

Basket Grates

For coal or wood.

It is convenient to have these items delivered on the job with the unit or damper.


Flexscreen

Flexscreen—Flexible Spark Curtains

The Flexscreen consists of flexibly woven wire curtains sliding or rolling on a bar attached to the fireplace. This style of fireplace screen is rapidly replacing other styles because of its beauty, convenience and complete protection.

Sizes—Any size of fireplace may be equipped regardless of proportions or shape.

Designs—Many attractive styles are offered for mounting on the face of the mantel or below the lintel.

Finishes—Satin black, polished brass, Swedish iron and the white metals are standards, but any sample can be matched.

Our local representative will give suggestions on any installation, or we will send complete specifications.

COLONIAL FIREPLACE COMPANY

TELEPHONE
Lawndale 0140

4644 West Roosevelt Road
CHICAGO, ILL.

TELEPHONE
Cicero 143

Products

The IMPROVED COLONIAL DAMPER for Fireplaces.

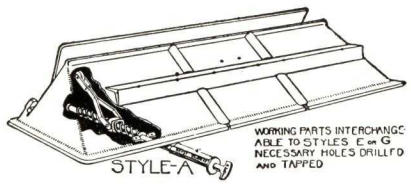
The Glo-Hot Electric Fireplace Heating Grate; the Victor Electric Fireplace Heater; Genuine and Artificial Fireplaces; Period Wood Mantels, Fireplace Furnishings and Accessories.

Colonial Damper

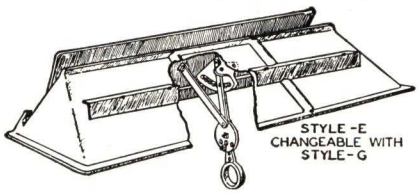
3 Styles—12 Sizes
Operating Controls Interchangeable

Colonial Damper "Has No Equal"

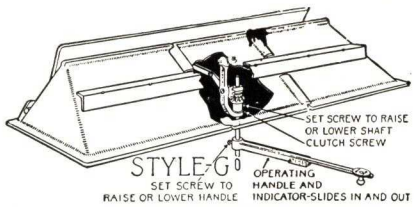
The only damper made to take up heat expansion. Built in sections of best gray iron castings —no sheet iron. The sections are securely bolted together. Overlapping joints absorb expansion of the hottest fires and subsequent contraction. This avoids cracking fireplace facings and is covered by U. S. patent. Reinforced by steel angle bar; sustains great weight and intense heat.



Screw Control—Through Face of Fireplace



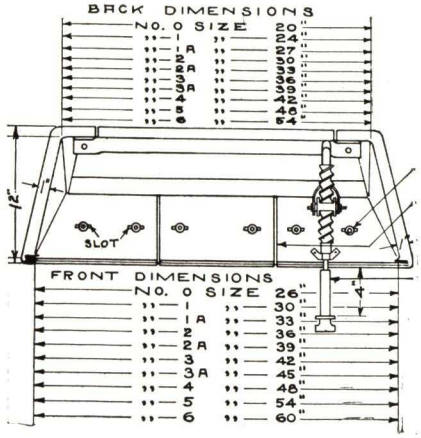
Poker Control—Through Adjustable Ring



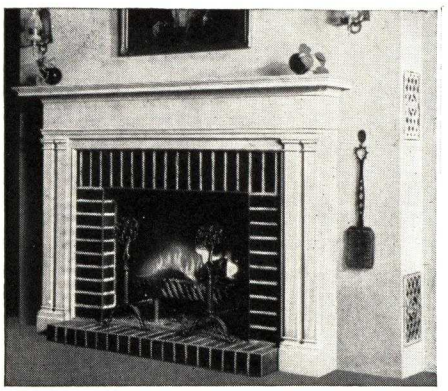
Lever Control—Out of Sight but Easy to Reach

Colonial Damper Is "Standard"

The reinforcing steel angle bar sets halfway up the sloping front of the damper throat. The ledge which it forms furnishes a footing on which to build the common brick backing and on which to anchor the facing. The Colonial Damper can be set in two minutes either front or back, or one, two or more courses above the opening. Only damper with which this is possible. Avoids smoking; permits checking fire low. Compels correct formation of the fireplace throat. A mason experienced in fireplace building will spend much more time in forming the throat, the vital part of the fireplace, than the whole cost of the Colonial Damper. Hence it is standard in most specifications.



Period Wood Mantels
Send for catalog



Superior Heat Circulator Fireplace Unit

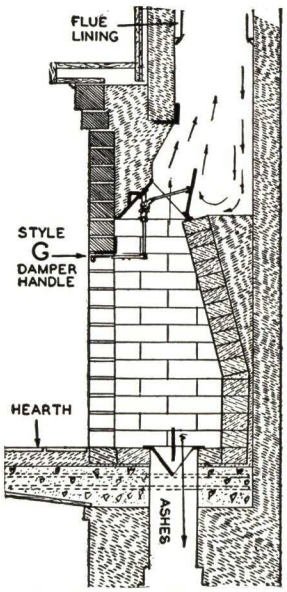
SIZES OF COLONIAL DAMPER, STYLES A, E AND G

No.	Code word	Width of fireplace opening, in.	Proper size of flue, in.	Weight, crated singly, lb.
00	Count	20 to 23	8x8	30
0	Duke	24 to 28	8x8	35
1	Prince	29 to 32	8x12	40
1-A	Valet	33 to 35	8x12	43
2	Regent	36 to 38	8x16	48
2-A	Butler	39 to 41	8x16	51
3	Queen	42 to 44	8x16	53
3-A	Page	45 to 47	12x12	57
4	King	48 to 51	12x12	63
5	Rex	52 to 57	12x16	68
6	Czar	58 to 64	12x16	75
7	Earl	66 to 72	16x16	90

Style A regularly furnished on above code words.
Style E furnished upon adding "universal" to code word.
Style G furnished upon adding "swing" to code word.

Service to Architects

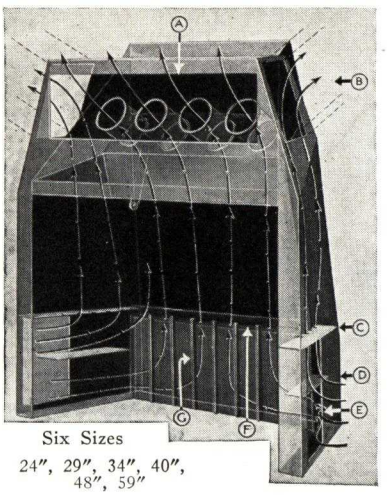
Ask for Fireplace blueprint details "How to Avoid Mistakes in Fireplace Construction."



Superior Heat Circulator

Superior Features

(A) Front warm air outlet, also showing air flues connecting lower back wall with upper heating chamber.
(B) Side outlets may open into living room or other rooms adjacent to fireplace or carried to second floor.
(C) Reinforcing and baffle plate welded to inner lining.
(D) Reinforcing plate welded to inner lining.
(E) Air intake at floor level.
(F) Double thickness of iron prevents expansion and contraction from breaking at bended back.
(G) Reinforcing "T" irons provide air space between fire and back wall, preventing overheating, warping and scaling.



Six Sizes
24", 29", 34", 40", 48", 59"

Send for Detailed Blueprint

Literature Available for Your Files

Detailed Blue Print
Colonial Dampers

Detailed Blue Print
Superior Heat Circulator

Period Wood Mantels

Andirons — Firesets — Screens — Grates

Hand Wrought Furnishings — Catalog No. 24.

Special Furnishings Made to Order.

THE H. W. COVERT COMPANY

Manufacturers of Fireplace Specialties Since 1896

229 East 37th Street, NEW YORK, N. Y.

For Covert Floor Drains and Scuppers, see File Index

The durable and satisfactory quality of Covert Fireplace Equipment is the secret of the reputation and standing of THE H. W. COVERT COMPANY among those who have any connection with the building industry. Established in 1896, the business is now conducted by the sons of the founder. They are maintaining the standards set by their father, and constantly striving to preserve the trust placed in them and in Covert products by architects, home owners, dealers, contractors and masons throughout the country whose reputations depend on satisfactory fireplace installations.

COVERT FIREPLACE DAMPERS

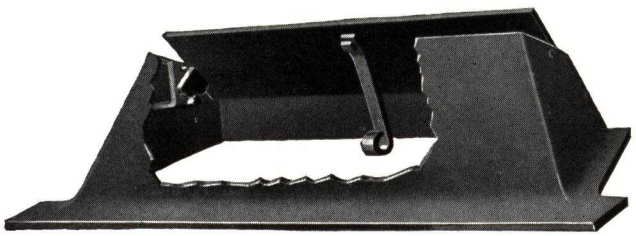
COVERT "IMPROVED" FIREPLACE DAMPER

"Improved" Damper
Series D and E

This type is very efficient due to its curved front and wide unobstructed smoke opening. Inrushing air follows the curved front up into the smoke chamber with a minimum of resistance.

The ratchet handle, operated from underneath the arch at the center of the fireplace, provides for five adjustments of the damper plate. Operating mechanism is simple and dependable and the valve plate is easily removed during construction or for removing accumulations of soot. Used in fireplaces 20 in. or less in depth at the hearth.

COVERT "OLD STYLE" DAMPER



"Old-Style" Damper Series A, B, C and F

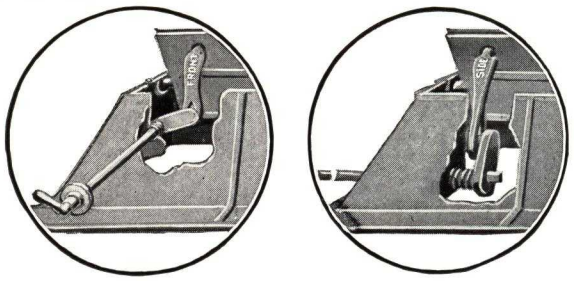
This type is preferred by many architects, especially for use in large and deep fireplaces.

Made in four series, 9, 10, 12 and 16 in. deep in the base opening, of extra heavy construction.

Damper plate, operated by a lever reached with a poker, is adjustable to three positions: open, closed and half closed. May also be furnished with chains and indicators if damper is set above arch level.

COVERT "ROTARY" FACE OR SIDE CONTROL DAMPER

This type is used where it is desirable to operate the plate from the face or side of the fireplace by a brass handle.



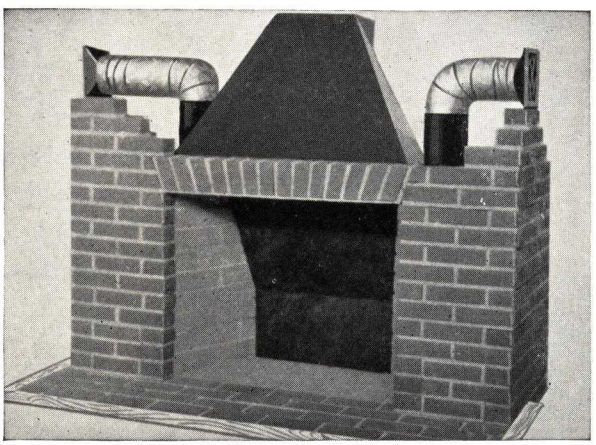
Covert Rotary "Face or Side Control" Damper

Avoiding the usual worm gear (which is likely to become clogged by accumulation of soot) this damper makes use of a simple crank movement that can be arranged to operate either from the face or side of the fireplace with the mechanism accompanying each damper.

COVERT STEEL SMOKE CHAMBER

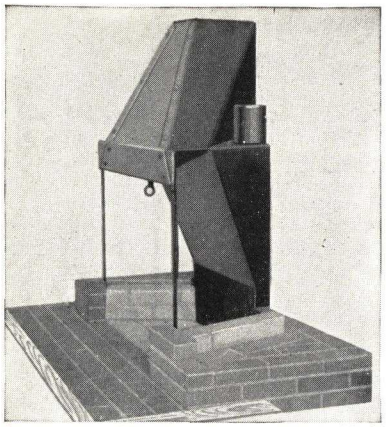
This important part of the fireplace should be of smooth construction, with proper capacity and with a centered flue. Such construction is assured by the use of the Covert Steel Smoke Chamber at a considerable savings in mason's time.

COVERT RADIHEATER FIREPLACE

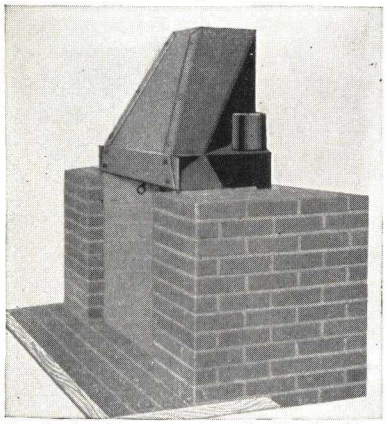


For maximum heating efficiency, Covert Radiheater Fireplace is recommended. This welded steel form not only provides three or four times the heat of the ordinary fireplace but precludes possibility of faulty construction.

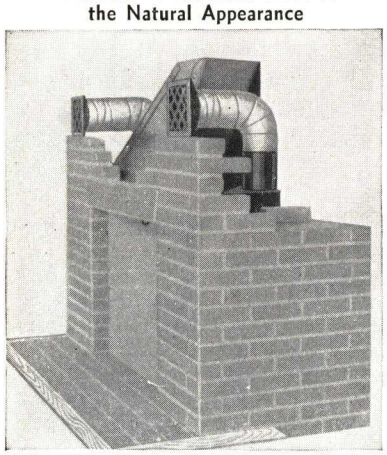
Detailed Information on Following Pages



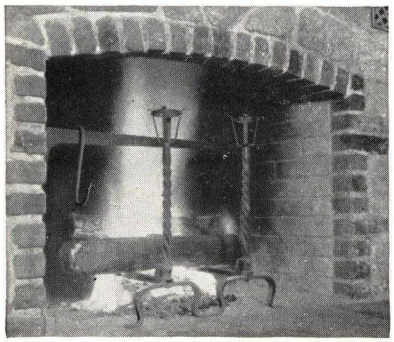
Air Heating Chamber, Damper, Wind Shelf and Smoke Chamber Welded Into a Complete Unit



Simple for Mason to Install. No Smoking Assured. Brick Sides Preserve the Natural Appearance



Adjustable Piping Simplifies Installation and Increases Efficiency



Actual Fireplace Showing Concentration of Heat at Center of Wall

Covert Radiheater Fireplace

The knowledge of forty years experience in fireplace construction is incorporated in the design of Radiheater to correct three defects of the ordinary brick fireplace.

First—To prevent the common faults which cause many fireplaces to smoke—by furnishing the mason with a scientifically designed form around which the conventional brick or stone fireplace is built—insurance against possible failure.

Second—To convert the heat ordinarily lost by absorption in the brickwork of the back lining into a steady stream of convected warm air flowing to all parts of the room and adjoining rooms.

Third—To secure an adequate supply of air for combustion and circulation. The trend in home building being toward insulated and airtight construction, infiltration of air is reduced to a minimum. Radiheater fits admirably into this type of construction in that provision is made for the introduction of an independent supply of air to replace the large volume of air exhausted up the flue.

How Radiheater Functions

Radiheater consists of a heating chamber forming the rear wall of the fireplace, a four-sided smoke chamber, wind shelf and adjustable throat damper.

Fresh air is conveyed into the lower part of the heating chamber through an opening in the masonry at the rear of the unit. This air is heated by contact with the hot metal back and flanges and delivered into the room through pipes and grills. In the case of an inside chimney, air is drawn from the room in back of the chimney or from the cellar or through a duct along the cellar ceiling to the outside air.

Why Radiheater Is So Efficient

When the usual type fireplace is burning, air required for combustion is carried up the flue, not slowly, but with sufficient velocity to completely exhaust a room of ordinary size several times per hour. This replacement air is drawn through cracks in doors and windows at *outside* temperature, causing cold drafts towards the fireplace and chilling the room, except in the immediate vicinity of the fireplace. With Radiheater, however, the suction created by the exhausting of air up the flue is used to draw into the room a supply of fresh, heated air.

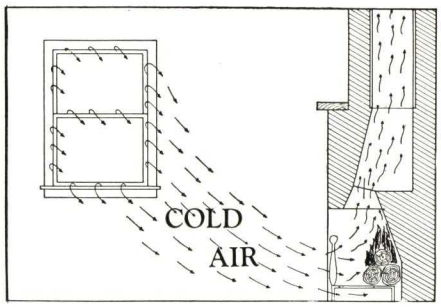
(Many inspections of smoky fireplaces by our service department have disclosed correct masonry construction, but weatherstripped doors and windows prevent the infiltration of adequate air to replace that exhausted by the flue. The partial vacuum thus created has drawn smoke down the flue and rendered the fireplace unusable, except by opening a door or window.)

Preserves Natural Appearance of Fireplace

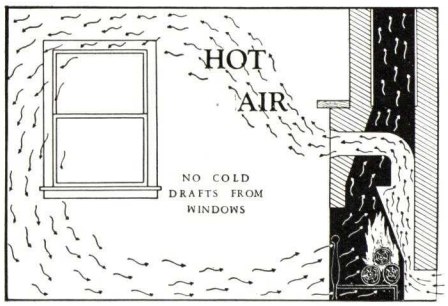
Radiheater takes advantage of the heat-producing flames concentrated in the center of the back wall, permitting the fireplace to be built with the customary brick sides to preserve the conventional appearance and charm of the fireplace.

Flanges Amplify Heat

Flanges welded to the metal back within the heating chamber at the point of greatest heat, provide increased air heating surfaces. These welded flanges result in a given amount of fuel heating a greater amount of air and heating it more quickly.



Air Exhausted Up the Flue in Ordinary Fireplaces Draws Cold Air Through Cracks in Doors and Windows



Radiheater Fireplace Utilizes Suction of Air Carried Up the Flue to Draw a Supply of Fresh Heated Air into Room

Stove Pipe Outlets Increase Efficiency and Simplify Construction

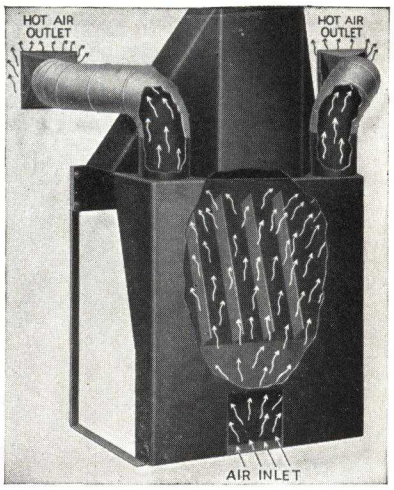
To further speed up the flow of heated air into the room, the furnishing of telescoping pipe with adjustable elbow connections enables the mason to quickly form a smooth, efficient air duct from the heating chamber to the outlet grills.

Sturdy Construction—Provision for Expansion of Metal

Lower section of the fire-back, being subjected to the greatest heat, is made of ¼-in. boiler plate. Upper section of the back is ⅜-in. boiler plate. Damper plate and wind shelf are 12-gauge and other parts 14-gauge rust-resisting steel. Provision for expansion of metal has been taken care of in the construction of the unit.

Remarkable Results Reported by Owners

Radiheater is proving its efficiency in hundreds of summer camps and year-round homes throughout the country. Owners of Southern homes report adequate heat from the Radiheater Fireplace without additional heating equipment. Northern home owners welcome its extra fireplace heat during late spring and early fall and the auxiliary heat in the colder months. In air-conditioned homes, Radiheater's "balanced ventilation" feature reduces interference to the air-circulating system caused by the exhaustion of air up the flue when the fireplace is in operation.



View from Back

Showing heat circulating system and radiator-like flanges welded to the hottest part of the back, increasing the amount of convected hot air

Combination Grills and Shut Off Dampers for Hot Air Outlets

No. 1—8x8 in. No. 2—8x8 in. No. 3—8x8 in.

Each cast iron grill is secured to a frame terminating in a round hub over which the hot air pipe fits. In this frame is a shut off damper controlled by a small push handle. May be installed in front, side or above mantel.

Screened Fresh Air Intake Grill

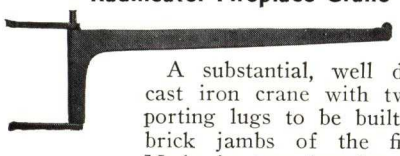
This louvre grill is made of heavy cast iron with anchors and copper screen to exclude flies and other insects. Size 8x8 in.

Hot Air Pipe Connections

For the ordinary installation having the hot air outlet grills placed below the mantel height, two 6 in. adjustable elbows and one 4 to 8 in. telescoping length of 6 in. pipe will be required for each outlet, giving a maximum pipe length of 27 in. from center of outlet on unit to center of grill. A complete set comprises four elbows and two telescoping lengths.

When the outlet grills are placed higher than the mantel height, or run to other rooms, additional 6 in. diameter, 26-gauge galvanized pipe may be secured by the local mason.

Radiheater Fireplace Crane



A substantial, well designed cast iron crane with two supporting lugs to be built in the brick jambs of the fireplace. Made in two lengths, 24 and 29 in.

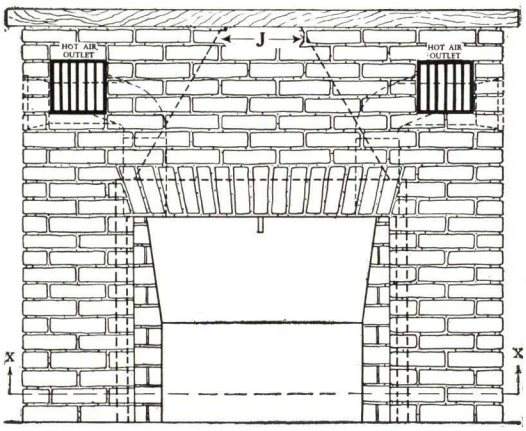
Specification

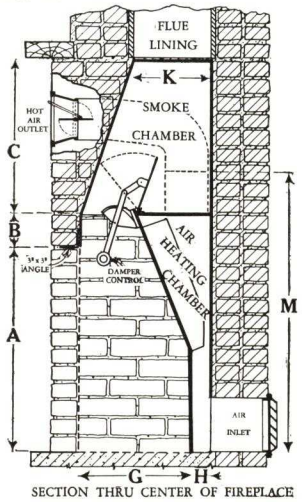
The mason is to furnish and install in the fireplace a Covert Radiheater Unit, No. ——, complete with two hot air grills No. ——, one complete set hot air piping and one fresh air intake grill.

The mason is to build in the unit according to the instructions of The H. W. Covert Company, 229 East 37th Street, New York, N. Y.

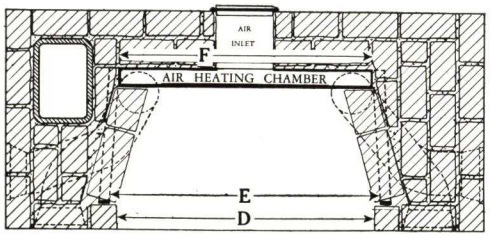
Service

We will gladly co-operate with architects in the working out of installation methods.

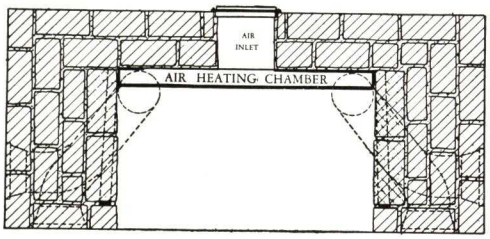




SECTION THRU CENTER OF FIREPLACE



Plan at XX Splayed Jambs



Plan at XX Square Jambs

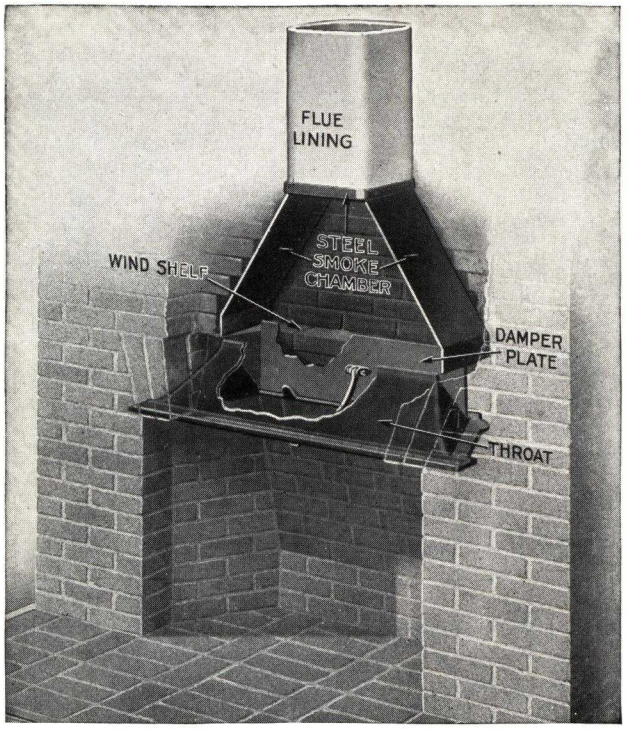
Square fireplace sides, as shown above, are recommended as they permit burning of longer logs and expose greater surface of the air heating chamber to flames. In laying out fireplace with square sides, maximum finished fireplace openings should be as follows:

RA 34.....30 in. RA 39.....36 in.
RA 44.....42 in. RA 50.....48 in.

DIMENSIONS OF RADIHEATER UNITS (IN INCHES)

	No. RA34	No. RA39	No. RA44	No. RA50
A	27½	29½	30	31
B	5½	6	6	6
C	16½	21	26½	27
D	33	37	42	48
E	34	39	44	50
F	30	36	42	48
G	15	15½	16	17
H	2½	3	3	3½
J	11¼	11¼	11¼	16½
K	8	11¼	11¼	11¼
M	41	44	45	46
Flue Size	8½x13	13x13	13x13	13x18

Damper Details on Following Pages



Installation Showing "Improved" Damper and Steel Smoke Chamber

Specifications

Furnish for each fireplace a Covert ("Old Style", "Improved" or "Rotary") damper and Steel Smoke Chamber.

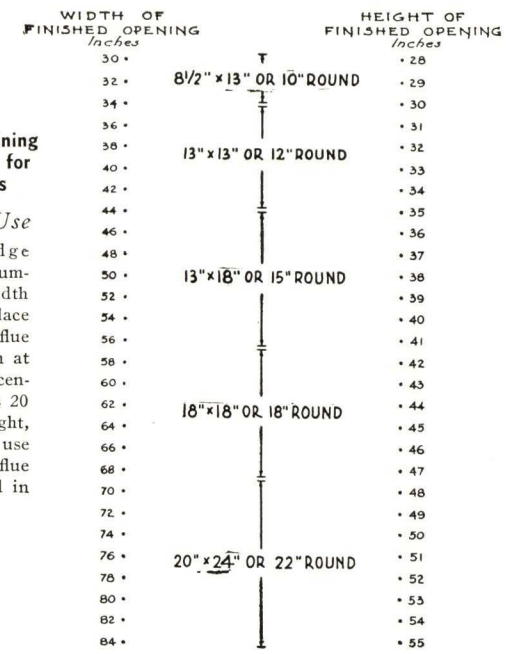
In carrying up the flues, follow up each length of flue-lining with a bag filled with hay or shavings completely closing the flue, to prevent the clogging of the flue by mortar droppings.

The contractor shall consult with THE H. W. COVERT COMPANY regarding the proper selection of dampers, etc., to meet the conditions of these fireplaces and to secure the best results.

Chart for Determining Proper Flue Sizes for Open Fireplaces

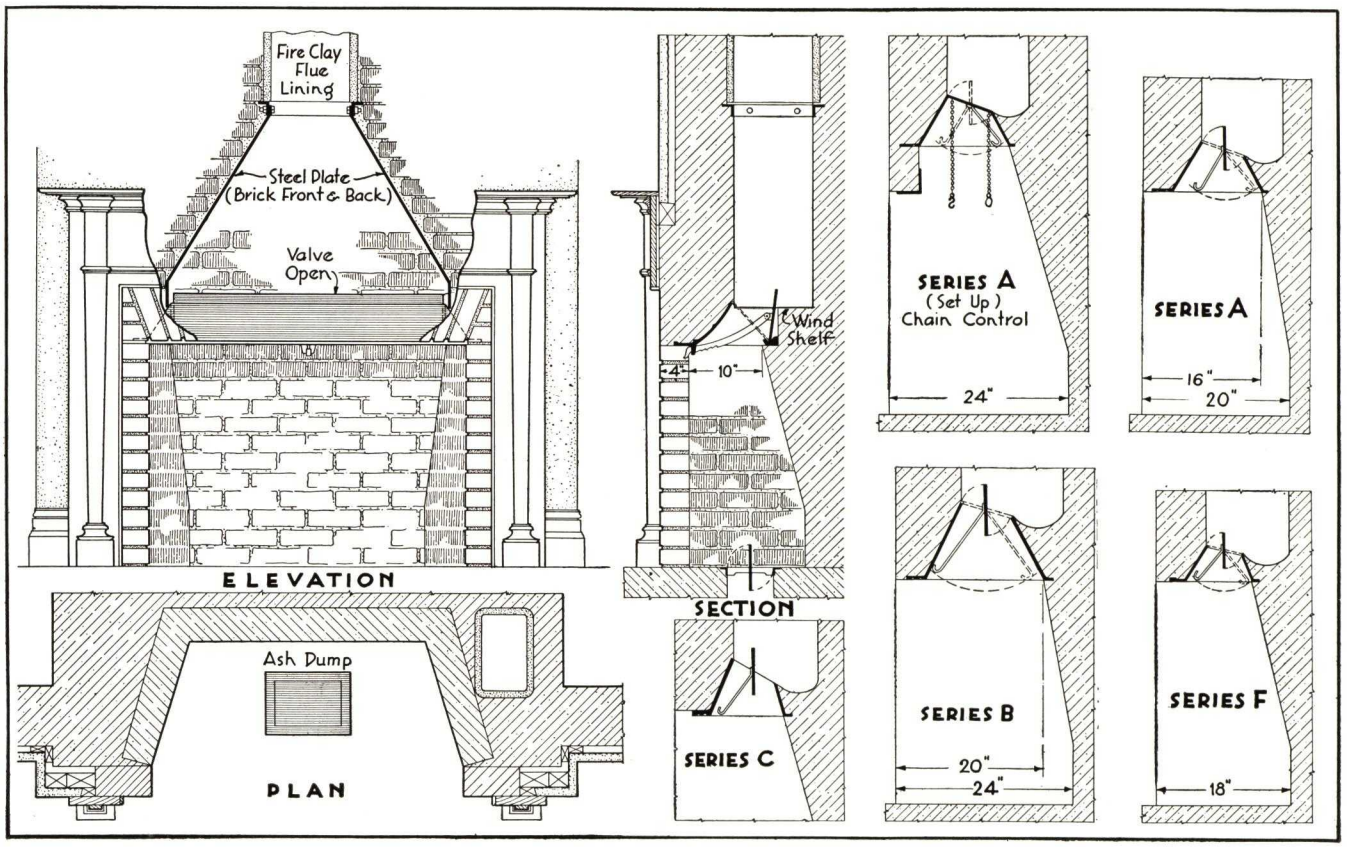
Directions for Use

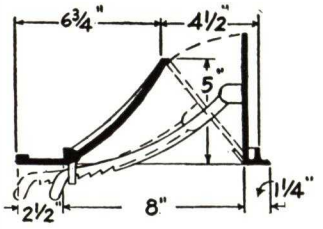
Lay straightedge through dots at numbers indicating width and height of fireplace opening. Proper flue sizes will be shown at intersection with center line. If flue is 20 ft. or less in height, it is advisable to use next larger size flue than that indicated in table.



DIMENSIONS OF STANDARD FIRE CLAY FLUE LINING

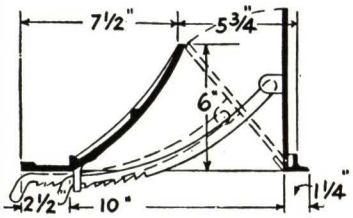
Outside, ins.	Inside, ins.	Inside area, sq. in.	Inside, ins.	Outside, ins.	Inside area, sq. in.
Square and Rectangular Flue			Round Flue		
8½ x 8½	7¼ x 7¼	52.56	8 (diam.)	9½	50.26
8½ x 13	7 x 11½	80.5	10 (diam.)	11¾	78.54
8½ x 18	6¾ x 16¼	109.69	12 (diam.)	14	113.0
13 x 13	11¼ x 11¼	126.56	15 (diam.)	17¼	176.7
13 x 18	11¼ x 16¼	182.84	18 (diam.)	20½	254.4
18 x 18	15¾ x 15¾	248.06	20 (diam.)	22¾	314.1
20 x 20	17¼ x 17¼	297.56	22 (diam.)	25⅛	380.13
20 x 24	17 x 21	357.0	24 (diam.)	27¼	452.3
24 x 24	21 x 21	441.0			





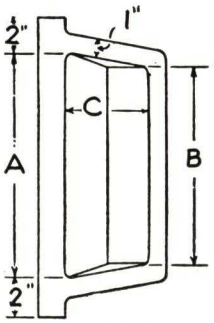
IMPROVED SERIES D

DAMPER NUMBER	FRONT WIDTH OF FIREPLACE OPENING IN INCHES	BASE OPENING OF THROAT IN INCHES		
		A	B	C
424	24	24	18	8
430	30	30	24	8
432	32	32	26	8
436	36	36	30	8
442	42	42	36	8
448	48	48	42	8
454	54	54	48	8
460	60	60	54	8



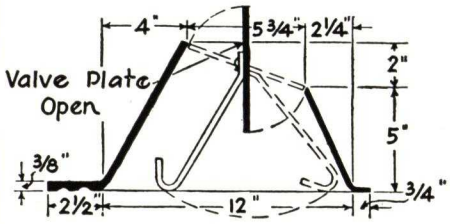
IMPROVED SERIES E

DAMPER NO.	BRICK OPENING	A	B	C
524	24	24	18	10
530	30	30	24	10
532	32	32	26	10
536	36	36	30	10
542	42	42	36	10
548	48	48	42	10
554	54	54	48	10
560	60	60	54	10



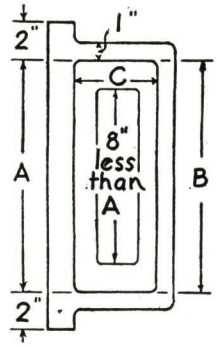
KEY PLAN OF SERIES D & E

FOR FLUE SIZES SEE CHART ON PREVIOUS PAGE.
SMOKE CHAMBERS TO MATCH FLUE SIZES FURNISHED WHEN SPECIFIED



OLD STYLE SERIES A

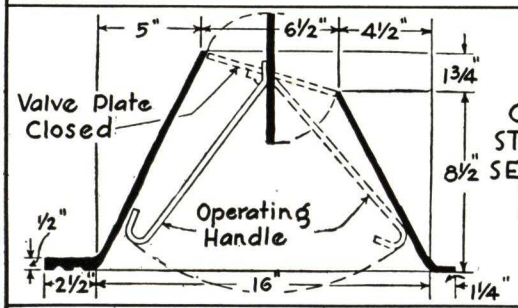
DAMPER NO.	BRICK OPENING	A	B	C
224	24	24	24	12
230	30	30	30	12
232	32	32	32	12
236	36	36	36	12
242	42	42	42	12
248	48	48	48	12
254	54	54	54	12
260	60	60	60	12
272	72	72	72	12



KEY PLAN OF SERIES A & B

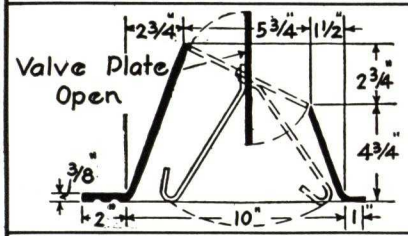
FOR FLUE SIZES SEE CHART ON PREVIOUS PAGE

SMOKE CHAMBERS TO MATCH FLUE SIZES FURNISHED WHEN SPECIFIED



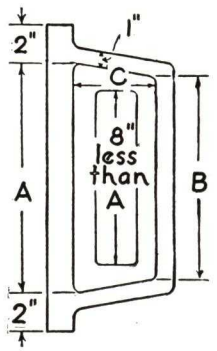
OLD STYLE SERIES B

DAMPER NO.	BRICK OPENING	A	B	C
36½	36	36	36	16
42½	42	42	42	16
48½	48	48	48	16
54½	54	54	54	16
60½	60	60	60	16
72½	72	72	72	16
84½	84	84	84	16



OLD STYLE SERIES C

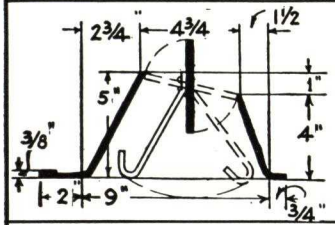
DAMPER NO.	BRICK OPENING	A	B	C
30	30	30	24	10
36	36	36	30	10
42	42	42	36	10
48	48	48	42	10



KEY PLAN OF SERIES C, F AND FACE OR SIDE CONTROL

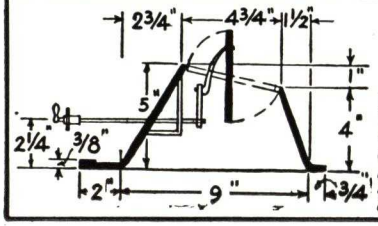
FOR FLUE SIZES SEE CHART ON PREVIOUS PAGE.

SMOKE CHAMBERS TO MATCH FLUE SIZES FURNISHED WHEN SPECIFIED



OLD STYLE SERIES F

DAMPER NO.	BRICK OPENING	A	B	C
724	24	24	18	9
730	30	30	24	9
732	32	32	26	9
736	36	36	30	9
742	42	42	36	9
748	48	48	42	9



FACE OR SIDE CONTROL DAMPER

NOTE: A Shaft 24" in length is provided with each face or side control damper so that it may be connected to operate thru side of fireplace if front operation is not desired.

DAMPER NO.	BRICK OPENING	A	B	C
624	24	24	18	9
630	30	30	24	9
632	32	32	26	9
636	36	36	30	9
642	42	42	36	9
648	48	48	42	9

MEMORANDA

DONLEY DEVICES

THE DONLEY BROTHERS CO. • CLEVELAND • OHIO

Donley Fireplace Equipment and Building Specialties

SUCCESSFUL FIREPLACES

A Successful Fireplace is not a matter of chance but the result of careful study and planning. The Donley "Book of Successful Fireplaces" now in its Seventh Edition is a brochure of sixy-four pages of interesting notes on fireplace history with illustrations, fireplace planning and building, portfolio of fireplace designs, outdoor fireplaces and much other helpful information on the subject. It contains the results of their quarter century of study and experience in design and construction of fireplaces and the production of fittings and equipment to insure complete fireplace satisfaction. Pioneers in the field Donley is today the recognized authority and fireplaces built to their plans and specifications with Donley fittings and equipment will not smoke and will give lasting satisfaction and pleasure.

DONLEY DEVICES Complete the Home

This Catalog contains the details on Donley Devices of interest and value to the architect. The Donley Catalog of 44 pages contains more details and describes other items. Sent on request.

Donley Heatsaver Fireplace Unit

The Donley Heatsaver is an improved metal fireplace unit, consisting of substantial, metal fire and smoke chambers, surrounded at three sides and top by an air chamber, through which air circulates, is warmed and from which it is discharged by means of outlet grilles.

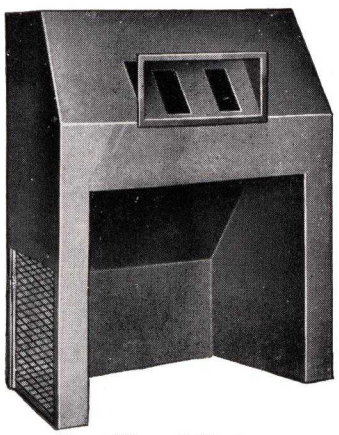
Constructed for long life, the metal plates in contact with the fire are $\frac{3}{16}$ in. thick, with a smoke shelf $\frac{1}{4}$ in. thick. Casing, designed to be pierced for outlet pipes is No. 26 gauge steel. Steel mesh excludes vermin from inlet openings. A throat damper, designed for poker control, is integral with the unit. Designed by experts and made to exact specifications perfect draft is assured with no danger of a smoky fireplace due to careless workmanship.

Circulates Maximum Heat—Besides assuring a correctly proportioned fireplace interior, the Heatsaver provides a generous flow of heated air, saving heat that would otherwise be absorbed in masonry or pass up the chimney. This saving is promoted by utilizing the maximum area of heated surface, including that of the smoke chamber as illustrated on opposite page in diagram and first table. Air ducts passing upward through the smoke shelf and discharging from a central outlet add greatly to the heating efficiency. Where central outlet is not desired it is closed off before shipment and heat passes through upper outlets, which should be proportionately increased in size.

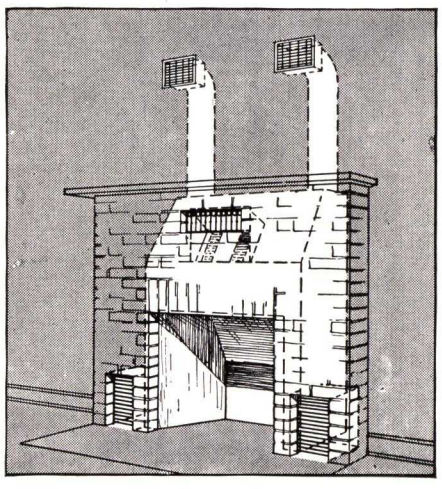
Convection Sheet System—An exclusive Donley feature. The convection sheets promote heat saving, increasing the discharge by twenty per cent as shown by test. They keep outer casing always cool enough to touch and make unnecessary the use of an insulating blanket.

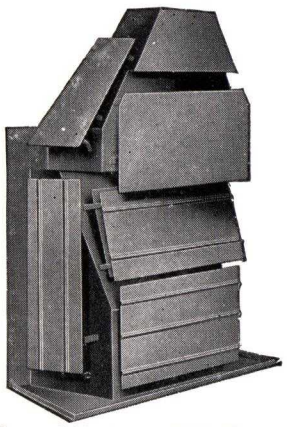
Air Flow Is Ample—Correctly proportioned with ample inlets and outlets, assures free flow of air. Plates in direct contact with fire are reinforced with heat-dissipating fins. These fins, together with tubes leading from underside of smoke shelf through the smoke chamber, are important factors for heat salvage and for long life of the unit.

Has Wide Usefulness—The Heatsaver is a sufficient heating system for many cottages, small homes or homes in mild climates. Buildings with central heating find it a welcome auxiliary. In churches, clubs, etc., it heats a single office or committee room, without expense of firing the boiler.



Front View of Heatsaver





Rear of Heatsaver With Casing Removed Showing Systems of Convection Sheets

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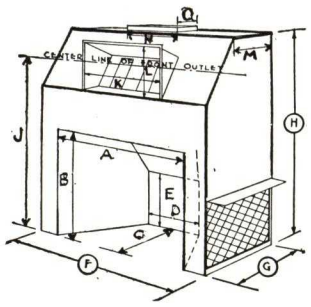
Donley Heatsaver Fireplace Unit

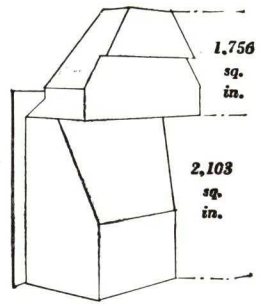
B.T.U. OUTPUT OF HEATSAVER UNITS



Heatsaver No.	Heated surface in square inches			B.t.u. delivered, per hour
	Below smoke chamber	Above smoke chamber	Total	
No. 26	1661	1238	2899	12900
No. 30	1927	1654	3581	18600
No. 34	2103	1756	3859	19800
No. 42	2671	2569	5240	24040
No. 48	2949	2965	5914	26700
No. 60	3763	5868	9631	39300

DIMENSIONS OF HEATSAVER UNITS

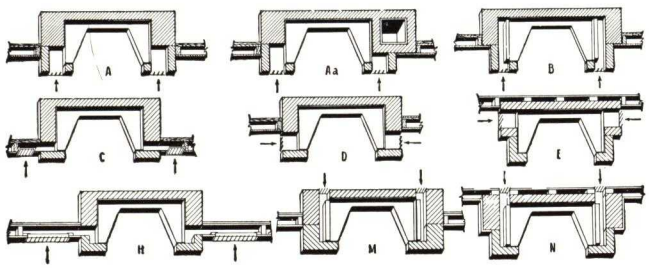
Heat saver No.	Opening dimensions in inches					Casing dimensions in inches									Shipping wt.
	A	B	C	D	E	F	G	H	J	K	L	M	N	O	
26	26	24	17	11 3/4	14	33	21	48	40 1/8	8	12	11 3/4	7 1/4	7 1/4	280
30	30	28	17	15 7/8	14	38	21	55	45 1/8	16	12	11 3/4	11 1/4	7 1/4	320
34	34	28	17	20	14	42	21	55	45 1/8	16	12	11 3/4	11 1/4	7 1/4	355
42	42	30	18	27	14	50	22	62	47 1/8	16	12	16	11 1/4	11 1/4	450
48	48	30	18	33	14	58	22	62	47 1/8	25 1/2	12	16	11 1/4	11 1/4	510
60	60	34	20	43 3/8	16	72	26	80	56	25 1/2	12	16	15 3/4	11 1/4	931



Showing Heat Saving Through Utilizing Upper Surfaces
Figures are for No. 34 Unit

AIR INLET ARRANGEMENTS

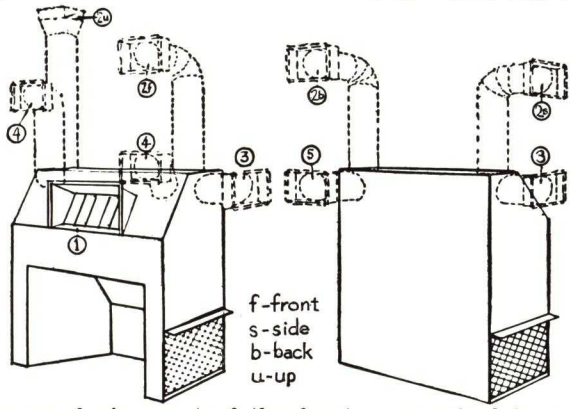
Of the nine plans below, Plans A, Aa, B, C, and D have been most favored by users. If provision is to be made for a cold air filter, access must be provided for occasional filter changes. Plans B and H below are so



arranged. Plans M and N can easily be adapted by making the inlet grilles removable and providing guides for sliding the filter. To adapt Models A, Aa, C or D, access would have to be arranged from the back and masonry built to allow space for filter.

ARRANGEMENT OF WARM AIR OUTLETS

Composite diagram below shows how warm air outlets may take off from the Heatsaver casing—from top, back,



sides or sloping part of the front, as required by architect's design. Casing is pierced for the purpose as in furnace practice.

The Heatsaver is regularly supplied for use of center outlet. If it is to be omitted order should so state and the change made at factory.

TABLE OF COLD AIR INLET GRILLES (Over-all Size)

Heat Saver No.	Number 55		Number 65-L		No. 57	Filters (Optional)
	Installed Like A, C, D or E	Installed Like B, M or N	Installed Like A, C D or E	Installed Like B, M or N	Installed Like H	
26	2 9 x 13	2 6 x 21	2 9 x 11	2 6 x 17	2 21 3/4 x 17 3/4	2 16 x 20
30	2 9 x 15	2 6 x 25	2 9 x 13	2 6 x 22	2 21 3/4 x 21 3/4	2 20 x 20
34	2 9 x 15	2 6 x 25	2 9 x 13	2 6 x 22	2 21 3/4 x 21 3/4	2 20 x 20
42	2 9 x 19	2 6 x 31	2 9 x 17	2 6 x 25 3/4	2 21 3/4 x 26 3/4	2 20 x 25
48	2 9 x 19	2 6 x 31	2 9 x 17	2 6 x 25 3/4	2 21 3/4 x 26 3/4	2 20 x 25
60	2 9 x 19	2 6 x 31	2 9 x 17	2 6 x 25 3/4	2 21 3/4 x 26 3/4	2 20 x 25

SIZES OF DUCTS AND STANDARD REGISTER BOXES FOR WARM AIR OUTLETS

Ordinarily 3 warm air outlets are used. If one, the lower center outlet is omitted because of mantel design, the 2 upper outlets are increased in size.

TABLE OF WARM AIR OUTLET GRILLES (Over-all Size)

Two center outlet grilles are shown, of which No. 60 is of simple ornamental design, and No. 65 a plain, cast iron grid. If center outlet is omitted, other outlets must be increased as indicated in last two columns of the table.

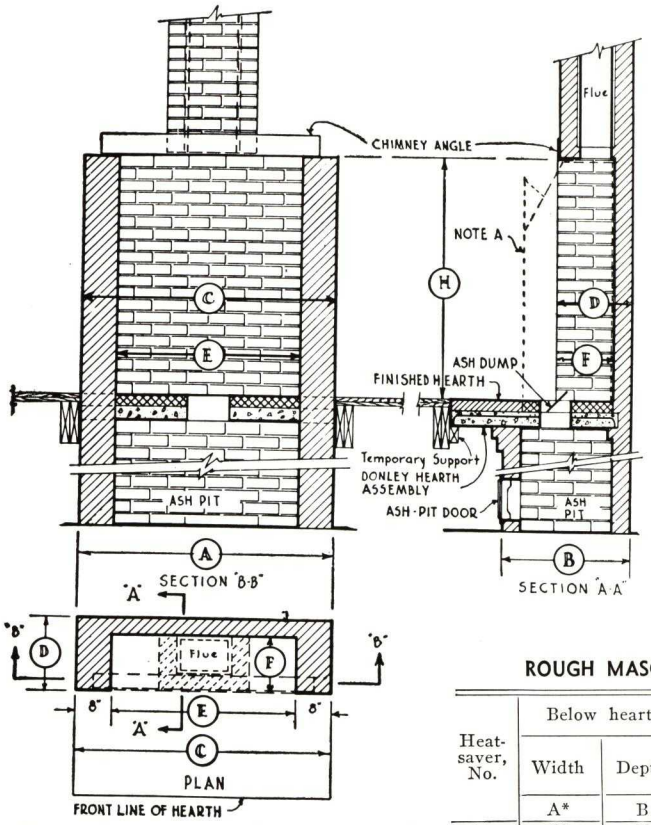
Heat Saver No.	For Center Outlet		For Upper Outlets			
	No. 60	No. 65	No. 53	No. 65	No. 53 If Center Outlet is Omitted	No. 65 If Center Outlet is Omitted
26	1 8 x 6	1- 8x6 or 1-12x4	2 11 x 9	2 8 x 8	2 11 x 9	2 12 x 8
30	1 16 x 6	1-16x6 or 1-12x8	2 11 x 9	2 8 x 8	2 13 x 10	2 12 x 10
34	1 16 x 6	1-16x6 or 1-12x8	2 11 x 9	2 8 x 8	2 13 x 10	2 12 x 10
42	1 16 x 6	1-16x6 or 1-12x8	2 13 x 10	2 12 x 8	2 15 x 11	2 12 x 12
48	1 24 x 6	1-23x6 or 1-16x8	2 13 x 10	2 12 x 8	2 15 x 11	2 12 x 12
60	1 24 x 6	1-23x6 or 1-16x8	2 13 x 10	2 12 x 8	2 15 x 11	2 12 x 12

Note: Grilles 55, 53 and 57 are steel, others are cast iron.

Heatsaver No.	When using 3 outlets, including center outlet		If center outlet is omitted using two upper outlets only	
	Standard Register Box	*Pipe Size (r'd) in.	Standard Register Box	*Pipe Size (r'd) in.
26	8x10	8	8x10	8
30	8x10	8	9x12	9
34	8x10	8	9x12	10
42	9x12	9	10x14	10
48	9x12	9	10x14	10
60	9x12	9	10x14	10

*For Upper Outlets

Heatsaver Installation Data



Notes: *Add 10 in. if air filters are used at sides of unit.

†This measurement is 1 in. more than size of unit. Center of flue should be directly above center of dimension.

‡This steel angle above unit supports the front side of chimney.

Floor plan must first be determined in accordance with projection of fireplace into the room, also the presence of adjoining flues, both factors influencing the arrangement of cold air inlets. Nine suggested floor plans are shown on the preceding page.

Diagram of rough masonry should be carefully studied in connection with table of rough masonry dimensions for various sizes of unit. Heatsaver is backed into the rough masonry into position indicated by dotted line. Front of chimney rests on a steel angle, set about one inch higher than the size of Heatsaver used. When unit is in place, the cast iron flue collar is lifted into position and the joint filled with mortar to seal.

Cold Air Inlet Grille is selected by consulting table at bottom of preceding page. Nos. 55 and 57 are of steel and No. 65L of cast iron.

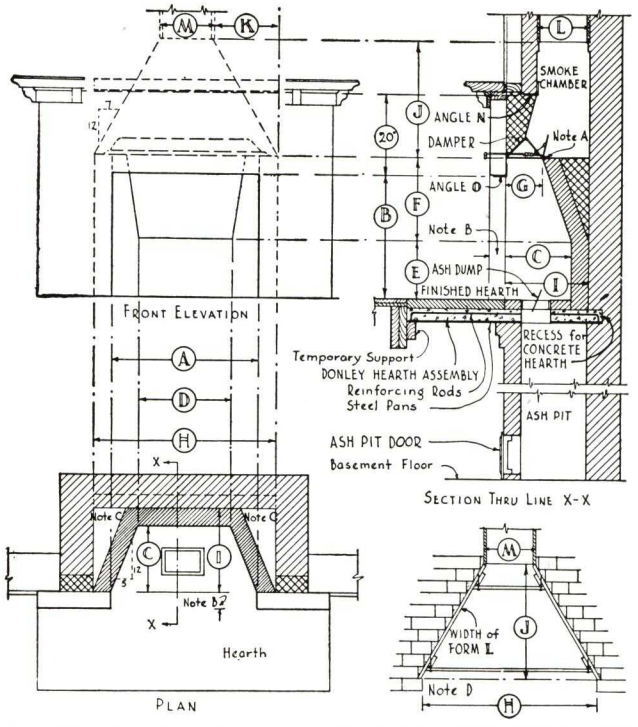
Heatsaver, No.	Equipment					
	Ash dump No.	Ash pit door Size, in.	Opening Angle		Fire basket	Crane (See note below)
			Length, in.	Size, in.		
26	58	10 x 12	30	3x3x$\frac{3}{16}$	No. 24	No. 1
30	58	10 x 12	36	3x3x$\frac{3}{16}$	No. 28	No. 1
34	70	10 x 12	42	3x3x$\frac{3}{16}$	No. 30	No. 2
42	70	10 x 12	48	3x3x$\frac{3}{16}$	No. 40	No. 2
48	70	10 x 12	54	4x3x$\frac{1}{4}$	No. 40	No. 3
60	70	12 x 15	66	4x3x$\frac{1}{4}$	No. 57	No. 4

Note: Supporting lugs are welded to side of unit at factory at no extra charge if crane is ordered with Heatsaver.

ROUGH MASONRY DIMENSIONS IN INCHES—FOR BRICK CONSTRUCTION

Heatsaver, No.	Below hearth		Above hearth		Heatsaver recess dimensions			Flue size	Chimney‡ angle
	Width	Depth	Width	Depth	Width	Depth	Height to lintel	Overall dim.	Set largest leg upright 5 x 3½ x $\frac{5}{16}$
	A*	B	C*	D	E*†	F	H		*
26	50	30	50	17	34	13	49	8½ x 8½	45
30	55	30	55	17	39	13	56	8½ x 13	50
34	59	30	59	17	43	13	56	8½ x 13	54
42	67	31	67	21½	51	17½	63	13 x 13	62
48	75	31	75	21½	59	17½	63	13 x 13	70
60	89	35	89	21½	73	17½	81	13 x 18	6 x 4 x $\frac{3}{8}$ 84

Correct Fireplace Construction



Different features of a fireplace bear such a close relation to each other that disproportion between parts or failure to provide adequately for a single function will result in an unsatisfactory fireplace. The table below gives the proper dimensions for the different parts for fireplaces of various typical sizes.

DIMENSIONS															EQUIPMENT									
FINISHED FIREPLACE OPENING							ROUGH BRICK WORK								ACCESSORIES						FURNISHINGS			
WIDTH	HEIGHT	DEPTH	BACK	VERTICAL or SMALL SLOPED BACK	THROAT		WIDTH	DEPTH	SMOKE CHAMBER	SLOPE of SMOKE CHAMBER	STD RECTANGULAR FLUE LINING Outside Dimension. STD ROUND FLUE LINING Inside Dia.		HEARTH ASSEMBLY	DAMPER Back & Control	DAMPER Poker Control	ASH DUMP	ASH PIT DOOR	STEEL ANGLES 'A' 3×3×$\frac{3}{16}$ 'B' 4×3×$\frac{1}{4}$ 'C' 5×3½×$\frac{5}{16}$		FIRE BASKET	FIRE SCREEN	ANDIRONS	FIRE SET
A	B	C	D	E	F	G	H	I	J	K	L	M	Φ					LENGTH IN INCHES						
In	In	In	In	In	In	In	In	In	In	In	In x In		In	No	No	No	No	In x In	N	O	No	No	No	No
26	24	16	13	14	14	8¾	39	20	24	15	8¼×8¼		10	72	330	230	58	10×12	A 36	A 30	24			
28	28	16	15	14	18	8¾	42	20	25	14½	8¼×13		10	72	330	230	58	10×12	A 42	A 36	24			
30	30	16	17	14	20	8¾	42	20	25	14½	8¼×13		10	72	330	230	58	10×12	A 42	A 36	28			
32	28	16	19	14	20	8¾	44	20	26	15½	8¼×13		10	72	333	233	58	10×12	A 42	A 42	28			
34	30	16	21	14	20	8¾	46	20	28	16¾	8¼×13		12	72	336	236	70	10×12	A 48	A 42	30			
36	30	16	23	14	20	8¾	46	20	28	16½	13×13		12	72-84	336	236	70	10×12	A 48	A 42	34			
40	30	16	27	14	20	8¾	50	20	32	18½	13×13		12	72-84	342	242	70	10×12	A 48	A 42	34			
42	30	16	29	14	20	8¾	54	20	35	20½	13×13		12	84-96	342	242	70	10×12	B 54	A 48	34			
48	33	18	33	14	23	8¾	59	22	40	23	13×13		15	96	348	248	70	10×12	B 60	B 54	40			
54	36	20	37	14	26	13	67	24	42	24½	13×18		15	96	354	254	70	12×15	B 66	B 60	40			
60	39	22	42	14	29	15	71	26	45	26¾	18×18		18	96	360	260	70	12×15	B 66	B 66	57			
72	40	22	54	14	30	13	83	26	56	32½	18×18		18	Special	372	272	70	12×15	C 80	C 80	57			

NOTES TO PLAN AT LEFT

Note A: Back flange of damper must be fully supported and shielded from intense heat by back wall masonry.

Note B: Drawing shows thickness of brick front as 4 in. This will vary with materials used.

Note C: These hollow spaces should be filled to form solid backing. If desirable to include a flue in either space the outside dimensions should be increased.

Note D: Shows a good way to build a smoke chamber by using four boards held apart by spreaders. Letters correspond with those in table.

Correct Fireplace Construction (Continued)

Size of Opening—To insure good draft, the area of flue should be at least one-twelfth that of fireplace opening. Openings in which the relation of height to width is greater than shown in table require flue area, not less than one-tenth the area of fireplace opening.

Separate Flue—A flue of correct size should be provided for each fireplace. It should start above the center and rise not less than 3 ft. above highest point of roof.

Smoke Shelf—Arrests down draft and prevents it from blowing smoke into the room.

Smoke Chamber—Just above the damper, its sides sloping about 7 in. to each foot in height. Smooth unobstructed walls are important.

Hearth Shape—Sides should go straight back for about 4 in. then be splayed at an angle of 5 in. to the foot.

Rear Wall—Should be plumb for 14 to 15 in. then slope forward to form smoke shelf and support damper. This shape deflects heat forward into the room while smoke and gases pass through the damper.

Damper—Explicit attention must be given to damper size and proper placing. Damper should be set with turned-up flange against the front wall and rear flange resting on the smoke shelf. Opening of damper should not be directly under the flue but forward of it. Damper should be 3 to 9 in. above fireplace opening.

Size of Damper—Donley Dampers are made in eleven sizes for fireplaces from 24 to 96 inches wide. A number 230 or 330 damper should be used for fireplaces having openings between 24 and 30 inches wide. For other sizes follow the same rule.

Donley Fireplace Dampers

Provide efficient draft control and smooth correctly proportioned passage for smoke and fumes. Installed according to instructions, they promote correct construction of other features of the fireplace.

Throat Is Narrow—Up to and including 48-in. size the Donley Damper has 8-in. opening at base and 4 ¼-in. at valve. When correctly placed against the forward wall there is room for the back wall to assume the proper forward slope for efficient heating. Narrowness also enables damper to be set forward of flue so that down-draft is pocketed on smoke shelf, back of uplifted valve plate.

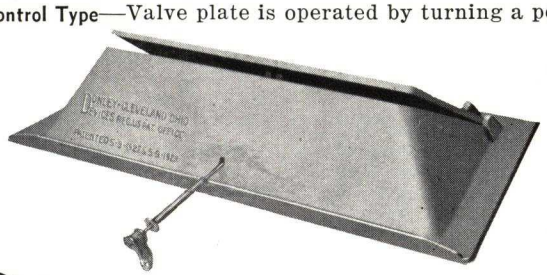
Front Flange—Distinctive turned-up front flange of Donley Dampers permits correct installation at front of fireplace, and at approved height above the opening, regardless of type of facing material or shape of opening.

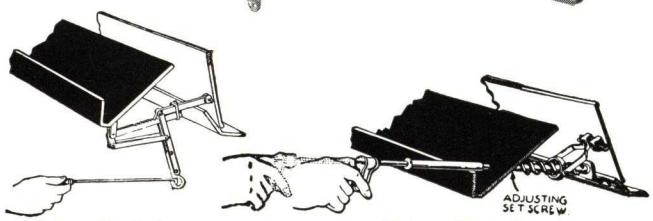
Construction—Of highest grade cast iron.

Rotary Control Type—Valve plate is operated by turning a polished brass knob on front of the fireplace. Regularly supplied in center but also made at right.

Poker Control Type—Valve plate operated by hooking poker in ring hanging down in center and pushing or pulling with slight upward motion.

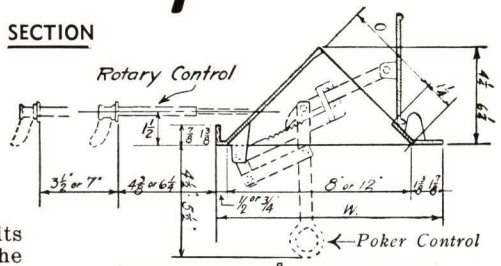
Chain Control Type—Has valve plate pivoted in center. Operated by pulling one of the two chains. Made in 30, 36 and 42-in. sizes only to meet occasional demand.

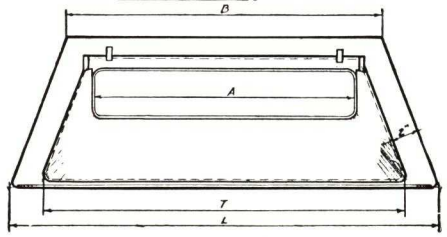




Poker Control — Rotary Control

SECTION





PLAN

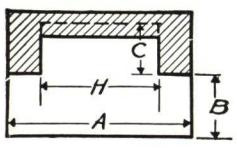
Poker Control No.	Rotary Control No.	Throat T	Throat A	Throat Opng O	Overall Lgth L	Overall Back B	Overall Wdth W
224	324	24	17 5/16	4¼	28½	21	9⅞
230	330	30	23 5/16	4¼	34½	27	9⅞
233	333	33	26 5/16	4¼	37½	30	9⅞
236	336	36	29 5/16	4¼	40½	33	9⅞
242	342	42	35 5/16	4¼	46½	39	9⅞
248	348	48	41 5/16	4¼	52½	45	9⅞
254	354	54	42½	7	58½	46	14⅝
260	360	60	49½	7	64½	53	14⅝
272	372	72	60½	7	76½	64	14⅝
*284	*384	*84	73½	7	88½	77	14⅝
*296	*396	*96	85¾	7	100½	89	14⅝

*Two Valve Plates

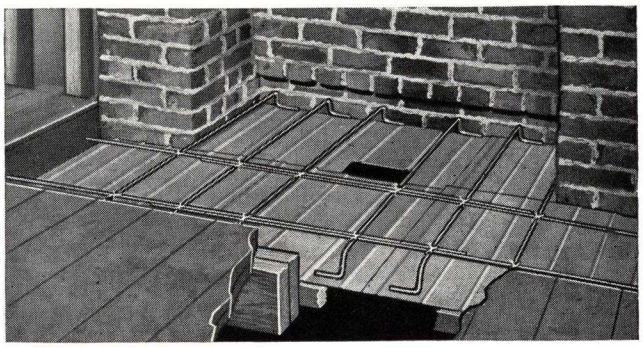
Donley Cantilever Hearth

A cantilever hearth with the axis of its support the front wall of the ashpit and the rear anchored in the rough brickwork is suggested to prevent cracks which frequently occur when the slab is supported partly by the chimney and partly by the floor structure.

Donley Cantilever Hearth Assembly is a convenient means of forming such a hearth. It consists of a centering of corrugated metal sheets laid parallel from front to rear and overlapped, plus necessary reinforcing rods. Main rods are ½ in. bent at each end to form feet which hold rods a tcorrect height for a 3½-in. slab. Fore hearth is further reinforced by 4 lighter crossrods tied to main rods.



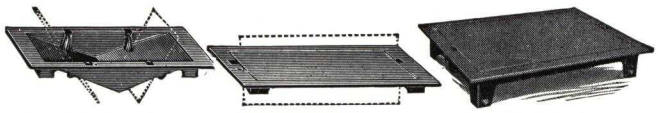
No.	For Hearths With Maximum Measurements of A	B	H	C	Shipping weight
72	72"	24"	48"	24"	63 lbs.
84	84"	24"	48"	24"	68 lbs.
96	96"	24"	72"	24"	78 lbs.



Donley Fireplace Equipment

DONLEY ASH DUMPS

Iron trap doors placed in the hearth for convenient disposal of ashes. Doors in all models are locked into frames to prevent dropping into ashpit. Locking device is below and does not mar smooth top surface. Made of stove grade cast iron to resist warping. Nos. 58 and 70 have single doors pivoted off center so they may be opened and closed with poker. No. 57 has two slightly recessed doors which close themselves. The No. 70, for floor opening 10¼ x 7¼ in., has anchoring flange 2-in. deep.



No. 57 Ash Dump No. 58 Ash Dump No. 70 Ash Dump

DONLEY DUTCH OVEN DOOR

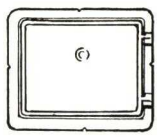
An ornamental door made by expert molders from highest grade cast iron. Used to reproduce Early American Kitchen fireplace or as an ornamental cleanout door beside basement fireplace. Regularly supplied with art black finish, also available in plated antique brass. Fits wall opening 12½ x 15½ in. Over-all size 15x18 in.

DONLEY ASHPIT CLEANOUT DOOR

Three smaller sizes are used as flue cleanouts at base of chimneys. The 10x12-in. size is a convenient shovel size for removing ashes from ashpits. Neat in appearance, close fitting and has anchoring lugs on inner flange. Except as noted, all are made of rust-resisting cast iron.

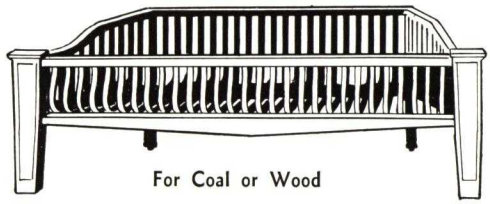
Hght.-Width	Shipping weight	Hght.-Width	Shipping weight
§6x 8″	48 lbs. doz.	12x15″	160 lbs. doz.
7x 9″	74 lbs. doz.	‡24x18″	50 lbs. each
8x 8″	74 lbs. doz.	30x24″	120 lbs. each
8x10″	80 lbs. doz.	*30x24″	70 lbs. each
10x12″	125 lbs. doz.	30x30″	175 lbs. each

§Steel. *Steel door. ‡Available with baffle plate.



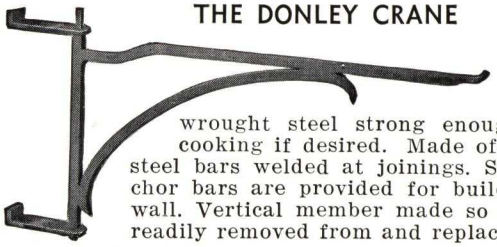
DONLEY FIRE BASKETS

Simple, graceful and correct in design and sturdy enough to stand years of hard use. It is a product of the Donley policy to co-ordinate every feature of the fireplace for efficient operation. Sides splayed inward to coincide with angle of properly designed fireplace. Made of best quality of iron it will not warp. Back legs have rollers to facilitate movement. Removable ends make it possible to burn logs of any length.



For Coal or Wood

THE DONLEY CRANE



Ornamental crane, in 4 standard sizes, of wrought steel strong enough for actual cooking if desired. Made of ⅝-in. square steel bars welded at joinings. Substantial anchor bars are provided for building into side wall. Vertical member made so crane may be readily removed from and replaced in anchors.

DONLEY FIREPLACE FURNISHINGS

Andirons—In a variety of models to harmonize with any interior decoration. Made of cast brass and cast iron with plated antique brass or heat-resisting black painted finish.

Fire Sets—Consist of shovel, poker, tongs, brush and holder. Made of cast brass or iron in a variety of models.

Screens—Made in close-fitting flat and folding types.

Fuel Containers—Wood carriers and coal hods in attractive shapes and finishes.

Complete Catalog of Donley Fireplace Furnishings on request.

Donley Incinerators

Donley Incinerators are of the built-in type of brick with metal parts furnished by The Donley Brothers Co. These consist of Hopper Type Receiving Door with frame and trim for each floor, Waste Distributor, Dumping Grates, supporting frame and handle, Fire Door, Ash Door, Aerator Door and Spark Screen. Nine sizes available as shown in table—a size for every requirement.

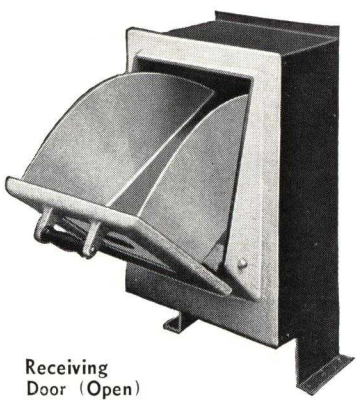
Combustion chamber connects with a smooth, straight flue which acts as a chute for wastes and combustion outlet. Adjoining combustion chamber is a narrower air chamber lined with common brick and communicating with the former by a lattice of fire brick through which air freely passes to dry out moisture and permit easy combustion of wastes.

Air chamber is the full height of combustion chamber. This gives ample access of air, even when garbage is piled high and the important advantage of top draft combustion. Drying is continuous. Burning is somewhat slower but surer and without the roaring flame caused by bottom draft.

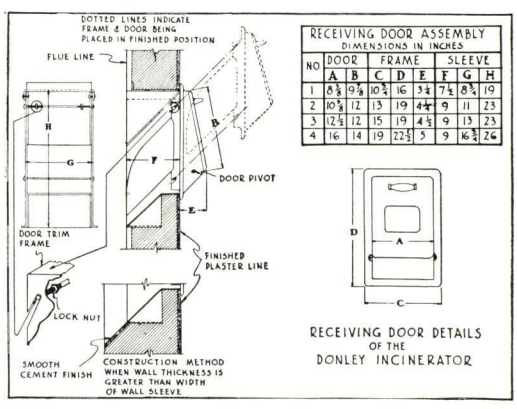
Waste Distributor—Breaks up bundles and spreads waste over the entire grate area. Used on all but size No. 28.

Donley Receiving Door Unit—Easily operated, attractive in design and finish and excludes all odor or smoke from upper floors. Wall sleeve frame is made of heavy sheet metal. Wide flanges anchor it securely in the masonry.

Trim frame and hopper door are of cast iron ground to fit within .005 in. Accurate bearings insure tight closing. Exterior has Krincle finish with center panel white enamel. Special finishes supplied at moderate extra cost. Hopper door opens from the top and is balanced to close itself from any position. A special quiet door check is provided as an extra on the Nos. 2 and 3 doors. Hopper is of 14-gauge sheet metal attached to the door and designed to close the stack when door is open.



Receiving Door (Open)

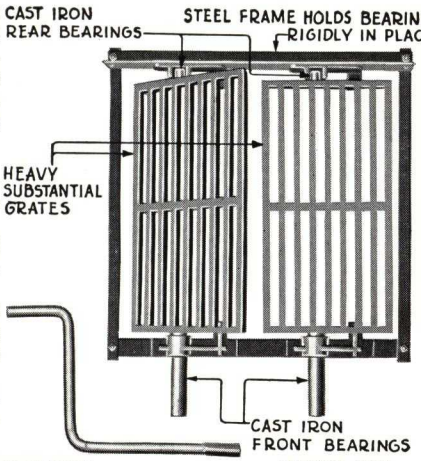


RECEIVING DOOR ASSEMBLY
DIMENSIONS IN INCHES

NO	DOOR		FRAME			SLEEVE		
	A	B	C	D	E	F	G	H
1	8⅜	9⅜	10¾	16	3½	7½	8¾	19
2	10⅜	12	13	19	4½	9	11	23
3	12½	12	15	19	4½	9	13	23
4	16	14	19	22½	5	9	16¾	26

RECEIVING DOOR DETAILS OF THE DONLEY INCINERATOR

Donley Dumping Grates—Heavy, staunch and trouble-free. They can be removed and replaced through the fire door. Removal will rarely be necessary. Grates rest on iron frame easily installed on a course of masonry of proper height without special fitting.



Installation Data—Accompanies every incinerator including prints of full construction details.

Footings should extend 6 in. beyond incinerator walls. Top of footing 4 in. below finished floor level.

Walls of combustion chamber are of common brick lined with fire brick above grates, including header course as follows:

Nos. 28 to 100 inclusive: minimum 4-in. common brick, ½-in. air space, 4½-in. fire brick. Total 9 in.

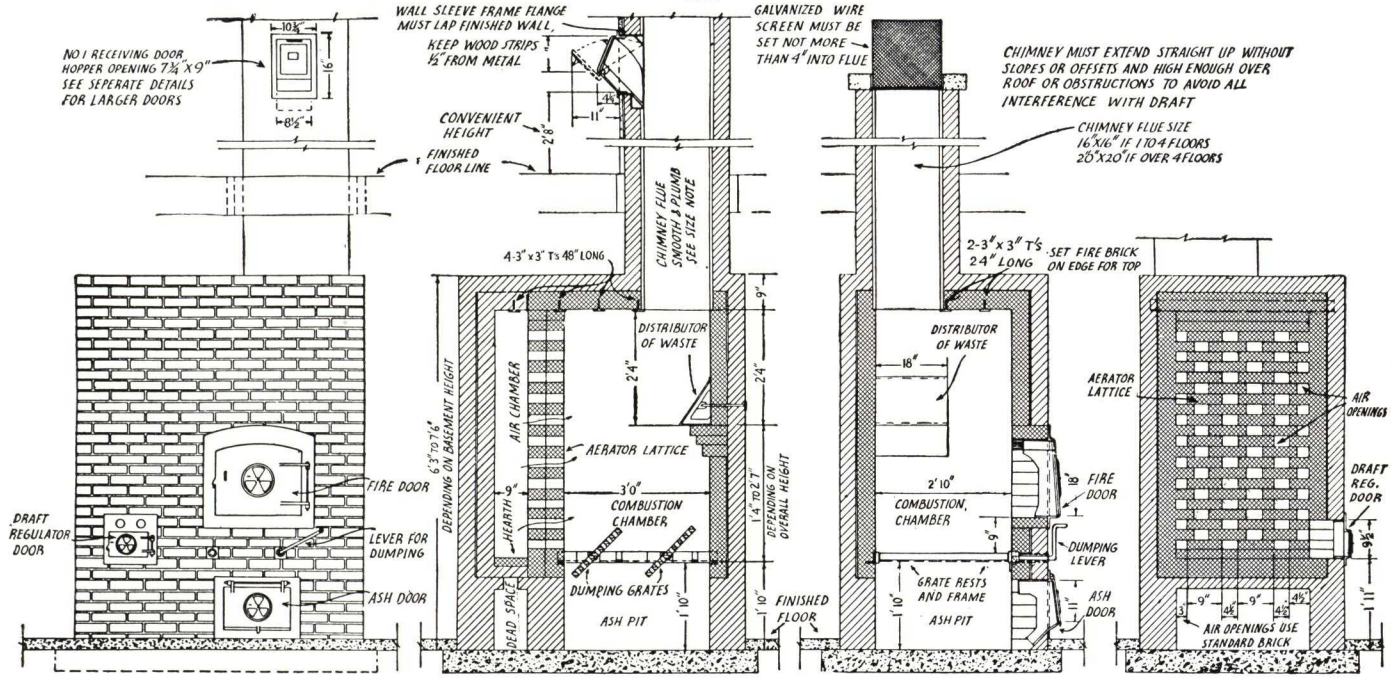
Nos. 125, 140 and 163: Minimum 8-in. common brick, 1-in. air space, 4½-in. fire brick. Total 13½ in.

Fire brick should be laid in fire clay, dipped, not buttered, to obtain thin joint and avoid crumbling. Proper bonding is shown in construction details.

Flues—Up to 16x16 in. may be lined with standard flue lining. Larger flues must be lined with fire brick for 20 to 30 ft. above combustion chamber.

Gas Burner—Available as an extra for places where garbage is unusually moist, such as fruit or vegetable stores.

Door is made in 4 sizes: No. 1, 8x9 in.; No. 2, 10x12 in.; No. 3, 12x12 in.; No. 4, 16x14 in.



USES, DIMENSIONS AND EQUIPMENT OF DONLEY INCINERATORS

Size No.	Recommended use	Minimum inside size of flue to use	Incinerator Dimensions			Incinerator Equipment					Brick Required to Build (Including 5% allowance for waste)			
			Inside of combustion chamber	Outside dimensions of brickwork	Height outside	Number and size of grates	Size of fire door	Size of ash door	Ship. wt., lbs.	Receiving door recommended	Based on wall		Common brick	Fire brick
											Thickness	Height		
28	Res. 5 to 7 rooms	*11¼"x11¼"	20"x20"	3'4½"x3'2"	6'6" to 7'2"	2-9"x18"	11½x9"	11½x9"	195	No. 1	9"	7'	790	325
32	Res. 5 to 10 rooms	*11¼"x11¼"	22½"x23"	4'6" x3'5"	6'6" to 7'6"	2-9½x20"	11½x9"	11½x9"	275	No. 1 or 2	9"	7'	930	367
46	Res. 8 to 14 rooms Apts. to 18 rooms	*11¼"x11¼" If 2 Fls. †15¾"x15¾"	27"x24½"	4'8" x3'9"	6'6" to 7'6"	2-11½x23½"	17x11"	17x11"	295	No. 1 or 2	9"	7'	1018	410
70	Large residences Apts. 18 to 40 rms.	†15¾"x15¾"	33"x30"	5'9" x4'0"	6'6" to 8'2"	2-14x27¾"	17x11"	17x11"	425	No. 2-3 or 4 see note	9"	8'	1282	546
85	Apts. 40 to 80 rms. Hosp. under 50 beds Schools under 300 students Small stores under 6 group	†15¾"x15¾" If 5 Fls. & over 20"x20"	36"x34"	6'0" x4'4"	6'6" to 8'2"	2-16x31¾"	22x18"	17x11"	570	No. 2-3 or 4 see note	9"	8'	1396	594
100	Apts. 80 to 120 rms. Hosp. 50 to 90 beds Schools 300-500 students Small stores 6-8 group	†15¾"x15¾" If 5 fls. or over 20"x20"	48"x30"	7'0" x4'0"	6'6" to 8'2"	3-14x27¾"	22x18"	17x11"	630	No. 2, 3 or 4 see note	9"	8'	1359	714
123	Apts. 120-160 rms. Hosp. 90-120 beds Schools 500-700 students Small stores 8-10 group	Same as 100	52"x34"	8'1" x5'1"	7'6" to 8'6"	3-16x31¾"	30x24"	2-17x11"	1030	No. 2, 3 or 4 see note	13"	8'	1709	765
140	Apts. 160-240 rms. Hosp. 120-180 beds Schools 700-1000 students Small stores 10-15 group	Same as 100	63"x30"	9'0" x4'9"	6'6" to 8'2"	4-14x27¾"	22x18"	2-17x11"	840	No. 2, 3 or 4 see note	13"	8'	2938	824
163	Apts. 240-320 rms. Hosp. 180-260 beds Schools 1000-1200 students Small stores 15-18 group	20"x20" If 5 fls. or over 24"x24"	69"x34"	9'6" x5'1"	7'0" to 8'6"	4-16x31¾"	30x24"	2-17x11"	1250	No. 2, 3 or 4 see note	13"	8'	3325	850

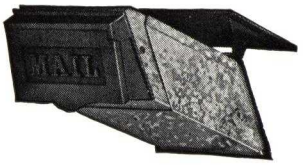
Note on Capacity—Cubic foot equals .808721 bushels.
*Standard 13x13-in. flue lining (outside measure).
†Standard 18x18-in. flue lining (outside measure).

Notes on Receiving Door—For stores, use No. 4. Where two or more families use same receiving door, use No. 3 or No. 4. Shipping weights of Receiving Doors—No. 1, 37 lbs.; No. 2, 52 lbs.; No. 3, 65 lbs.; No. 4, 105 lbs.

Donley Mail Receivers

At the left is the No. 10-F mail receiver. No. 10-B is the same except for longer body. Both are complete with name-card holder and electric pushbutton

Illustration at the left is No. 3-F box type receiver. No. 3-B has a larger, deeper body and an outer door like that shown below at right



No. 1-F above, chute type, has a mail opening 5″ x 2½″. No. 2-F is similar, but opening is 8¾″ x 2½″

No. 2-B at right, also chute type, with mail opening 8¾″ x 2½″. No. 1-B is similar but opening is 5″ x 2½″

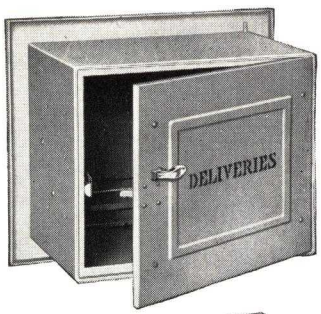
Substantial outer doors and frames offer complete weather resistance. No. 10 Receiver, shown at left has attractive, bronze door in deep finish and large, straight line chute, communicating with inner door of steel, primed for any decorative treatment. Push button for door bell, with sufficient wire to carry to point convenient to electrician, is mounted below receiving door. Card pocket above has celluloid pane. Two types of horizontal opening receiver. Telescoping, two piece chute provides method of adapting receivers to various wall thicknesses.

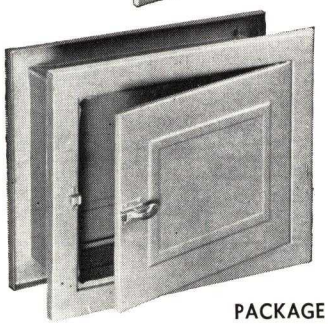
F INDICATES FOR FRAME CONSTRUCTION; B FOR BRICK

No.	For wall thickness	Mail opening		Shipping weight
		Width	Height	
*10-F	5″ to 9″	3″	6″	6 lbs.
*10-B	9″ to 14″	3″	6″	6 lbs.
1-F	5″ to 9″	5″	2½″	6 lbs.
1-B	9″ to 14″	5″	2½″	6 lbs.
2-F	5″ to 9″	8¾″	2½″	8 lbs.
2-B	9″ to 14″	8¾″	2½″	8½ lbs.
3-F	5″ to 9″	8¾″	2½″	10 lbs.
3-B	9″ to 14″	8¾″	2½″	11 lbs.

*No. 10-F and 10-B are complete with name-card holder and Electric Push-Button. On other numbers there is an extra cost for these attachments.

Donley Package Receivers





A necessity in the modern home. They permit deliveries at any time and protect articles against pilfering and cats or dogs. Delivery people need not enter the kitchen.

Insulated, Ventilated—Outer door is insulated to protect against heat and cold. Inner door is ventilated to keep the interior at approximately the room temperature.

Locks Automatically—Closing the outer door on Nos. 1 and 2 locks it automatically. Lock is released by opening inner door. Locking device may be rendered inoperative if desired. It is omitted on Nos. 3 and 4 on which the direction of opening of the inner door is reversible. Pull type catches of nickeled brass on both doors.

Staunch and Attractive—Made of heavy gauge steel, welded at joints. Both doors attractively paneled. Inner door surrounded by frame. Outer door has no projecting frame behind which moisture can collect and cause rust. This construction permits recessing if desired. Holes are provided for nailing. Hinges are concealed.

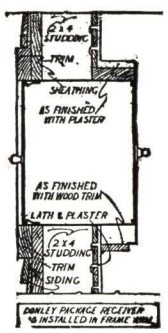
Installation—In different types of walls is illustrated in the drawings. Note that different practice with regard to trim is shown at top and bottom.

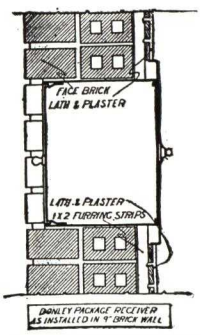
Apartment House Receivers—Designed for access through inside corridor wall where insulation is not a factor. Body made in two pieces to fit any wall thickness and with telescoping adjustment of ½-in. to allow for variations. Installed after plastering by nailing to a frame of ⅞-in. lumber built into the opening.

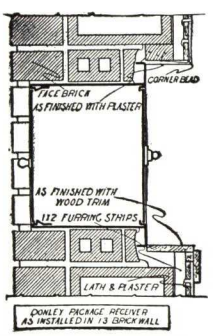
PACKAGE RECEIVER DIMENSIONS

No.	Body		Over all front to back	Inside frame	Facing inside door, with hinge	Shipping weight
	Width	Height				
1	13⅞″	11⅛″	9″	16¾″x14″	On Left	20 lbs.
2	13⅞″	11⅛″	9″	16¾″x14″	On Right	20 lbs.
3	13⅞″	11⅛″	6″	16¾″x14″	Reversible	16 lbs.
4	13⅞″	11⅛″	9″	16¾″x14″	Reversible	20 lbs.

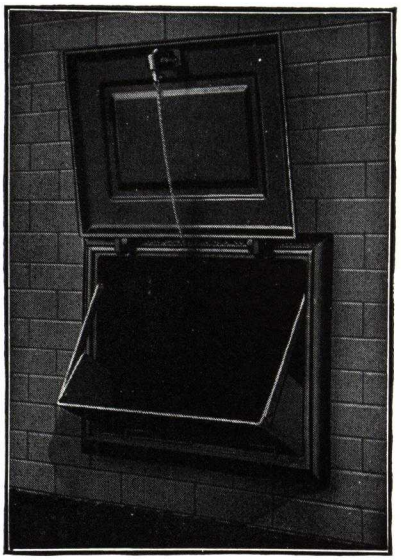
Note: Return of flange on inside, ¾ in. Nos. 1 and 2 have automatic lock; Nos. 3 and 4 no automatic lock.







Donley Coal Chutes

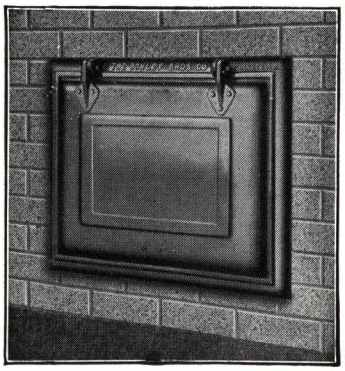


Highly durable, these chutes withstand the most battering service without defacement. The door when open for service is held upright by the formation of the hinges and protects wall of building from injury by flying fuel. Glass paneled doors have a shield which drops over glass when door is open but does not obstruct light when door is closed.

Automatic latch secures the door firmly when door is closed. No exposed locking device on which burglar can work.

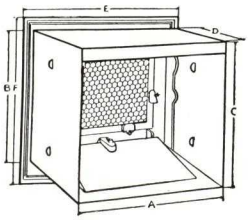
Donley Chutes have copper steel rust-resisting body, reinforced by steel angles. Frame and hinges are of malleable iron, or copper-bearing steel.

Automatic lock, released from inside only, is of malleable iron with chain release which may be carried outside the bin.



FOUNDATION CHUTES

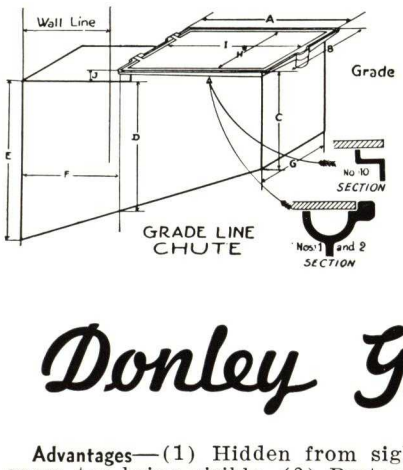
For installation in the foundation wall they are made in twelve types which differ in regard to the doors, straight or slanting bottom and availability of hoppers. Clear glass is bedded on cork and held in place by clips (see page 6). Wire glass is ¼ in. thick set in putty.



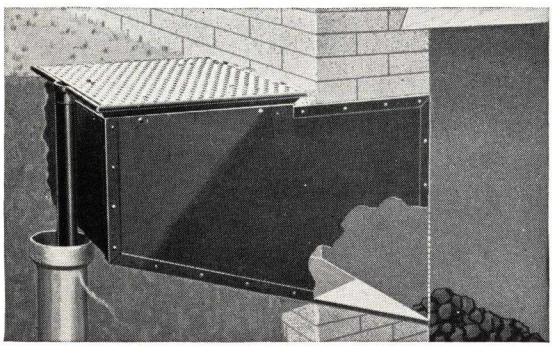
Order by No.	Description		Rough Wall Op'ngs			Bottom of Chute	Shp'g. W'ght	Hoppers
	Door	Frame	Wide	High	Deep			
19	Solid Steel	Copper Steel	24″	17″	8″	Straight	31 lbs.	None
29	Solid Steel	Malleable	24″	17″	8″	Straight	41 lbs.	None
48	Clear Glass, 3 Lts.	Copper Steel	24″	17″	8″	Straight	40 lbs.	None
39	Clear Glass, 3 Lts.	Malleable	24″	17″	8″	Straight	50 lbs.	None
213	Solid Steel	Malleable	24″	17″	12″	Slanting	47 lbs.	Optional
313	Clear Glass, 3 Lts.	Malleable	24″	17″	12″	Slanting	55 lbs.	Optional
613	Solid Steel	Malleable	32″	22″	12″	Slanting	81 lbs.	Optional
713	Clear Glass, 3 Lts.	Malleable	32″	22″	12″	Slanting	88 lbs.	Optional
612	Solid Steel	Copper Steel	32″	22″	12″	Straight	60 lbs.	None
712	Clear Glass, 3 Lts.	Copper Steel	32″	22″	12″	Straight	65 lbs.	None
617	Solid Steel	Malleable	32″	22″	17″	Slanting	90 lbs.	Optional
717	Clear Glass, 3 Lts.	Malleable	32″	22″	17″	Slanting	97 lbs.	Optional

GRADE LINE CHUTES

For use where the foundation wall is too low to receive the foundation chute. Horizontal opening is set level with the lawn or walk. Door opens against building to protect it from flying fuel. Automatic lock released from inside only. Frame on Nos. 1 and 2 is heavy malleable iron with gutter to prevent water entering cellar. Gutter has outlet outside the chute for connection to drain. Frame on No. 10 is a special steel section, welded at corners, which door overlaps. Lip prevents water entering cellar. Door of checkered steel, is non-slip and capable of supporting sidewalk traffic. Hinge of Nos. 1 and 2 of malleable iron, No. 10 of steel, all with brass hinge pin.



Chute No.	A	B	C	D	E	F
19, 29, 39 and 48	22″	16″	16″	8″	25″	19″
213 and 313	22″	16″	18½″	12″	25″	19″
612 and 712	30½″	21″	21″	12″	34½″	24½″
613 and 713	30½″	21″	23″	12″	34½″	24½″
617 and 717	30½″	21″	25½″	17″	34½″	24½″



No.	A	B	C	D	E	F	G	H	I	J
10	19	19	14	19	24½	15	19	19	19	1¾
1	21	26¼	14¾	19½	24½	14¼	24½	25¼	20	2½
2	27	32¼	17¾	24¾	30½	16¼	30½	31¼	26	2½

In ordering the Donley Grade Line Coal Chute please consult dimensions in the above table and order by number.

Donley Garbage Receivers

Advantages—(1) Hidden from sight, only inconspicuous green top being visible. (2) Protected from frost. (3) No hammering of container to free contents. (4) Opened by foot lever, so (5) dogs cannot open it and spill the garbage. (6) Tight lid minimizes odors.

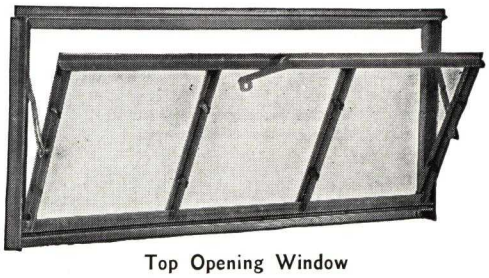
Construction—Outer shell made of 16-gauge copper-alloy steel strengthened by corrugations at top and bottom. Bottom open to permit drainage and stiffened by galvanized cross rods on which pail rests. Heavily painted with asphaltic paint.

Container or pail made of copper alloy steel galvanized after fabrication. Ample clearance for lifting out pail which is slightly tapered to facilitate removal and return. Service lid made to close fit to larger cover which is hinged to outer shell and opened only when pail is removed. Made in 4 sizes, 9, 12 15 and 21-gal. capacity.

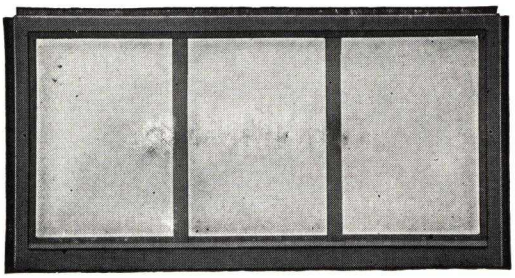
Donley Basement Windows

OFFERED IN TWO TYPES

Glazed With or Without Putty



Top Opening Window



Bottom Opening Window

These windows meet all conditions of easy installation, convenient use, and maintenance, long service and unusual weather protection.

Made in Two Types—Top opening and bottom opening. Top opening has the advantage that no ordinary intruder can enter even when open. Top opening type held in open position by slotted side arms with two stages of opening.

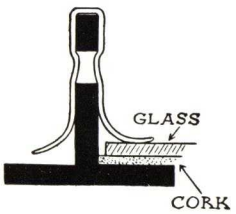
Sash Can Be Removed—From the inside in either type. This allows bulky objects to be brought through the window and makes re-glazing simple and convenient. Glazing clips described below simplify replacing glass. They may be used alone or putty may be added for extra weather-proofing.

Substantially Made— By welding ⅛-in. thick hot-rolled steel members. Outer frame is of double angle construction with a projecting flange which anchors the frame securely in the masonry just back of the facing. Frame has sufficient breadth to meet both face and back-up masonry in close contact that makes pointing unnecessary.

Ventilating Unit—Interior glazed. Glass bears against an exterior flange at top and two sides where it is bedded on a cork strip. At the bottom the flange and cork are on the inside so that water is shed directly on the steel apron providing complete weathering.

Glass in Standard Sizes—Donley Basement Windows are furnished unglazed. Glass used is standard sizes.

Glazing With Jiffy Clip—Insert the lower edge of glass inside the flange at bottom of opening, then lay it against the other three sides. The clip is sprung into place and held by grooves in the T-section that coincide with the projections in the clip. The clips are of tempered spring steel and rustproofed by the Parker process.

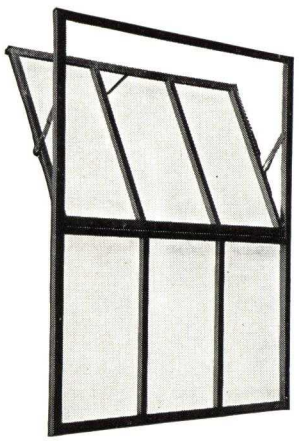


No. Top opening	No. Bottom opening	Glass size	Masonry openings	Over-all dimensions	Shipping weight
1	11	2 light—10″x12″	22¾″x15″	23¾″x15½″	14 lbs.
2	12	2 light—10″x16″	22¾″x19″	23¾″x19½″	15 lbs.
3	13	2 light—14″x20″	30¾″x23″	31¾″x23½″	21 lbs.
4	14	3 light—10″x12″	33¼″x15″	34¼″x15½″	19 lbs.
5	15	3 light—10″x14″	33¼″x17″	34¼″x17½″	21 lbs.
6	16	3 light—10″x16″	33¼″x19″	34¼″x19½″	22 lbs.
7	17	3 light—10″x20″	33¼″x23″	34¼″x23½″	23 lbs.
8	18	3 light—12″x18″	39¼″x21″	40¼″x21½″	24 lbs.

Glazing With Jiffy Clip

Put glass in place — Take a jiffy clip — And just snap it on

Donley Utility Windows



A general purpose, metal framed window of sturdy construction and simple design. Same general construction as Donley Basement Window.

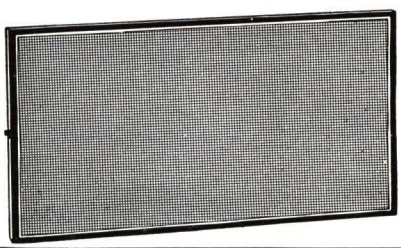
The 6 light type is made in 2 sizes with upper 3 lights forming ventilator as illustrated. The 9 light type has 3 fixed lights above and 3 below the ventilator.

Widely used for garages, shops, store rooms, basement recreation rooms, studios and any place where a spacious, strongly built window is required.

Operation of ventilator same as for top opening basement window. Made for putty glazing only. Wire glazing clips with each window.

No.	Number of lights	Nominal glass size	Over-all dimensions
21	6	10″x16″	32½″x35½″
22	6	12″x20″	38½″x43½″
32	9	12″x20″	38½″x64″

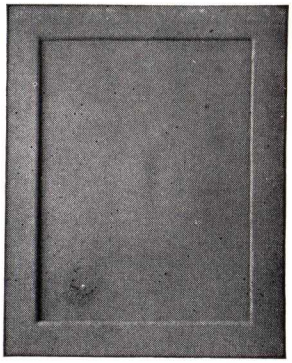
Screens for Donley Windows



Close mesh bronze screens with metal frames are available to fit any size window listed. Screen is complete, ready to install, no drilling or fitting is necessary. Simply insert two screws from the inside and the screen is securely fastened in place.

Miscellaneous Donley Devices

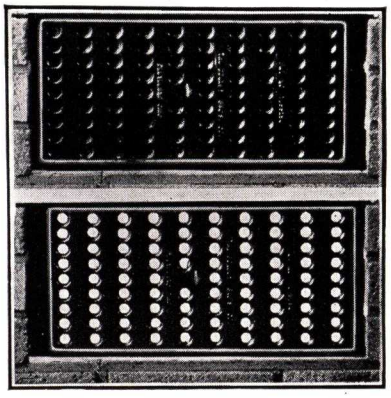
DONLEY LAUNDRY CHUTE DOORS



Inward opening, self-closing. Door and frame are a complete unit easily installed with concealed nailing. Inconspicuous but always ready for use. Frame extends only ¼ in. beyond wall line. Wide inward flange for attachment to laundry chute eliminates sharp edges which might catch clothes. Regularly finished with gray priming coat. Also available in chromium finish. Wall opening 9x12 in.; over all, 11x14 in.

DONLEY VENTILATORS

Provide fresh air under porches, under buildings without basements, in attic or closed lofts, vegetable cellars, soffit spaces, etc. Made in adjustable and continuously open types.

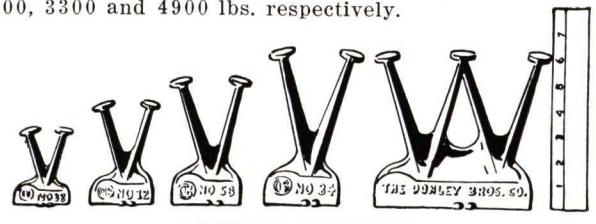


Adjustable Ventilator—Made in one size—16 in. wide by 8 in. high, of cast iron or cast bronze. It is made of two pieces fastened together with brass connections. One part has anchoring legs holding it firmly in the wall. The other part is movable. A push to the left adjusts the openings as desired. Bronze screen furnished at slight extra cost. Patented.

Continuously Open Ventilators—Made in diagonal and bar type. Size 4x8 to 24x12 in.

DONLEY CONCRETE INSERTS

Anchored in concrete ceilings or walls they provide dependable support for any suspended fixtures. Made of malleable iron. Exposed face has a slot for bolt head. Roots traverse the axis of shearing strain to offer maximum grip in concrete. Made in 5 sizes for ⅜, ½, ⅝ and ¾-in. bolts, with safe loads of 1200, 2300, 3300 and 4900 lbs. respectively.



DONLEY ANCHORS

Joist Anchors—Provide secure anchorage for joists supported by brick walls. Nailed to top of joist and embedded in masonry with vertical crossrod. Sizes: 1x$\frac{3}{16}$x14 in.; 1x$\frac{5}{16}$x18 in.; 1½x¼x18 in.

Wall Plate Anchors—For anchoring sill to foundation and roof plate to brick wall. Made from ½-in. rod 18 in. long with 2-in. angle at one end and 2-in. thread at other. Furnished with nut and washer.

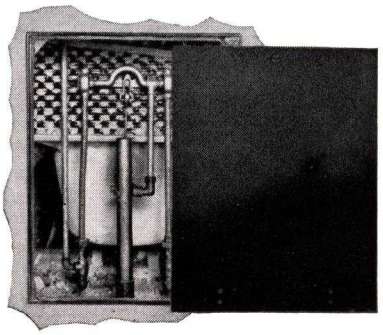
Stone Anchors—For attaching stone to backup wall. Made of flat steel $\frac{5}{16}$x1 in. with reversed offsets at the two ends. Hot galvanized. Standard length $6\frac{5}{16}$, $8\frac{5}{16}$, $10\frac{5}{16}$, $12\frac{5}{16}$ in.

Door Buck Anchors—For securing jambs or rough bucks to masonry walls. Made of 2x$\frac{1}{16}$-in. flat steel, 12 in. long with 2-in. turned up end perforated for nailing. Perforations in horizontal arm engage mortar in joint. Space 2 ft. apart.

DONLEY ACCESS DOORS

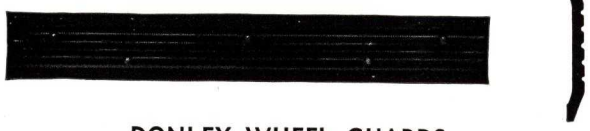
Save the need of tearing out plaster to reach hidden plumbing, wiring or steam pipes. Absolutely flush with the wall they may be caulked and painted or papered.

Unit consists of a frame and door. Frame is made from two welded angles, its outer edge perforated for plaster key and easy nailing. Door is held in place by two lugs at bottom and interior button catch at top. Catch is operated by inserting screwdriver and turning. Door is of furniture type steel and will hold its shape. It is finished in gray priming coat. Made in 5 sizes with door openings 8x10, 12x16, 16x20, 18x24 and 20x30 in.



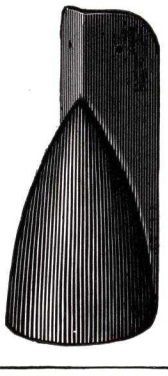
DONLEY METAL THRESHOLDS

Made of cast iron, extruded brass or aluminum, they give long wear, assure a close fitting door and make a neat, attractive joint where contrasting materials meet. Cast iron 3½ and 4½ in. wide, brass and aluminum 4 in. wide. Height ½ in., except aluminum, which is ⅝ in.



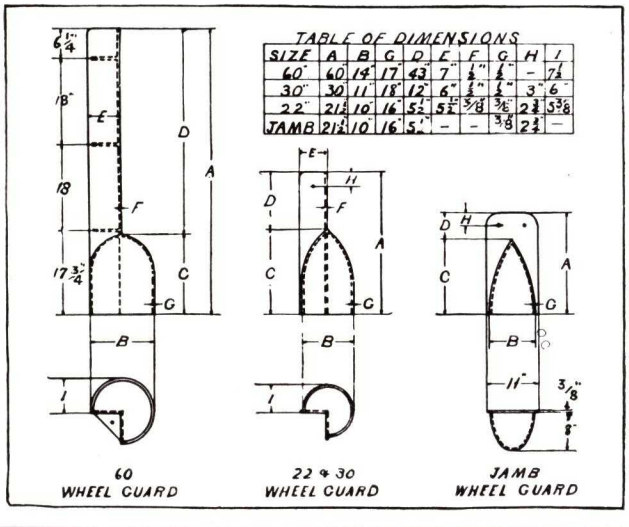
DONLEY WHEEL GUARDS

Made for corners and jambs. Cast iron, heavy enough to deflect any wheel and prevent damage by the hub. Secured by two ½x8-in. bolts provided with each guard.

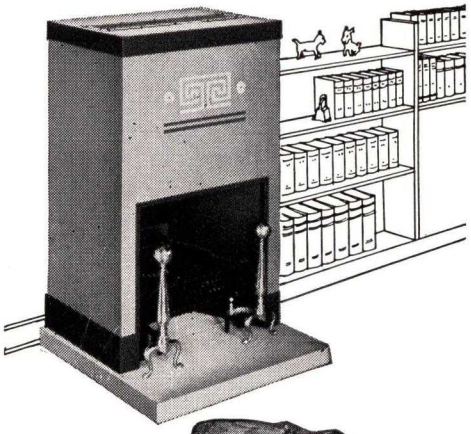


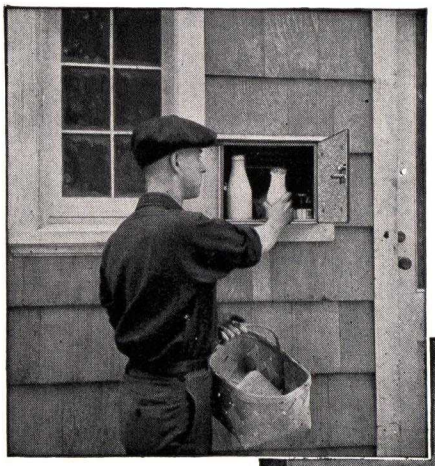
Corner Guards—Made in three sizes, 22, 30 and 60 in. in height. Sixty-inch type protects against projecting truck bodies or loads.

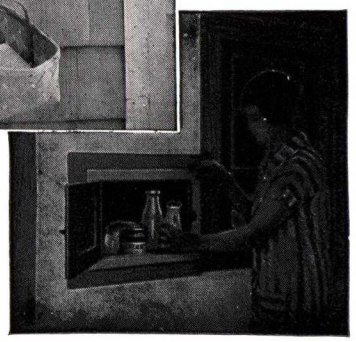
Jam Guards—Bolt against flat surface of the door jamb giving positive clearance in entrance and exit of vehicles. Indispensable in public garages, service stations, warehouses and terminals. Does not diminish effective width of door.

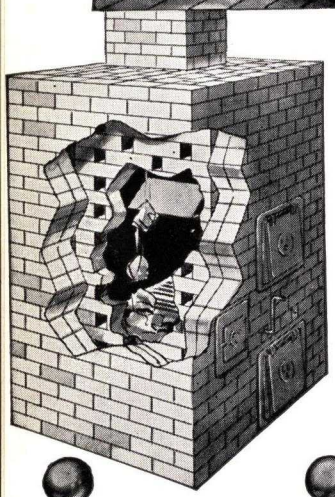


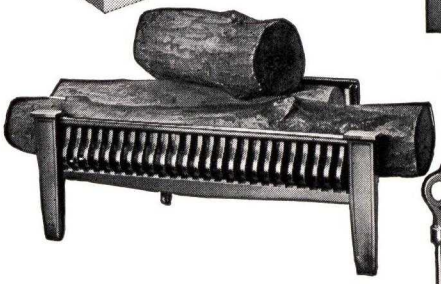
DONLEY DEVICES
Complete the Home

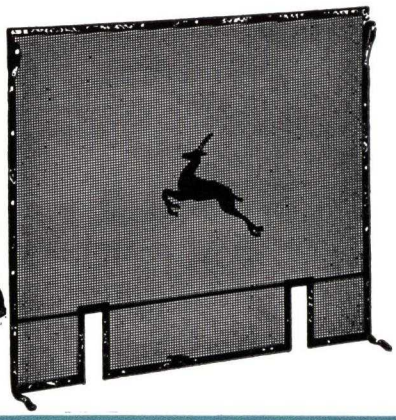


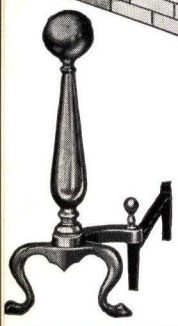


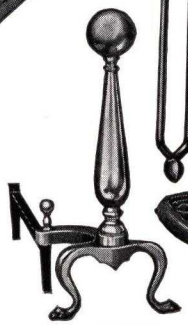












THE DONLEY BROTHERS COMPANY
13932 MILES AVENUE • CLEVELAND, OHIO

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SECTION 26

CONTINUED ⟶

TELEPHONE
LExington 2-9045

FYR-SLYD-SCREEN, INC.

101 Park Avenue, NEW YORK, N. Y.

ATLANTA, Joseph S. Cook, 8 Ridgeland Way—Cherokee 1958
BALTIMORE, MacCarthy Hardware, 15 W. Franklin—Vernon 0682
BOSTON, W. C. Vaughan Co., Haymarket Square—Capitol 1770
CHICAGO, L. W. Kent & Co., 228 No. La Salle St.—Central 0237
CINCINNATI, Calvin C. Huenefeld, 626 Broadway—Cherry 2440
CLEVELAND, Durable Products, Inc., 103 Terminal Tower Arcade—Prospect 1831
LOS ANGELES, Pacific Agents, 2141 West Adams—Pa. 1882
MIAMI, Jos. H. Nauss, 59 N. W. Tenth St.—36497, 41955
NEW HAVEN, S. Barry Jennings & Co., 142 Nash St.—N. H. 8-4828
PHILADELPHIA, Wm. H. Watts & Co., 151 No. 16th St.—Rit. 2627
RICHMOND, R. Massie Nolting, 1103 E. Main St.—2-3365
SAN DIEGO, Pacific Agents, 1202 Kettner Blvd.—Main 3144
ST. LOUIS, Butler-Kohaus, Inc., 2823 Olive St.—Jefferson 4727
WASHINGTON, D. C., Lally-Rohlader Co., 1756 M St.—National 7065

THE NEW DISAPPEARING SPARKSCREEN—COUNTERBALANCED, SLIDES VERTICALLY, BALL BEARING

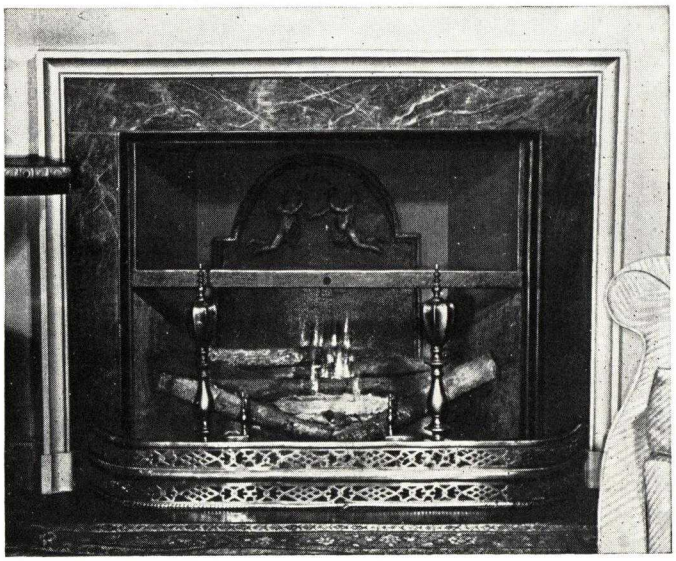
The Deluxe Model

Easy Operation—*Operates like a double-hung window.* Slides into a pocket built into the furring above fire-opening. Being exactly counterbalanced, and fitting loosely between narrow channel guides, there is practically no friction and it runs up and down easily at touch of the poker. Never necessary to touch the screen with the hands. No chain or crank to manipulate.

100% Fire Protection—Gives absolute fire protection. No apertures at top or sides through which sparks may fly. Fabric will not fuse from contact with live embers.

Never in the Way—Easily operated from the chair by the fire. Eliminates the nuisance of portable screens.

All Units Made to Order—Made to suit the conditions of each individual job. Shop and installation drawings furnished where desirable. Standard screen of bronze. Other materials may be specified.



Specify Fyr-slyd-screen (Pat.) for All Fine Interiors in New Work
Clients will appreciate your providing for their convenience and comfort

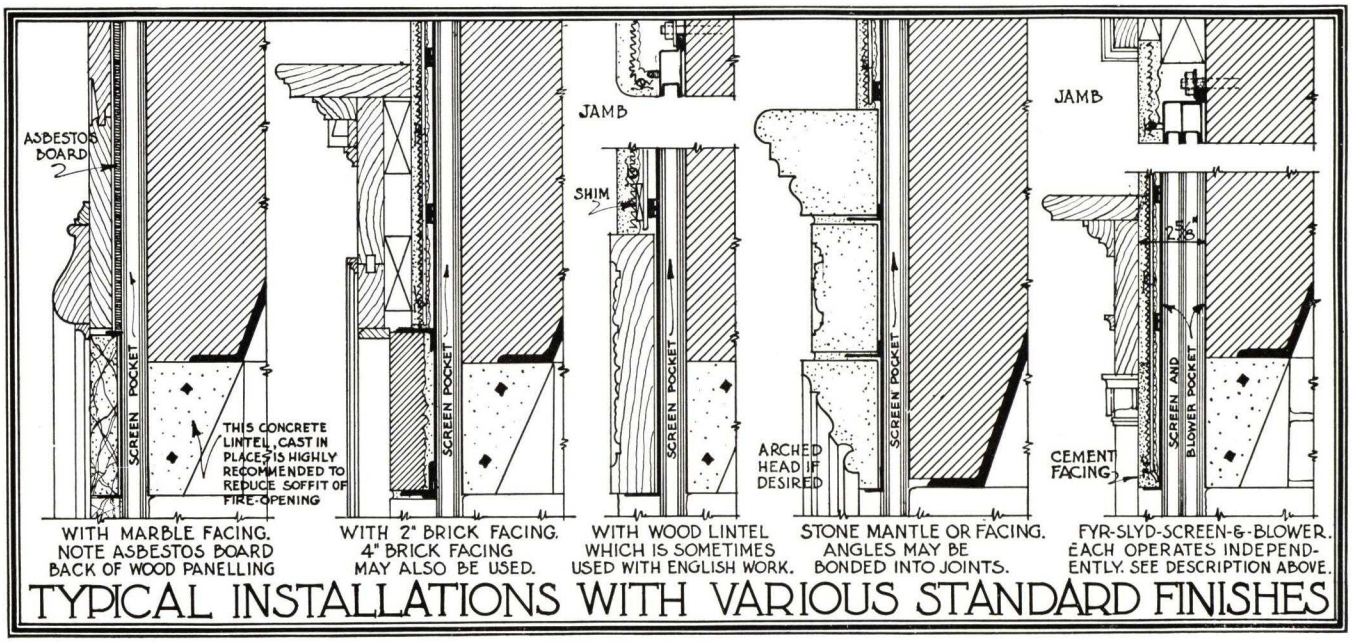
Sturdy Construction; Moving Parts Removable—Screen will withstand rough usage but if damaged by unusual accident may be readily removed and repaired or replaced. All moving parts are always accessible.

Applied Decorations—Screens may be decorated from your details.

For Large and Small Fireplaces—Fits any fireplace. The only sparkscreen to give full satisfaction when fitted to large fire-openings.

Fyr-slyd-screen-and-Blower-Combination—Practical and valuable installation where a fireplace is intended for frequent use. Double pocket accommodates, in addition to the sparkscreen, a "blower" which consists of a framed sheet of aluminum. Blower, when lowered to within 4 in. of the hearth, induces a strong draft and new or sluggish fires are quickly made to burn vigorously.

A Long List of Well Known Architects Specify Fyr-Slyd-Screens — This is the Best Evidence of Quality



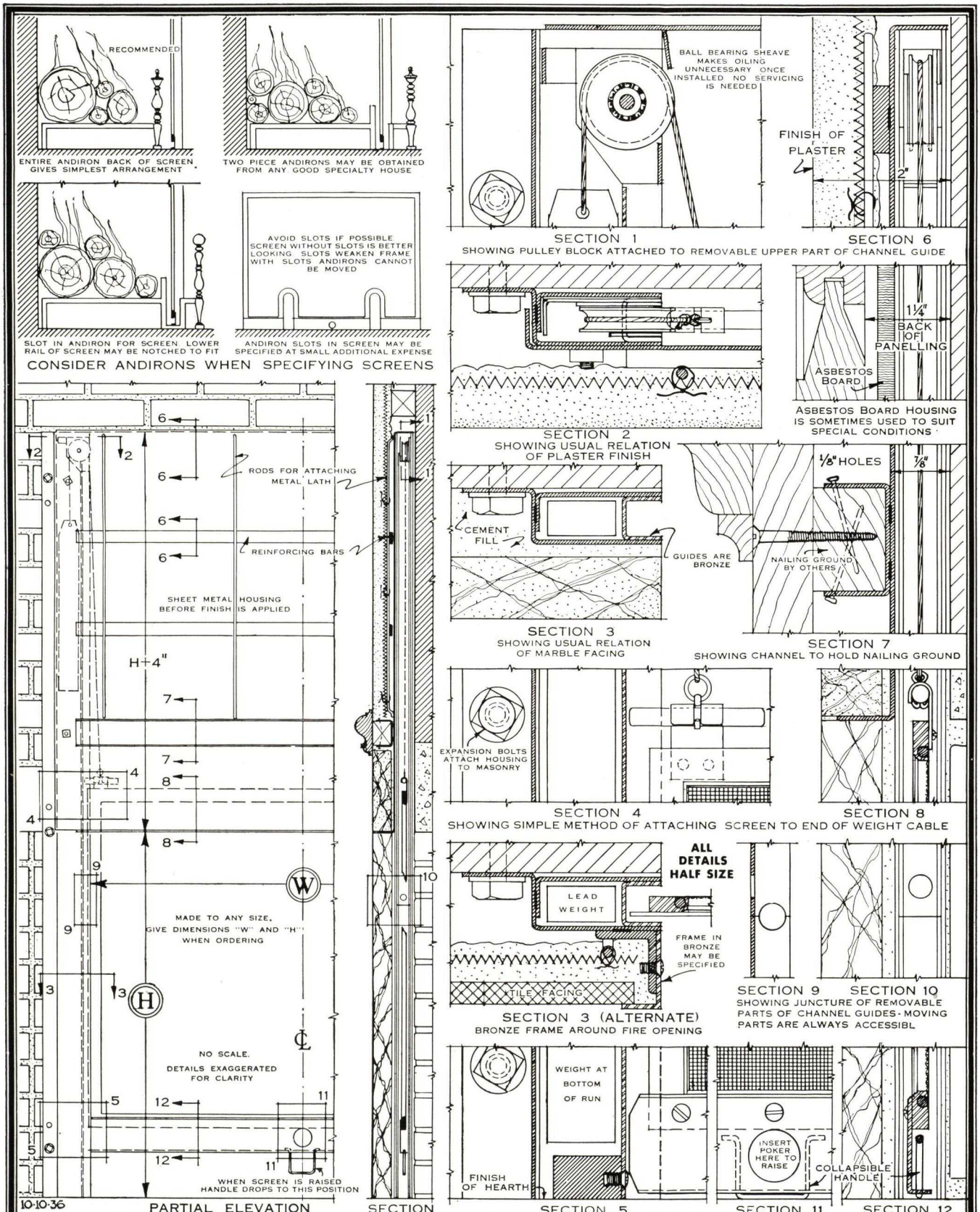
Announcing THE FYR-SLYD-SCREEN SPECIAL MODEL at NEW LOW PRICES

For Smaller Work of High Quality Where Price Counts—For Operators' Houses and for Apartments

The *Special Model* is striking in appearance with dull black steel-mesh screen and polished brass bottom rail. It will come within the budget of the most modest jobs. It has ball bearing pulleys and removable parts like the Deluxe model. Send for detail sheet and give sizes of fire-opening for quotation.

These sizes cost about 25% less: w. x h.: 30 x 30, 36 x 30; 42 x 36, 48 x 36 in. in both Deluxe and Special models

SPECIFICATION [Under / Masonry] This contractor shall furnish and set in each fireplace one Fyr-slyd-screen [Deluxe Model] [Special Model] as made by Fyr-Slyd-Screen, Inc., 101 Park Avenue, New York. Installation shall be according to manufacturer's details.



THE DELUXE MODEL AND ITS VARIOUS DETAILS

101 PARK AVENUE FYR-SLYD-SCREEN, INC. NEW YORK CITY

HEATILATOR COMPANY

SYRACUSE, N. Y.

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ATLANTA, GA., Jos. S. Cook, 8 Ridgeland Way, N. E.
BALTIMORE, MD., H. P. Supplee, 530 No. Charles Street
BOSTON, MASS., C. A. Todd, 83 Withington Road, Newtonville, Mass.
CARTHAGE, MO., Putnam & Jones
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COLUMBIA, MO., Putnam & Jones
DETROIT, MICH., George M. Scott, Box 115, Franklin, Mich.
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Convenient Warehouse Stocks Carried in Principal Cities—Distributed by Leading Building Supply Dealers

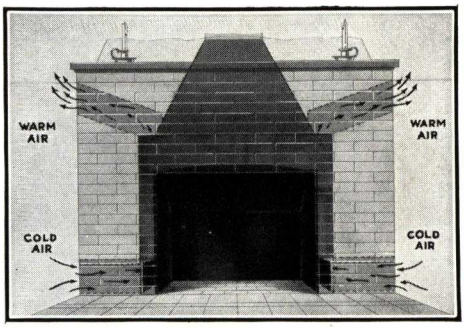
THE HEATILATOR FIREPLACE

Description

The Heatilator combines two functions which have been desired by architects, owners and builders for many years.

First—It is a welded steel form scientifically designed to assure perfect fireplace construction and a fireplace which will not smoke. It acts as a form around which all masonry is built to the flue, eliminating the necessity of constant supervision so often required for the ordinary fireplace construction. Any mason can lay up the fireplace around it, easily and quickly.

Second—The Heatilator improves the heating efficiency of the fireplace by adding a new source of circulated heat to the usual radiated heat. Designed on warm air furnace principles, it extends the zone of comfort to every corner of the room and even adjoining rooms. As a result, the open fireplace becomes a useful as well as decorative feature of the modern home.



Arrows indicate the passage of air through the heating chamber of the Heatilator. Here it is heated and then returned and circulated to every corner of the room and even adjoining rooms.

Increases Heating Efficiency

In the ordinary type of fireplace 90% of the heat is lost up the chimney. The only warmth is that radiated directly from the fire and even that is scarcely noticeable a few feet away. Not so with the Heatilator Fireplace. For by saving and circulating the heat previously wasted up the chimney, the Heatilator extends the zone of comfort throughout the room and adjacent, connecting rooms.

The double-walled firebox of the Heatilator is really a heating chamber which surrounds the fire at sides and back. Cold air is drawn into this chamber at floor level, or from below the floor. Here it is heated by contact with the chamber walls —then returned to the room. Where maximum warmth is desired, the volume of heat can be doubled by forcing the circulation of air through the Heatilator with small electric fans.

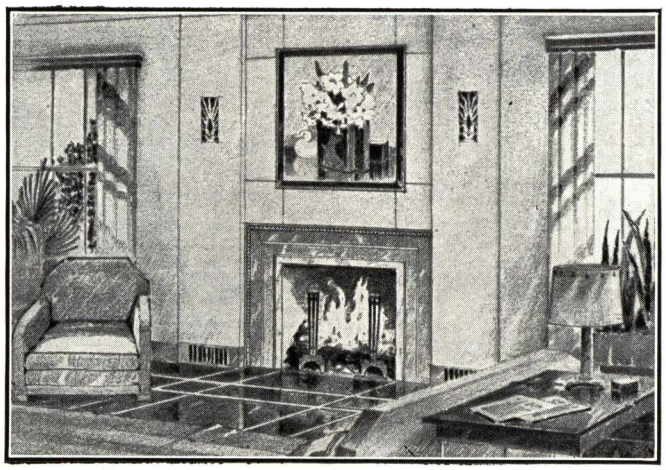
A Form for the Masonry

The Heatilator is not an addition to the fireplace—it is the fireplace itself. Only the decorative masonry is needed to complete the installation. Complete from floor to chimney flue, it forms the firebox, throat, downdraft shelf, and smoke dome, and includes a built-in damper. The fireplace opening is in correct proportion to the flue area—an unusually large downdraft shelf is provided—and the proper flue size is regulated by the Heatilator dome. No firebrick lining is required for the firebox.

Ideal for Homes, Camps, Basement Rooms

In mild climates, the Heatilator Fireplace is usually the only heating equipment necessary during the cooler seasons. For northern homes, it supplements the regular heating system with a real saving in spring and fall heating costs. For summer camps and cabins, it is almost indispensable. The Heatilator permits enjoyment of camp life weeks longer each year—and even on winter week ends. It also solves the difficult problem of heating basement recreation rooms—eliminating unsightly heating pipes and ceiling radiators and providing a quick source of heat when needed.

Heatilator Fireplace With Grilles Located in the Mantel Ends



An Interesting, Modern Fireplace With Mantel Flush With the Wall

No Limit to Mantel Design

Heatilator construction does not limit the architectural style of the fireplace or type of masonry that is used. The unit itself is practically hidden in the masonry. Only the intake and outlet grilles are visible and these may be made a decorative feature blending into the general design, or concealed in such a way as to leave the mantel face unchanged. Likewise the fireplace can be built flush with the wall, projecting into the room, across a corner or in any other location possible with the ordinary construction. use brick, stone, tile or other masonry as desired.

While the Heatilator provides a new degree of comfort and efficiency, it adds but comparatively little to the cost of the completed fireplace. There is a saving in materials that covers a large part of the unit cost. Less masonry is required; the mechanical designing is done and the builder is ready to start work with an actual saving in time and labor.

Heatilator Specifications

The Heatilator is made of the same high grade steel used in the manufacture of the best steel furnaces. The one-piece formed firebox and down-draft shelf, as well as all heating surfaces, are $\frac{3}{16}$-in. boiler plate to insure maximum durability. All welded seams have been eliminated at points of greatest service and the heavy construction makes extra reinforcing unnecessary. A simple, positive control for the damper eliminates mechanism or fixtures in the mantel.

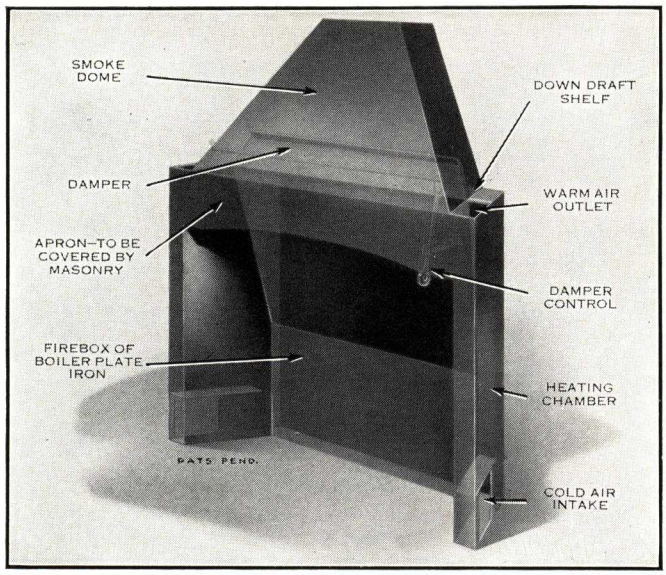
A complete blanket of rock wool insulating material is furnished with each unit for placing between the Heatilator and the masonry. This eliminates the waste of heat in the masonry or through crevices around the chimney. Its use speeds up construction and, by keeping the heat out of the masonry, helps to prevent drying checks or cracks to which all masonry is subject.

The insulating material also serves as an expansion cushion—absorbing any pressure that might be set up by the slight expansion of the metal when heated. There is less possibility of cracked masonry with the Heatilator than without it.

Wide Range of Sizes

No.	Finished width, in.	Opening †height, in.	Flue sizes, in.	Fuel capacity in.	Weight, lbs.
24H	23	24	8½x13	up to 16	166
28H	27	25	8½x13	up to 20	182
34H	33	26	8½x13	up to 27	245
39H	37	28	13 x13	up to 30	287
44H	42	31	13 x13	up to 33	404
50H	48	33	13 x18	up to 38	459
62H	60	36	13 x18	up to 50	701
74H	72	38½	18 x24	up to 62	920

†See dimension table on next page for arched opening height.



Phantom View Illustrates Heatilator Construction

Heating Capacity Ratings

Ratings are based on a 40° rise in temperature which will be easily obtained and maintained in the ordinary type of construction. No account has been taken of radiated heat. Heating capacity may be doubled by inserting electric fans in intake openings.

Heatilator size	Room capacity (natural circulation)	Room capacity (forced circulation)
24H	2250 cu. ft.	3700 cu. ft.
28H	3000 cu. ft.	6000 cu. ft.
34H	3500 cu. ft.	7000 cu. ft.
39H	4200 cu. ft.	8400 cu. ft.
44H	5000 cu. ft.	9500 cu. ft.
50H	5900 cu. ft.	10600 cu. ft.
62H	7000 cu. ft.	12600 cu. ft.
74H	9000 cu. ft.	16200 cu. ft.

Example: A 34H unit rated for 3500 cu. ft. room capacity would be equivalent to recommendation for a room 30x14x8 ft. or total room capacity of 3360 cu. ft.

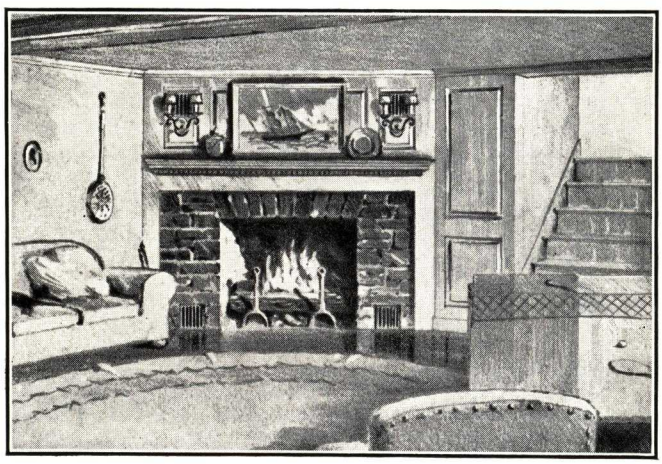
Note: The above heating capacity ratings do not alone determine the size Heatilator to be used. Other factors, such as relation of fireplace to size of room, space available for mantel, etc., should also be considered.

Architectural Service

Our Engineering Department will be glad to assist at any time with special Heatilator Fireplace designs and information, without obligation of course. Or write or telephone our representative in your territory, as listed on preceding page.

Heatilator Fireplaces are sold by leading building supply and lumber dealers everywhere. If your local dealer does not carry a unit in stock, ask him to order one for inspection. Prompt shipment will be made from factory or nearby warehouse.

A Typical Stone Fireplace for Summer Camp or Cabin



The Heatilator Solves the Heating Problem in Basement Rooms

HEATILATOR COMPANY

Heatilator Grilles for Intake and Outlet Openings

No. 16, 5x8

No. 20, 8x8

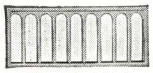
No. 21, 8x8

No. 22, 8x8
No. 40, 10x10

No. 23, 8x8

No. 25, 8x8

Grilles include metal frame to set in masonry to which grille face is attached.


No. 30, 12x5

No. 31, 5x12

No. 51, 8x12

Above grilles have cast iron faces except No. 25 which is stamped.

These grilles are designed for use with the Heatilator. In some fireplaces it is desirable to use the same style grille at both intakes and outlets. In others, a combination of two designs adds to the attractiveness of the installation. Specify 5x8-in. grilles for 24H unit; 8x8-in. or 5x12-in. for units 28H to 44H; 8x12-in. for 34H and larger; 10x10-in. for a 50H and larger.

The heating capacity of a Heatilator Fireplace can be doubled by forcing the circulation of air through the unit with electric fans. For homes and camps where the maximum heat is desired, grilles can be furnished with fans for installation at the cold air intakes. Grille and fan are completely assembled with electrical outlet connection. 60-cycle A.C. motors are standard equipment. Special motors on order.

Where special grille designs are desired, quotations and assistance will be gladly furnished on request.

HEATILATOR INSTALLATION DATA

Size of Fireplace and Foundation

Width of Fireplace—Add the width of the fireplace opening to the combined width of the two side posts or columns to obtain the over-all width of the fireplace and foundation.

Example: The 34H has a finished opening width of 33 in. Two side posts of 16½ in. each total 33 in. Thus the 33-in. opening + 33 in. for posts = 66 in. over-all fireplace width. This is the minimum width when space must be provided for an extra flue 8½x8½ in. An extra flue 8½x13 in. requires posts of 21 in. each, making the over-all fireplace width 75 in.

Depth of Fireplace—To the over-all depth of the Heatilator unit, add 4 in. for a single course of brick at back, 8 in. for a double course or 6 in. to 8 in. for stone. Add also 4 in. minimum facing for brick, 6 in. to 8 in. for stone. In addition, space for ½ in. of rock wool between metal and masonry at front and back must also be allowed.

Example: Depth of the 34H Heatilator from front to back is 20 in. + 4 in. for a single row back wall or brick + 4 in. brick facing + ½ in. for insulation wool at front and ½ in. at back = 29 in. minimum over-all depth of fireplace.

Location of Intake and Outlet Openings

Intakes—May be placed in the ends of the mantel, if mantel projects sufficiently; in the front of fireplace at floor level; in baseboards at sides of fireplace; or in adjoining rooms.

The most satisfactory plan is to take the cold air supply from inside the house in order to avoid drafts and unfavorable winds which might interfere with circulation. An outdoor supply is not recommended for this reason.

Outlets—May be located in the face or ends of the mantel, either above or below the mantel shelf; near the ceiling at front or sides; in the mantel shelf; or through the rear of the chimney to adjoining or upper rooms.

Where outlet grilles are placed some distance from outlets in the Heatilator, use asbestos covered metal pipes to conserve the heat and speed up circulation. In every case the warm air outlets in the masonry should be somewhat higher than the openings in the Heatilator itself. Passages for warm air should be equal in area to the Heatilator outlets. They should also be free of pockets, sharp turns or level runs.

Grilles Determine Post Size

Where 5x8 or 5x12-in. grilles are placed in the front of a brick fireplace, the minimum post size will be 12½ in.; for 8x8-in. grilles, the minimum post size will be 16½ in.; and for 10x10-in. grilles, 21 in. When stone or other materials are used, post size will vary accordingly. To locate 8x8-in. grilles in the ends of the fireplace, it is necessary to project the fireplace mantel 12½ to 13 in. into the room. To use 5x8 or 5x12-in. grilles in the ends requires 9½-in. projection into the room.

Size of Fireplace Flue

Opening at top of Heatilator dome indicates size of rectangular chimney flue required and is in correct proportion to area of fireplace opening. For chimneys less than 20 ft. in height or if unfavorable conditions exist, an oversize flue is recommended. Where round or oval flues are used, flue area should be at least as great if not greater than flue opening area in the Heatilator itself.

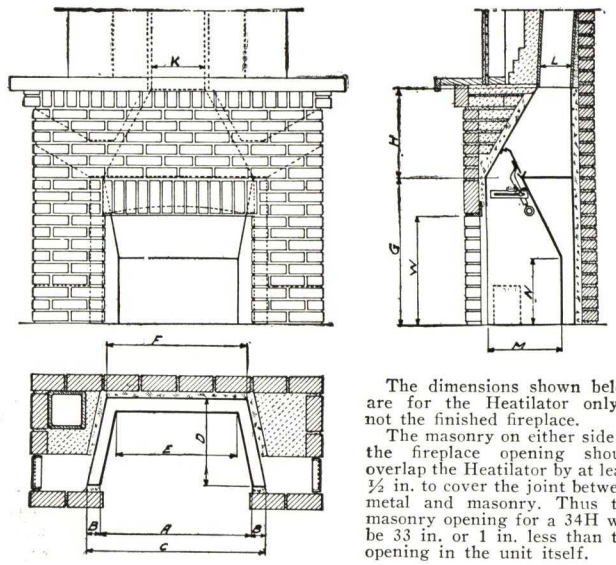
A separate tight flue with no other connections into it should be provided for each fireplace. Angles or turns of over 30° must be avoided. Where flues from heating plant or fireplace on a lower floor use the same chimney they should be so placed as to prevent interference with Heatilator air passages.

To Rebuild Fireplace Around Heatilator

The Heatilator can be installed in an existing fireplace if the construction of the mantel and chimney will permit an opening in the masonry large enough to admit the unit. At the same time, the chimney flue must be as large as required by the Heatilator to be used.

If the unit is to be installed from the front, the mantel and face of the masonry should be taken down, old firebrick and damper removed and the rough masonry cleaned up. Any obstructions should be removed and weak or uneven parts filled with cement. Allowance must be made for the rock wool. Air passages can then be provided, the unit set in place and the fireplace masonry rebuilt.

Heatilator Unit Dimensions



The dimensions shown below are for the Heatilator only—not the finished fireplace.

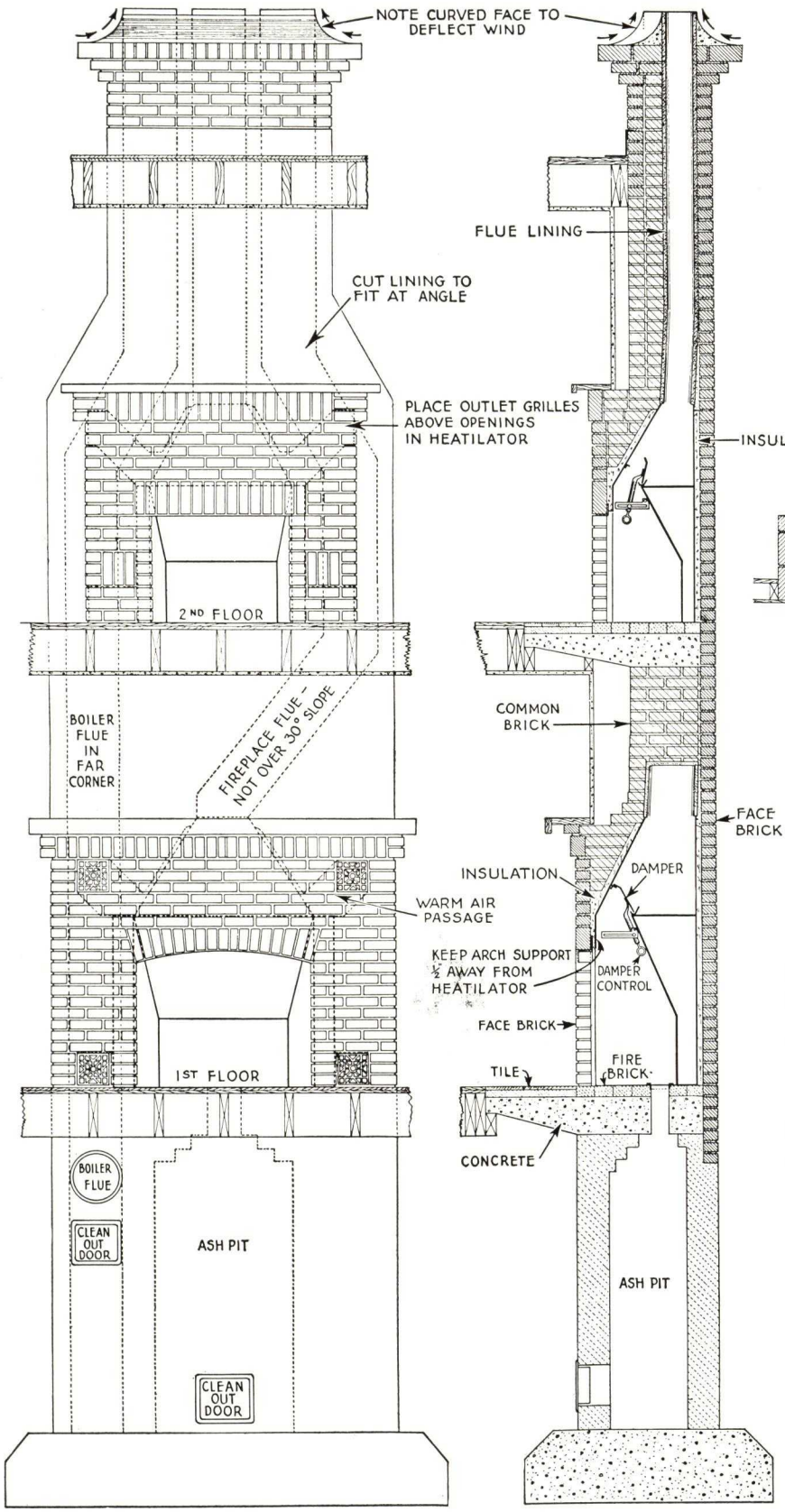
The masonry on either side of the fireplace opening should overlap the Heatilator by at least ½ in. to cover the joint between metal and masonry. Thus the masonry opening for a 34H will be 33 in. or 1 in. less than the opening in the unit itself.

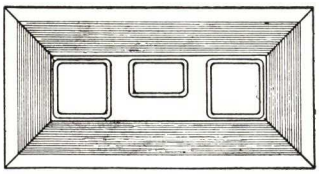
DIMENSIONS IN INCHES

Model	A	B	C	D	E	F	G	H	K	L	M	N	W
24H	24	3	30	18	16	21	31	16	12	8	15	13	24
28H	28	3	34	18	20	25	32	16	12	8	15	14	25
34H	34½	3	40½	20	27	32	33½	20	12	8	17	15	26
39H	39	4	47	21	32	38	36	20	12	12	17	17½	28
44H	44	5	54	25	32	40	42	24	12	12	20	17	31
50H	50	6	62	26	38	46	44	26	16	12	20	19	33
62H	62	8	78	28	50	64	48	28	16	12	22	22	36
74H	74	10	94	30	62	79	52½	28	24	16	24	22	38½

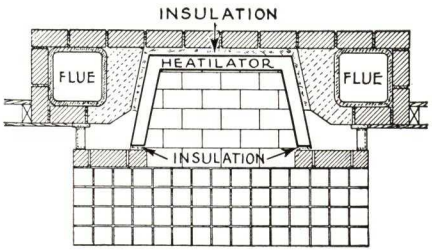
To obtain over-all height for arched opening, add the following to dimensions "W": 24H—⅞"; 28H—1¼"; 34H—1¼"; 39H—1½"; 44H—2⅛"; 50H—2⅝"; 62H—3⅛"; 74H—4⅞". Arched opening is slightly lower at sides than dimensions "W" above.

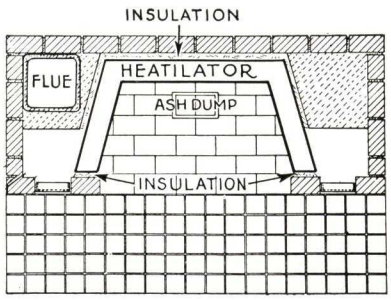
HEATILATOR FIREPLACE INSTALLATION DETAILS





DETAIL OF CHIMNEY TOP





Additional Heatilator information or assistance on special installations will be furnished upon request.

ESTABLISHED 1827

WM. H. JACKSON COMPANY

Mantels and Fireplace Equipment

16 East 52nd Street

NEW YORK, N. Y.

"Everything for the Fireplace"

Company

For more than 100 years—since 1827—Wm. H. Jackson Company has specialized in fireplace design, manufacture, installation and adornment. We offer a choice of products in this field, unsurpassed both as to quality and variety. These pages but hint at the range and scope of the Wm. H. Jackson Company's services. All items shown are regularly carried in stock.

Services

Wm. H. Jackson Company is ready at all times to cooperate with architects. Photographs of all items in our showrooms are available on request. We make up special mantels to the architect's design. We always have on hand a distinguished collection of genuine antiques. Whatever your fireplace problem, let us help you solve it.

Cretan Stone Mantels

Cretan stone is a hard, close-textured, durable stone, developed by and exclusive with Wm. H. Jackson Company. The perfect medium for the reproduction of fine antique stone mantels, it can be carved, tooled and chiseled. Cretan Stone contains *no* portland cement or plaster. Its moderate price is far below that of quarried limestone or caen stone. Our designs are authentic to the minutest detail, in most cases reproductions of originals in our collection. The Cretan Stone mantels shown on the following page are but three of more than 50 designs we offer.

Mantels

Our stock of marble, wood and stone mantels includes designs representative of the best work done in all the history of fireplace treatment. From Early Italian Renaissance, the continuity is complete through Louis XV, Regency, Louis XVI, Directoire, Empire down to modern design, and also includes the English Georgian, Adam and Regency. Our antique items are carefully selected by experts, and our reproductions are wholly authentic. Only the choicest marbles are used. The illustrations at right center and bottom of the page following indicate the range and authenticity of our products.

Franklin Stoves

Wm. H. Jackson Company carries a complete line of Franklin Stoves. Consult us on any special problem where any fireplace unit is desired.

Fire Screens

Regular screens in various sizes and styles are stock items. Fire Veil Curtain Screens made to fit each fireplace.

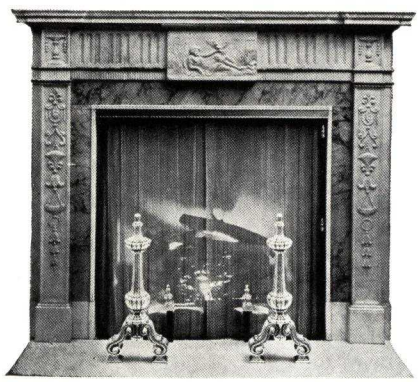
We have developed and continually improved a patented rolling screen for more than a decade. This screen is made of flexible transparent brass wire mesh which allows clear vision of the fire. It is operated by the manipulation of a noiseless chain. The screen rolls into an inconspicuous metal container, compact as a window shade. Each Jackson Rolling Screen is custom-built to fit the individual fireplace and can be concealed if desired.

Franklin Stove No. 964

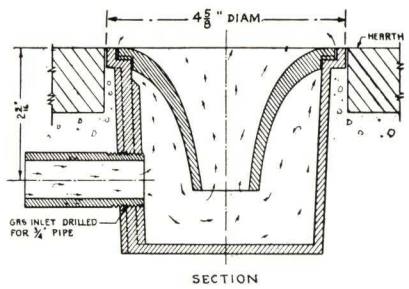
Other Products

Fireplace Fixtures — Andirons, coal hods, electric fires, fenders, fire tools, grates, hob grates, iron plaques and linings, wood holders and cove frames.

Garden Furnishings — In Marble and Stone: Benches, urns, well heads, fountains, pergolas, sundials, columns. Also Wrought Iron, Lead and Bronze pieces. We specialize in indoor and outdoor swimming pools of tile.

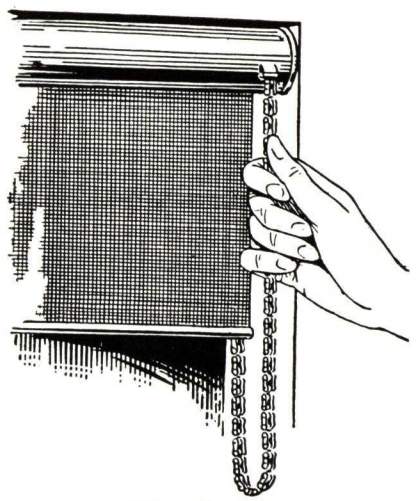


Curtain Screen



Jackson Log Lighter

Shown above is a sectional scale drawing of a fireplace accessory that is popular wherever gas is available. Generally flush-set in rear of the hearth, this small cast iron unit eliminates bother of kindling fire.

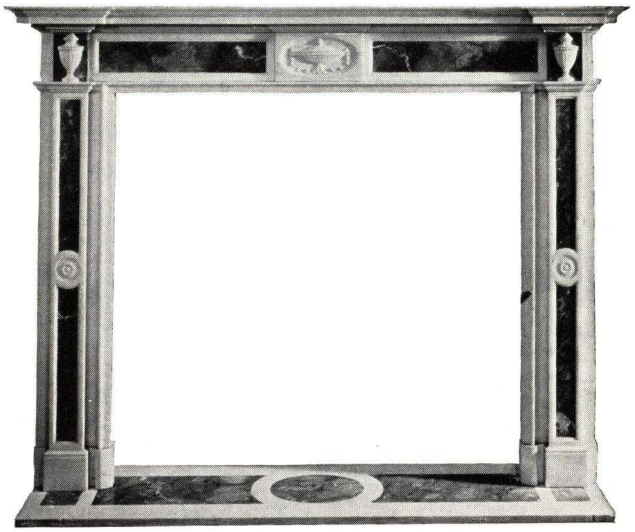


Rolling Screen

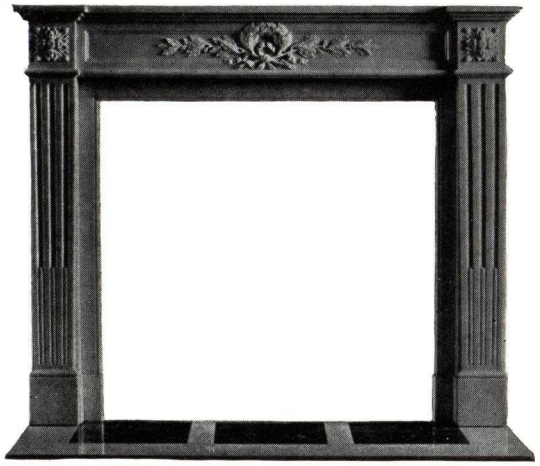
Antique Wood Mantel No. 38

Louis XV Cretan Stone Mantel No. 257

Cretan Stone Mantel No. 232



Adam Marble Mantel No. 201 D.S.



Louis XVI Marble Mantel No. 208 Blanc Clair

Tudor Cretan Stone Mantel No. 238

INDIANA FOUNDRY COMPANY

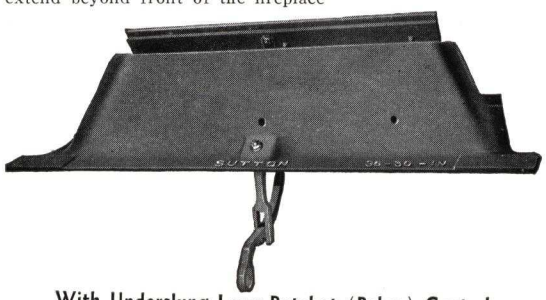
Manufacturers of Fireplace Dampers and Cast Iron Builders' Specialties

INDIANA, PA.

"SUTTON" DOME DAMPERS

With Underslung Short Ratchet (Poker) Control

In cases where face of mantel is tile or marble, or where owner does not wish to have the handle rod through front of the fireplace, it is advisable to install a "Sutton" Damper with ratchet control. Shutter is controlled by inserting a poker through opening in end of the ratchet lever, either pulling forward or pushing backward to open or close the shutter. Control is positive. Lever does not at any time extend beyond front of the fireplace

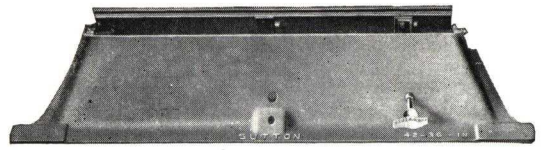


With Underslung Long Ratchet (Poker) Control

If a ratchet control type is preferred, we recommend the "Sutton" Damper with long ratchet control. Damper can then be set higher in fireplace, which is the best fireplace construction. On this type of damper, shutter is opened or closed by moving lever forward or back, by inserting a poker through opening in end of lever. Lever does not extend beyond front of the fireplace. Control of draft is positive and accurate

The "Sutton" Dome Damper is the type of damper you would choose if you were building a home of your own. It is truly a quality product. It is correct in design; the castings are full weight, clean and smooth; the domes are full height. The flanges on the front and sides are of ample width, and of sufficient strength to carry one course of brick. The high dome provides a smooth, properly formed metal throat for the fireplace. Being made of cast iron throughout, there are no sheet steel parts to rust through in a short length of time. Accurate control of the draft is insured by the positive action of the shutter, which will remain in the exact position in which it is placed.

Made with worm gear, short ratchet (poker control), and long ratchet (poker control) to meet any desired condition of fireplace construction.

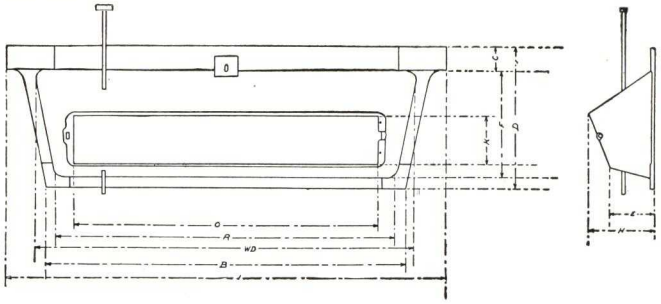


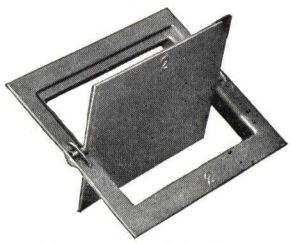
With Worm Gear Control

With this type of control, shutter is operated by a highly polished cast brass handle, which extends through front of the mantel, turning either to right or left to close or open the shutter. Handle is plainly marked which way to turn. If preferred, entire control can be located in center of damper instead of in right-hand side, as shown. Worm and gear never bind, as both are of open construction, with ample clearance allowed for expansion and contraction; they are self-cleaning, and cannot become fouled with soot

Cast Iron Cleanout Door

No.	Exact opening, in.	We'ght, lb.
30	5x 7	4¼
300	8x 8	7
31	8x10	7½
32	10x12	11
325	12x12	13
33	12x16	15½
34	14x20	28½
35	18x24	47
36	24x24	57½

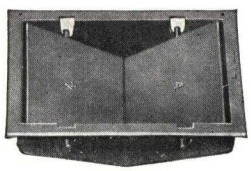




Tilting Type Ash Dump

Will close automatically after the ashes are dumped

No.	Frame, in.	Opening, in.	Weight, lb.
1	7 x 8¾	4⅝x 6⅜	2½
2	7 x10	5 x 8	3½
3	7¼x11¾	5½x10	5¼
5	9 x12	6¾x 9⅝	5⅜



Automatic Ash Dump No. 4

A sufficient weight of ashes, falling from above, causes tilting doors to open automatically, dropping ashes through to ash pit.

Frame, 6½x8½ in., opening, 5⅛x7¼ in., weight, 5 lb.

SPECIFICATIONS OF "SUTTON" DOME DAMPERS

No.	L, width of frame at front	*WD, width of dome at front	D, depth of frame	F, depth of dome	H, height of dome at front	B	R	O	C	K	E	Proper flue lining, exterior dimensions	Equivalent round flue, inside dimensions
124-W	30″	24″	13⅛″	10″	6¼″	21⅞″	20″	16⅞″	2¼″	4¾″	4¼″	8½″x8½″	8″
128-W	34″	28″	13⅛″	10″	6¼″	25¾″	24″	20¾″	2¼″	4¾″	4¼″	8½″x13″	10″
130-W	36″	30″	13⅛″	10″	6¼″	27¾″	26″	22¾″	2¼″	4¾″	4¼″	8½″x13″	10″
132-W	38″	32″	13⅛″	10″	6¼″	29¾″	28″	24⅝″	2¼″	4¾″	4¼″	8½″x13″	10″
134-W	40″	34″	13⅛″	10″	6¼″	31¾″	30″	26⅝″	2¼″	4¾″	4¼″	8½″x13″	10″
136-W	42″	36″	13⅛″	10″	6¼″	33¾″	32″	28⅝″	2¼″	4¾″	4¼″	13″x13″	12″
139-W	45″	39″	13⅛″	10″	6¼″	36¾″	35″	31½″	2¼″	4¾″	4¼″	13″x13″	12″
142-W	48″	42″	13⅛″	10″	6¼″	39½″	38″	34½″	2¼″	4¾″	4¼″	13″x13″	12″
146-W	52″	46″	13⅛″	10″	6¼″	43¼″	41½″	38⅛″	2¼″	4¾″	4¼″	13″x13″	12″
148-W	54″	48″	13⅛″	10″	6¼″	45¼″	43⅜″	40¼″	2¼″	4¾″	4¼″	13″x18″	15″
154-W	60″	54″	13⅛″	10″	6¼″	52⅜″	50″	47⅛″	2¼″	4¾″	4¼″	13″x18″	15″
160-W	66″	60″	13⅛″	10″	6¼″	58½″	56″	53⅛″	2¼″	4¾″	4¼″	18″x18″	18″
166-W	72″	66″	13⅛″	10″	6¼″	64½″	62″	59″	2¼″	4¾″	4¼″	18″x18″	18″
172-W	78″	72″	13⅛″	10″	6¼″	70½″	68″	65″	2¼″	4¾″	4¼″	18″x18″	18″

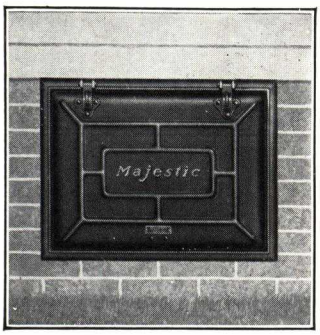
*When selecting damper of proper size for use in a fireplace, refer to column "WD," and select damper which has the WD dimension nearest to width of fireplace opening. For instance, if width of fireplace opening is 36 in., select a No. 136 W damper. However, if width of fireplace opening falls between any two WD dimensions shown above, select damper with WD dimension *next larger* than width of fireplace opening—for instance, for fireplace opening which measures 40 in. wide, select a No. 142 W damper.

THE MAJESTIC COMPANY

HUNTINGTON, IND.

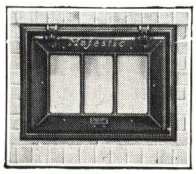
Manufacturers of Majestic Foundation Coal Chutes, Grade Line and Store Chutes, Circulator Fireplaces, Fireplace Dome Dampers, Milk and Package Receivers, Portable Incinerators, Garage Doors, Garage Door Hardware, Underground and Built-in Garbage Receivers, Built-in Mail Boxes, Radiator Cabinet Covers, Access Doors, Ash Pit Doors, Ash Dumps, Bell Traps, Cistern Rings and Covers, Flue Thimbles, Foundation Grates, Steel Basement Sash and miscellaneous metal building specialties and Heating Equipment.

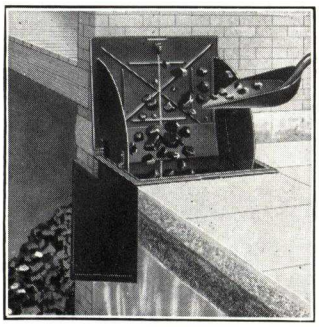
Through almost a half century of rendering high quality service at a reasonable cost, Majestic Products have won the preference of discriminating architects, and are distributed through all leading hardware jobbers, hardware dealers and lumber and building supply dealers.



Majestic Coal Chute Nos. M101 and M203

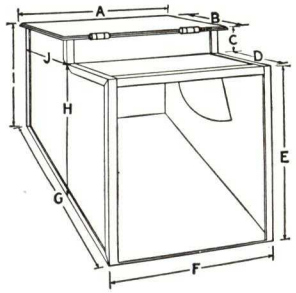
Nos. M10 and M20

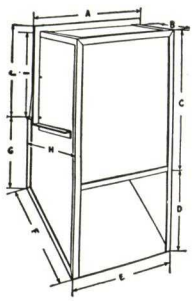




Majestic Grade Line Chutes

Dimension Diagram of Majestic Grade Line Coal Chutes





Dimension Diagram of Majestic Store Chute

Majestic Coal Chutes

Majestic Coal Chutes give needed protection to the building when coal is being delivered. Their sightliness, sturdy construction, permanency and convenience enhance the value of any building, and save their initial cost many times. They are made in solid steel and glass panel door styles, with straight or sloping bodies and in two sizes. A Majestic for every need. Consult tables.

Construction—Doors are pressed from heavy steel and treated to resist rust. Frames and hinges are made of malleable iron, except for No. 550 frame, which is rolled steel electric welded and the No. 50 which is cast semi steel. (No. 550 and No. 50 are the same dimensions as No. M500 but built for low cost housing market.) Bodies are formed of sheet steel reinforced at points of strain and electric welded.

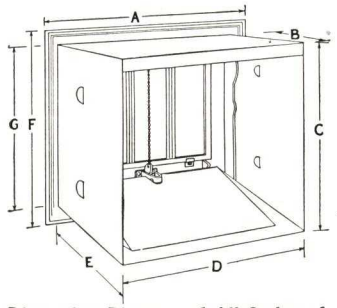
Glass panel styles have ¼-in. plate glass set in ½-in. angle iron frame, and packed with rubber strips instead of putty. All chutes receive thorough painting with black asphaltum.

SOLID DOORS

No.	Hopper	Rough wall opening		
		Wide, in.	High, in.	Deep, in.
M101B	yes	23	18	12
M101D	no	23	18	12
M203B	yes	32	23	17
M203D	no	32	23	17
M500	no	23	18	8
M520	no	32	22	12

PANEL DOORS

No.	Hopper	Rough wall opening		
		Wide, in.	High, in.	Deep, in.
M10A	yes	23	18	12
M10C	no	23	18	12
M20A	yes	32	23	17
M20C	no	32	23	17
M600	no	23	18	8
M620	no	32	22	12



Dimension Diagram of All Styles of Majestic Coal Windows

DIMENSIONS IN INCHES

No.	A	B	C	D	E	F	G
M101	24⅛	12	18¼	21¾	12½	18⅛	15½
M203	33	17	24¾	29½	17½	23½	20½
M500	24⅛	9	15½	21¾	9	18⅛	15½
M520	33	12	20½	29½	12	23½	20½
M 10	24⅛	12	18¼	21¾	12½	18⅛	15½
M 20	33	17	24¾	29½	17½	23½	20½
M600	24⅛	9	15½	21¾	9	18⅛	15½
M620	33	12	20½	29½	12	23½	20½

Majestic Grade Line Chutes

Majestic Grade Line Chute is designed for buildings having little or no foundation above the ground. A door protects building when open and hopper and shield keep coal from scattering. Locks automatically when closed.

GRADE LINE CHUTES

With Malleable Iron Doors and Frames

No.	Door opening, in.	Rough wall opening, in.	
		Wide	High
M16	23¼ x 18¼	25	25
M18	29 x 24	31	31

With Pressed Steel Door and Cast Semi-steel Frame

M14	20½ x 14½	23	23

Construction—Frame, door and hinges are of certified malleable iron, with solid brass pins; body of heavy steel, reinforced with angle iron. Door fits snugly over top of the frame when closed. Waterproofing ridge around the inside edge of frame, gives an absolutely watertight job.

No. M-14—This is an inexpensive model, designed especially for small residences, where there is little chance of heavy trucking or where coal chute is desired in the attached garage. The door, which provides an ample opening, is heavy pressed steel, frame is of durable cast semi-steel and body of 16-gauge sheet steel reinforced with angle iron.

DIMENSIONS IN INCHES

No.	A	B	C	D	E	F	G	H	I	J
M16	26	21	6	15½	24½	24¼	36½	19	18¾	19¼
M18	31¾	27	6	17	31	31	45	24	21½	25¼
M14	24	18	6	15½	22½	22½	34¼	16	15¾	16

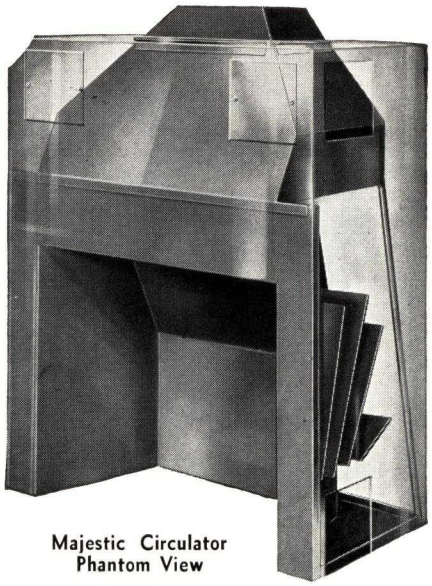
Majestic Store Chutes

The Majestic Store Coal Chute is designed particularly for store and office buildings, where first floor is on a line with sidewalk or an alley. Eliminates dangerous sidewalk coalhole and troublesome areaway.

Construction—Same as Grade Line Chute, except pressed steel door. Can be supplied on special order with duplex bodies so that coal can be discharged either under the sidewalk or in the basement.

DIMENSIONS IN INCHES

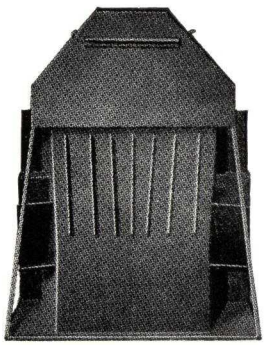
No.	A	B	C	D	E	F	G	H	I	J
M12	25	11½	26⅜	15¼	23	19½	13	15½	17	18
M15	33½	11½	30	16	30⅞	19½	13	15½	21¼	22½



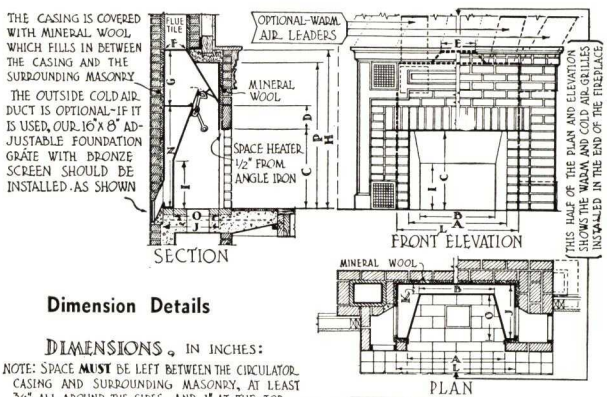
Majestic Circulator Phantom View

Continuous welded steel heating-fins insure heat conductivity and increase heating surface area as well as serve as ducts in positively directing cool air inflow at varying rate over the different heat-generating surfaces.

Paneled openings provide for air intake and outlets at either front, side or top. Note also how heat of smoke chamber is utilized.



Majestic Circulator. Rear View with Casing Removed Showing "Radiant Blades" Construction



Dimension Details

DIMENSIONS, IN INCHES:

NOTE: SPACE **MUST** BE LEFT BETWEEN THE CIRCULATOR CASING AND SURROUNDING MASONRY, AT LEAST 3/4" ALL AROUND THE SIDES AND 1" AT THE TOP.

SIZE	A	B	C	D	E	F	G	H	I	J	K	L	N	O	P	WARM AIR GRILLES	COLD AIR GRILLES
28	28	20	26	8	12	8	16	50	15	19	4	36	34	15	46	TWO-5x8	TWO-8x8
34	34	25	28	8	12	8	19	55	16	20	4	42	36	16	51	TWO-8x8	TWO-8x10
40	40	31	30	8	12	12	22	60	17	21	4	48	38	17	56	TWO-8x8	TWO-8x10
46	46	36	32	8	12	12	25	65	18	22	4	54	40	18	61	TWO-8x10	TWO-10x10
52	52	42	34	8	16	12	27	69	19	23	4	60	42	19	65	TWO-10x10	TWO-10x12

Basket Grate

Chimney Ornament

Majestic Circulator Fireplaces

Designed to Heat Like a Furnace

In a new adaptation of "convectional heating" as used in the modern warm air furnace, Majestic Engineers have provided the Majestic Circulator Fireplace with approximately 91% more heat generating surface by means of "Radiant Blades" solidly welded to the firebox.

Features—Adapted to any mantel design. Provides absolute freedom from smoke. Up to 400% more heat from any fuel than old type fireplace. Circulates warm air in every part of the room. Sufficient heat for whole house where climate is mild. Cold air taken from room or outside.

All-steel construction, electric welded. Easily installed by any experienced mason in new or old fireplaces.

SPECIFICATIONS

Size	Opening, in.		Over-all dimensions, in.			Flue size, in.	Room capacity average construction	B.t.u. rating
	Wide	High	High	Wide	Deep			
28	28	26	50	36	19	8½x13	3100 cu. ft.	19,600
34	34	28	55	42	20	8½x13	3850 cu. ft.	23,600
40	40	30	60	48	21	13 x13	4600 cu. ft.	28,000
46	46	32	65	54	22	13 x13	5350 cu. ft.	32,200
52	52	34	69	60	23	13 x18	6100 cu. ft.	36,400

How to Figure Size of Circulator Needed

First, measure outside doors and windows of the room in which Circulator is to be built (include frames). Then measure surface of outside walls and subtract from this area of windows and doors, leaving net wall. Finally, measure the area ceiling, provided there are unheated rooms, or no rooms above, and determine cubical contents by multiplying area of ceiling by height of ceiling. Next make the following computations:

(1) Multiply square feet of glass and door surface by 44.
(2) Multiply square feet of net wall surface by factor in table.
(3) Multiply square feet of ceiling area by factor in table.
(4) Multiply cubical contents of room by 2.

Add together results as found above and select Circulator that has a B.t.u. rating closest to the total. For checking and quick calculation the room capacity rating in specifications may be used.

Table of Construction

	Factors
Wall	
(1) Frame construction, siding, sheathing, lath and plaster	10
(2) Frame construction as above, insulated	3
(3) Frame, brick, veneer, lath and plaster	11
(4) 8-in. brick wall, plastered inside	18
(5) 12-in. brick wall, plastered inside	14
Ceiling	Factors
(6) Ceiling, lath and plastered, no floor above	13
(7) Ceiling, lath and plastered, tight floor above	11
(8) Roof, rafters exposed sheathing, shingles	23

These factors based on 40° temperature rise.

Note to Architects

The ratings of Majestic Circulator Fireplaces shown in tables are based on accurately controlled tests under actual heating conditions. Due to the wide variation in types of house construction, the ratings are necessarily broad, but on the safe side.

The room where tests were conducted had cubics of 3476. Heat loss was 18,750 B.t.u. at 0° F. outside and 70° inside. 80 c.f.m. of additional infiltration was provided and measured through controlled openings. Wood with B.t.u. content of 9000 was used as fuel, carefully weighed. An average combustion rate of 12 lbs. was maintained during the test.

Velocities at warm air outlets reached 300 f.p.m. maximum at a temperature of 290° F. Average velocities were calculated to be 210 f.p.m. at 190° F. During the test room temperature was raised 30° F. per hour. 9420 cu. ft. of air was discharged at the grilles giving an air change of 2.7.

Formula used:

$$\text{c.f.m.} = \frac{\text{B.t.u.} \times 55}{\text{tr} \times 60} \qquad \text{B.t.u.} = \frac{\text{tr} \times \text{c.f.m.} \times 60}{55} \qquad \text{tr} = \frac{\text{B.t.u.} \times 55}{\text{c.f.m.} \times 60}$$

Majestic Chimney Ornament

This artistic ornament is made of cast semi-steel finished with clear rust resisting finish.

No. 1 Shipping weight, each 7 lbs. Length, 36 in. Code—Ornate.

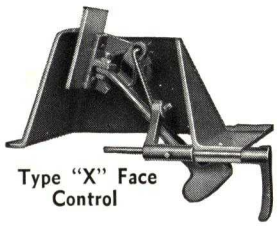
Majestic Basket Grate

The Majestic Basket Grate is a well designed grate especially made for Circulator Fireplaces. May of course, be used in any fireplace.

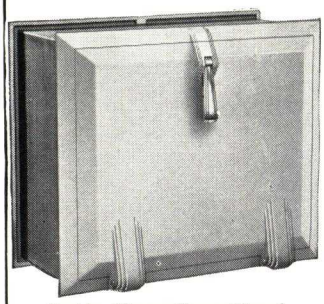
No.	Width, in.			Shipping weight, lb.	Code
	Front	Back	Depth		
122	20	10	15	47	Opal
128	26	16	15	60	Open
134	32	22	15	73	Opine
140	38	28	15	86	Optic
146	44	34	15	99	Opus
152	48	40	15	112	Opium

Majestic Fireplace Damper
Showing valve, large bearings and counterbalance arm

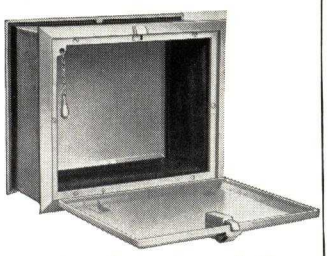
Chain Control Damper Series "C"



Type "X" Face Control



Inside View—Door Closed

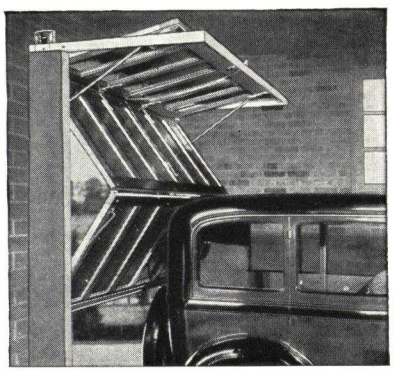


Door Open—forms shelf

Milk and Package Receiver

Majestic No. 1 Portable Gas Fired Incinerator

Majestic Garage Door Hardware



Majestic Roll-N-Fold Garage Door

Majestic Fireplace Dampers

The Quality Line—The Majestic Damper facilitates construction, operates easily and provides perfect draft control. The lintel is integral with damper frame, establishing the correct damper placement and height of fireplace throat.

Variable adjustment. Valve is held in place by a simple friction bearing. Operating lever is out of sight on standard models but is easily reached with poker. Face operation by means of a lever is available in "Type X" at no extra cost.

Valve is hinged at back, which provides greatest effective throat area, aiding the smoke shelf in turning the down-draft back up the chimney.

Drawings and instructions for insuring construction of perfect fireplace furnished with each damper.

SIZES AND DIMENSIONS OF MAJESTIC FIREPLACE DAMPERS

Damper No.....	24-26	28-30	32-34	36-38	40-42	44-46	48-50	52-54	58-60
Length of lintel, in.	28¾	32¾	36¾	40¾	44¾	48¾	52¾	56¾	62¾
Length at back, in.	25¾	29¾	33¾	37¾	41¾	45¾	49¾	53¾	59¾
Length of valve, in.	20	24	28	32	36	40	44	48	54

Finished opening:																			
Width, in.....	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54		58	60	
Height, in.....	28	29	30	30	30	31	31	31	31	32	32	32	32	32	32		32	32	
Firebox depth, in...	16	16	17	17	18	18	19	19	20	20	21	21	22	22	23		23	24	
Flue size, in.....	8x8	8x12				12x12						12x16			12x18		12x18		

The Special Line—Series S—For low-cost needs. Durable cast semi-steel body. Furnished with or without integral lintel. Tight fitting heavy steel plate valve. Poker control standard. This damper also furnished without lintel and chain with control for existing fireplaces. Face or chain control furnished at extra cost.

SIZES AND DIMENSIONS OF MAJESTIC SPECIAL FIREPLACE DAMPER

Length of lintel, in.	½ in. less than schedule given above
Length at back, in.	¼ in. less than schedule given above
Length of valve, in.	1½ in. more than schedule given above

Majestic Milk and Package Receivers

The Majestic Milk and Package Receiver is essential to the *modern kitchen.*

Model "S" is in three sizes and consists of two cast semi-steel doors and frames connected together with a telescoping steel body.

Model "W" consists of the doors and frames only, for built-in compartments.

Space-saving, drop doors are insulated. Outside door locks automatically after deliveries. Standard finish is baked-on white enamel with chromium plated handles.

Outside dimensions of all models: frames 15¾ in. wide, 13½ in. high; wall opening required 14½x11 in. Model "S" made in three body depths; S-10 adjustable to walls from 5 to 8 in. thick; S-20 from 8 to 14 in.; S-30 from 14 to 22 in. Special depth bodies on specification.

Majestic Incinerators

The Majestic Incinerator provides a safe and sanitary method of disposing of wet or dry garbage, trash and refuse. Eliminates a fire hazard—adds to convenience, safety and health of the home.

Economical and efficient to operate. The chimney helps dry the wet refuse. Only a few cents a week will supply gas to complete drying and consume the charge. Constructed of cast semi-steel where subjected to greatest heat. Casings are of sheet steel and finished in heat-resisting materials. Attractive and substantial.

No.	Capacity, bu.	Height over all, in.	Diam., in.	Flue, in.	Gas input per hr., ft.	Ship wt., lb.
1	3	36	24	8	50	270
10	3	44	24	8		375

The No. 10 is a coal or wood burning incinerator.

Majestic Garage Doors

Majestic Roll-N-Fold Garage Door provides modern upward-action—out-of-the-way, clears ice and snow—saves space. Operates easily. Opens automatically either by manual control or inexpensive electric release. Control switches may be placed on drive or in house. Smooth trouble-free counterbalance insures easy closure. Built throughout for long, carefree service and in sizes for residential and small commercial applications.

Full details upon request.

Majestic Garage Door Hardware

Majestic Garage Door Hardware converts old or new garage doors into the modern, convenient upward-action at a moderate price. Operated by counterbalance weights—boxes furnished may be filled with sand or sash weights and located any place in the garage.

Set will handle any door up to and including 8 ft. wide, 8 ft. high, and includes everything but stops.

Detailed bulletins on all items described sent upon request.

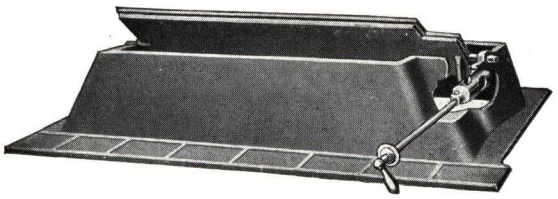
PEERLESS MANUFACTURING CORP., INC.

MANUFACTURERS OF

Fireplace Equipment, Building Specialties, Gas Heaters and Circulators
Gas Hot Plates, Gas Conversion Burners, Automatic Coal Stokers

LOUISVILLE, KY.

PEERLESS FIREPLACE DAMPERS — DOME TYPE



Peerless Damper with Rotary Control

The Fireplace is here to stay—more popular today than ever before. In Colonial days the fireplace builder used his own judgment as to the opening of the throat—and was often wrong, resulting, of course, in smoky fireplaces.

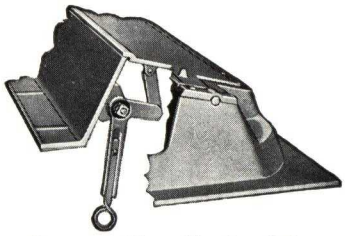
Today there need be no guessing about the throat opening because with the use of a Peerless Dome Damper the correct throat opening is assured.

Choice of Three Types of Control

Rotary Control—Damper door is opened and closed from the face of the mantel by a small, easy to turn, handle—the only visible part of the operating mechanism. This handle is connected to an iron rod, 24 in. long (may be cut down if necessary) on which a worm attachment is fastened, this part engages with a lug on the door. (See illustration above.)

Poker Control—Cast iron with a "loop" end which allows the use of a poker for opening or closing. Gives six different "open" positions. The lever does not extend out in front of the fireplace, thus permitting this type of damper to be used in "arch top" or "stone projecting" fireplaces. Adjustable handle. (See illustration to right.)

Chain Control—Consists of two chains fastened to door. One has letter "O" fastened to end. Pull "O" to open. Pull letter "S," fastened to end of other chain for shutting. (Not illustrated.)



Cut-away View Showing Poker Control

Peerless Features

(1) Peerless dampers are correctly proportioned and scientifically designed.

(2) The paneled front flange is made sufficiently strong and wide enough to support the fireplace arch without the use of angle iron or lintel.

(3) Time and labor saved; eliminates necessity of building up brick throat.

(4) The Peerless Dome assures correct throat shape and size.

(5) Damper door is removable, permitting access to the flue for cleaning.

(6) Damper door is securely held in position, open or closed, by improved simple, rugged and foolproof rotary or poker control.

(7) Operating mechanism is such that it may be adjusted either before or after the damper is installed.

(8) Treated with a battleship gray coating of rust-resisting materials.

If you have not already tried a Peerless Damper install one on the next job. You will be extremely satisfied with the results—Because:

There are no back-drafts. Perfect operation cuts out all unhealthful drafts. Heat loss and smoke are eliminated. Air conditioning demands Peerless Dampers as an aid to the efficient operation of the air conditioning installation. Seals the chimney when not in use.

Peerless Dampers wear a lifetime—and their cost is repaid many times by saving in fuel, due to proper burning.

SPECIFICATIONS OF PEERLESS DOME DAMPERS—All TYPES OF CONTROLS

(*Important:* Specify Type of Control Desired, when Ordering)

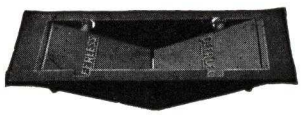
No. and size of damper	Width of fireplace opening, in.	Over-all dimensions at base of damper, in.			Dimensions of throat opening at base of damper, in.			Height of dome at front, in.	Size of flue recommended, in.	Equivalent in round flue construction, in.	Approximate shipping weight each, lbs.
		Width at front	Width at rear	Depth	Width at front	Width at rear	Depth				
B-24	24	28	24	13¾	24	21	9¾	5	8½ x 8½	8	32
B-28	28	32	28	13¾	28	25	9¾	5	8½ x 13	10	37
B-30	30	34	30	13¾	30	26	9¾	5	8½ x 13	10	38
B-33	33	37	33	13¾	33	30	9¾	5	8½ x 13	10	40
B-36	36	40	36	13¾	36	34	10	5	13 x 13	12	47
B-42	42	46	41½	13¾	42	39	10	5	13 x 13	12	53
B-48	48	52	47½	13¾	48	45	10	5	13 x 18	15	59
B-54	54	58½	51	15¼	54	48	12	6½	13 x 18	15	76
B-60	60	64	55½	16½	59	53	12	6½	18 x 18	18	100
*B-68	68	72	70	19¼	67	67	14¾	8½	18 x 18	18	200

*Chain control only.

Be Safe—Satisfy your client—Specify "Peerless"

Ash Dumps

No. 8 Plain
Dumped by means of poker



No. 9 Automatic
Weighted doors dump automatically

PEERLESS ASH DUMPS

No.	Outside measurements, in.	Inside measurements, in.	Approximate shipping wt., each, lbs.
8	7 x 10	5 x 8	3
	9 x 11	7 x 10	4¾
9	7 x 10	5 x 8	4½
	9 x 11	7 x 10	7

When ordering—use outside measurements.
Finish: Heavy coat of battleship gray enamel.

Ash Pit Doors

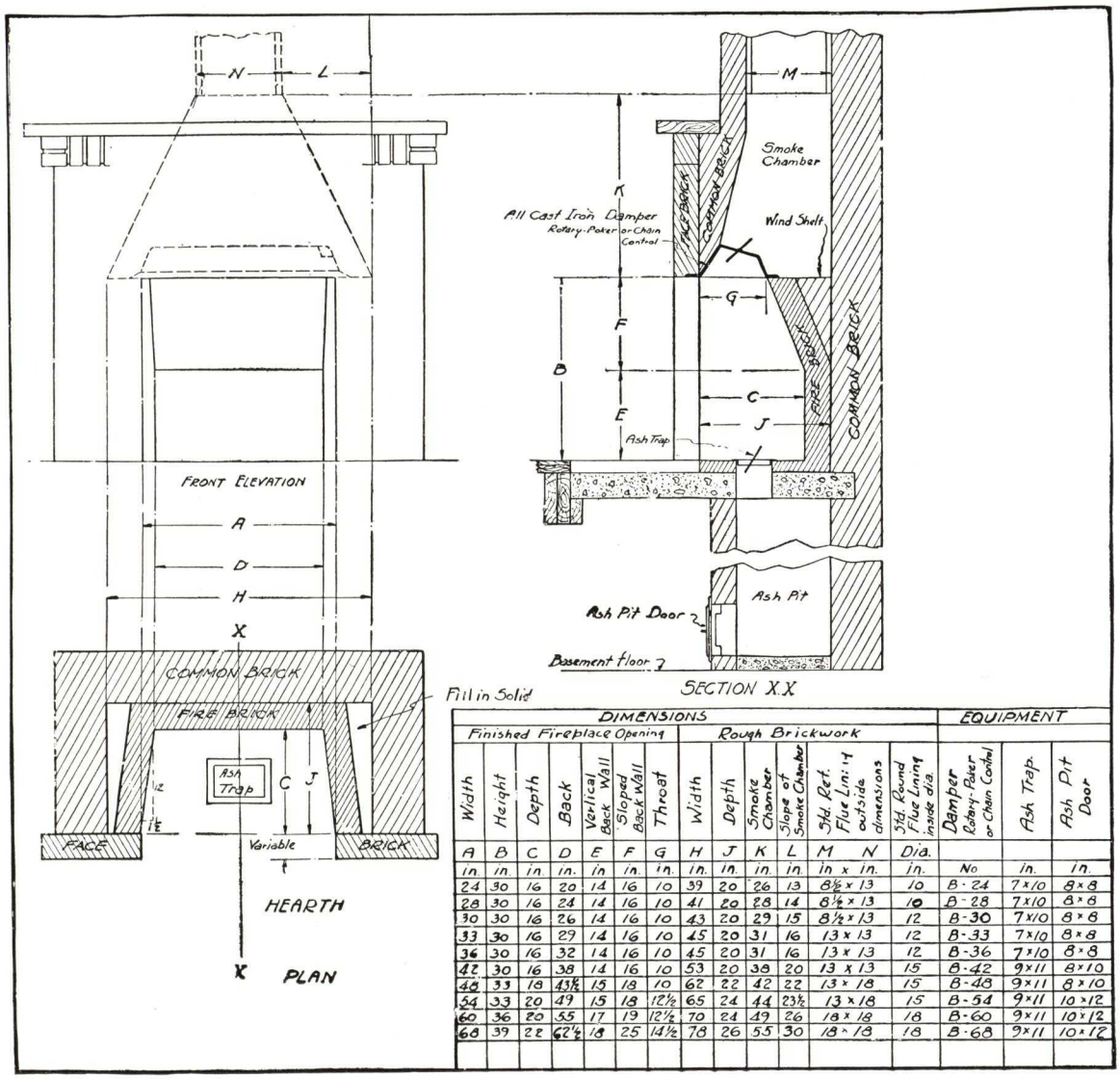
No. 3

Door opening size, in.	Approximate shipping weight, each, lbs.
5 x 7	5
8 x 8	7
8 x 10	9
10 x 12	10
12 x 16	16
14 x 20	22
16 x 24	33

Finish: Heavy coat of battleship gray enamel.

FIREPLACE CONSTRUCTION WITH PEERLESS DAMPER, DUMP AND ASH PIT DOOR

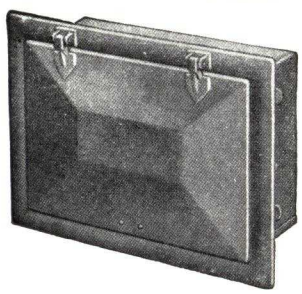
In order that satisfactory results may be obtained from an open fireplace, it is essential (1) that the flue have the proper area, (2) that the throat be correctly proportioned and located, (3) that a properly constructed smoke shelf and chamber be provided, (4) that the chimney be carried high enough to avoid interference with the draft, and (5) that the shape of the fireplace be such as to direct a maximum amount of radiated heat into the room.



DIMENSIONS														EQUIPMENT		
Finished Fireplace Opening							Rough Brickwork									
Width	Height	Depth	Back	Vertical Back Wall	Sloped Back Wall	Throat	Width	Depth	Smoke Chamber	Slope of Smoke Chamber	Std. Rect. Flue Lining outside dimensions	Std. Round Flue Lining inside dia.		Damper Rotary-Poker or Chain Control	Ash Trap	Ash Pit Door
A	B	C	D	E	F	G	H	J	K	L	M N	Dia.				
in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in. x in.	in.		No.	in.	in.
24	30	16	20	14	16	10	39	20	26	13	8½ x 13	10		B-24	7x10	8x8
28	30	16	24	14	16	10	41	20	28	14	8½ x 13	10		B-28	7x10	8x8
30	30	16	26	14	16	10	43	20	29	15	8½ x 13	12		B-30	7x10	8x8
33	30	16	29	14	16	10	45	20	31	16	13 x 13	12		B-33	7x10	8x8
36	30	16	32	14	16	10	45	20	31	16	13 x 13	12		B-36	7x10	8x8
42	30	16	38	14	16	10	53	20	38	20	13 x 13	15		B-42	9x11	8x10
48	33	18	43½	15	18	10	62	22	42	22	13 x 18	15		B-48	9x11	8x10
54	33	20	49	15	18	12½	65	24	44	23½	13 x 18	15		B-54	9x11	10x12
60	36	20	55	17	19	12½	70	24	49	26	18 x 18	18		B-60	9x11	10x12
68	39	22	62½	18	25	14½	78	26	55	30	18 x 18	18		B-68	9x11	10x12

COAL WINDOW NO. 5

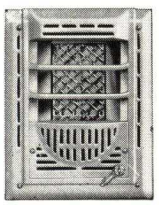
Finish—Black Japan



Constructed of heavy gauge steel. Malleable iron hinges. Brass hinge pins. Heavy cast iron catch that can be opened only from the inside. Slotted hinges hold door in position when open — cannot drop.

For rough wall openings 23 in. wide, 17 in. high, and walls 9 in. deep or more. Outside of frame 26½ in. wide, 20¼ in. high.

PEERLESS WALL INSERT GAS HEATERS



The ideal heater for bathrooms, halls, or other places where floor space is limited. Easily installed in new or existing buildings without costly preparation. No floor space required. Approved by American Gas Association.

Finished in any shade of enamel to match Standard or Crane colors. Made in 2, 3, 4, 5 double radiant capacities.

Write for complete literature.

PORTLAND STOVE FOUNDRY COMPANY

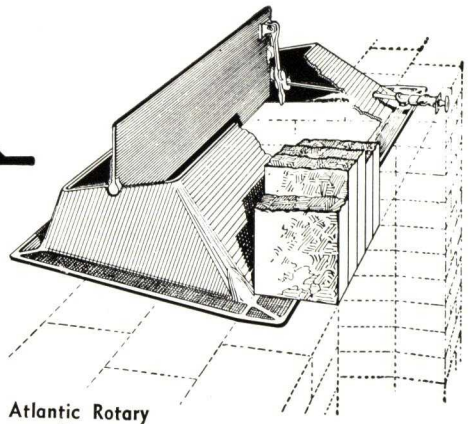
Fireplace Dampers and Throats

PORTLAND, MAINE

Products

The Portland line covers a variety of types of Cast Iron Dampers, Cleanout Doors and Ash Dumps, Tip and Slide Dampers, etc. Dampers are optionally equipped with rotary or poker control devices. Castings are of high quality and lids are fitted for tight closing. The designs incorporate many original features.

Lids of *all dampers* are easily removed without disturbing the masonry.



Atlantic Rotary Type

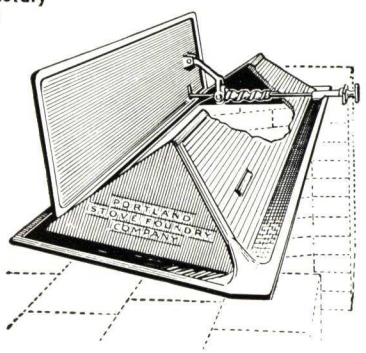
Atlantic Rotary Control Damper

The Atlantic Rotary Control Damper is operated by turning a small cast brass handle, located in a choice of two positions—either extending through face brick or under the edge of fireplace opening.

Falmouth Rotary Control Damper

The Falmouth has a tilting lid—rotating on its lower edge, rather than on centrally located pivots, thus offering less exposure to the fire.

This lid is operated by a nicely finished revolving handle of cast brass extending through face brick, or tiling over fireplace opening.

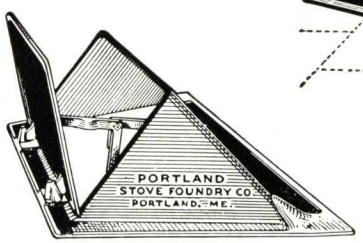


Falmouth Rotary Control Type

Atlantic Poker Control Damper

The Atlantic Throat Damper is of rugged, strongly reinforced cast iron construction, wide smoke openings.

A larger and heavier throat known as the First Pattern can be supplied on short notice. The lengths are the same. Depth 16¼ in.; height 7½ in. all sizes.

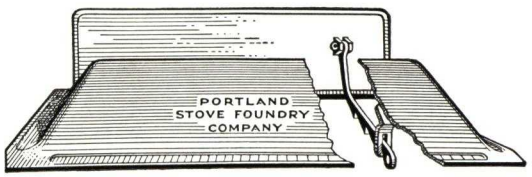


Atlantic Poker Control Type

Falmouth Poker Control Damper

The Falmouth Throat Damper is of the same rugged, reinforced construction as the Atlantic, but slightly modified in size.

The lid is operated very simply by a ratchet lever permitting four different lid openings. The flange of the frame furnishes ample support for the arch brick over fireplace openings, as in all Atlantic Dampers. If desired, the damper may be set higher in the chimney and an extra long ratchet supplied.



Falmouth Poker Control Type

Dealers' Stocks and Deliveries

Regular Portland Dealers' are located in the principal cities of the Eastern States as far south as Virginia. Other territories can be supplied from factory stocks.

ARCHITECTURAL DATA (Inches)

ATLANTIC ROTARY DAMPER

Size	A	B	C	D
24	19½	24	19½	17¾
30	25½	30	25½	23¾
36	31½	36	31½	29¾
42	37½	42	37½	35¾
48	43½	48	43½	41¾
54	49½	54	49½	47¾
60	55½	60	55½	53¾
72	67½	72	67½	65¾

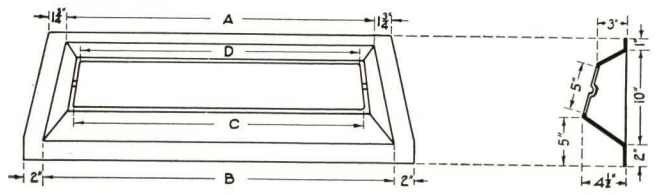
ATLANTIC THROAT DAMPER

Size	A	B	C	D	E	F	G
24	15	24	6½	7	8	7¾	12
30	21	30	6½	7	8	7¾	12
36	27	36	6½	7	8	7¾	12
42	33	42	6½	7	8	7¾	12
48	39	48	6½	7	8	7¾	12
54	45	54	6½	7	8	7¾	12
60	51	60	6½	7	8	7¾	12
72	63	72	6½	7	8	7¾	12

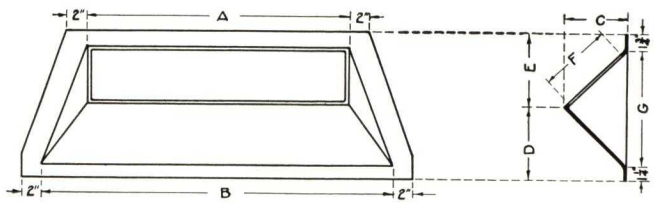
A larger and heavier Atlantic throat damper can be supplied on special order.

FALMOUTH DAMPERS

Size	A	B	C	D	E	F	G
24	19	24	5	5½	6¼	5½	9
30	25	30	5	5½	6¼	5½	9
36	31	36	5	5½	6¼	5½	9
42	37	42	5	5½	6¼	5½	9
48	42	48	5	5½	6¼	5½	9



Atlantic Rotary Dampers



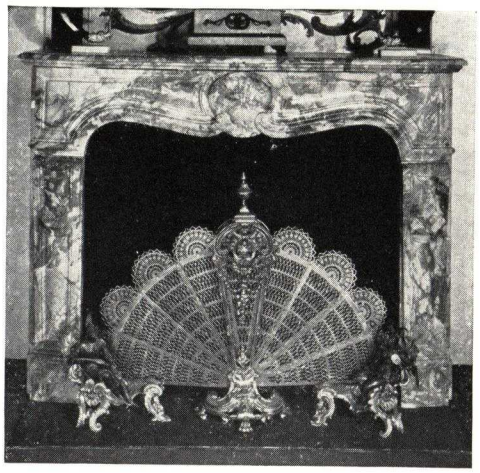
Atlantic Throat Dampers, also Falmouth Dampers

W. & J. SLOANE

MANTEL DIVISION

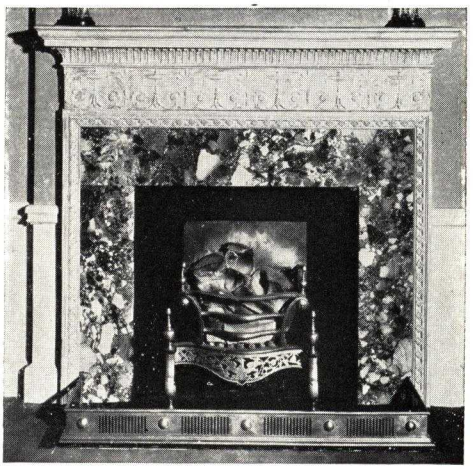
575 Fifth Avenue, NEW YORK, N. Y.

For Sloane Partitions, see File Index

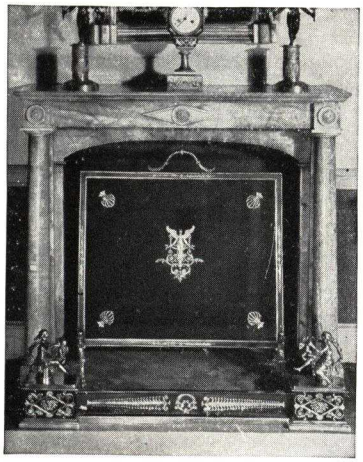


Antique Louis XV Rouge Lanquedoc
Marble Mantel

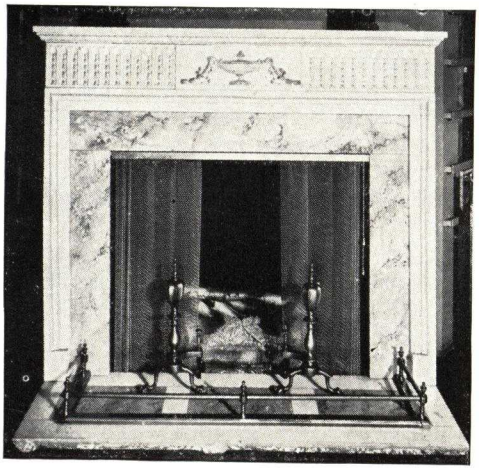
The Mantel Division of W. & J. SLOANE has a complete line for the fireplace. Mantels in marble, stone and wood . . . antiques and reproductions. An unusual collection of portable mantels, andirons, firesets, screens, fenders, grates, coal hods, electric coal and log fires . . . all of the finest craftsmanship and at moderate prices.



Antique Adam Pine
Wood Mantel



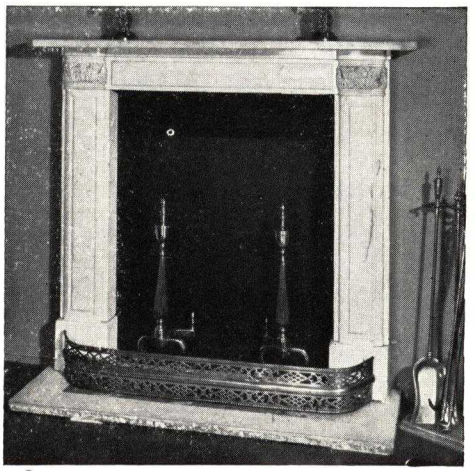
Antique Directoire
Sienna Marble Mantel



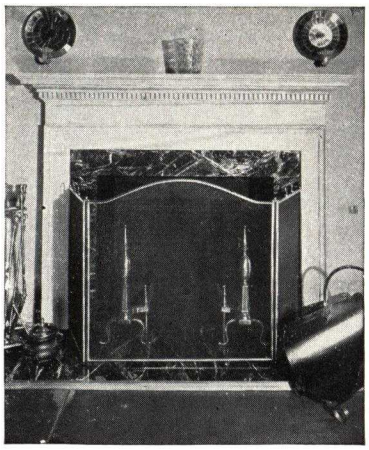
Reproduction Adam Statuary and Sienna
Marble Mantel

Co-operative Service

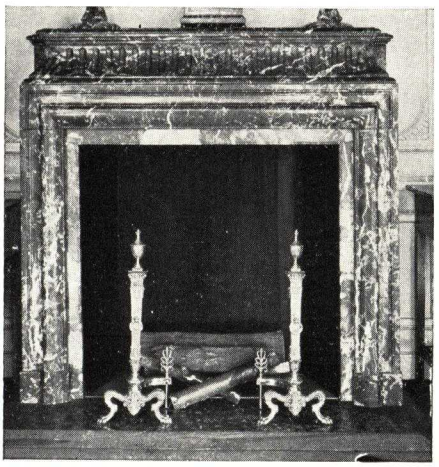
We create new designs and manufacture mantels from drawings and specifications—of any size and in any material. Descriptive literature and estimates furnished upon request.



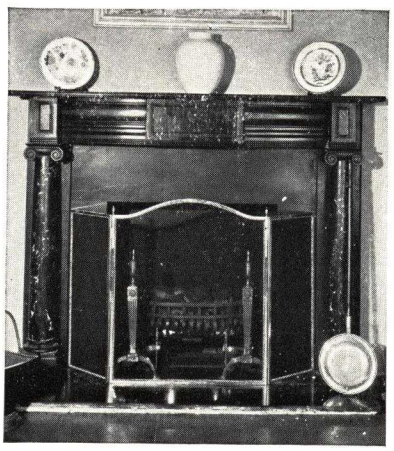
Antique English Regency White Marble Mantel



Reproduction Colonial
Pine Wood Mantel



Antique Louis XIII Rouge Rance
Marble Mantel



Antique American Colonial Black and Gold
Marble Mantel

SUPERIOR FIREPLACE CO.

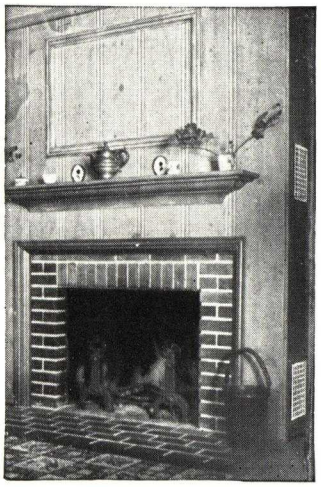
1046 South Olive Street, LOS ANGELES, CALIF.

DISTRIBUTORS IN ALL PRINCIPAL CITIES

Consult Local Telephone Directory; if not Given, Write or Wire for Nearest Distributor's Address

Left:
Air Intake and Outlet Grilles in Room Behind Fireplace

THE SUPERIOR FIREPLACE HEAT CIRCULATOR
FOR COAL, WOOD OR GAS
More Heat — Less Fuel — Smokeless Operation



Right:
Air Intake and Outlet Grilles in Side of Fireplace

Description

The Superior Heat Circulator is a double-walled metal unit, built to proper angles and dimensions, around which you build your own designed fireplace, knowing *before* you build that it will heat your home without smoking. 10,000 to 15,000 cu. ft. of air per hour is drawn from the floor into the lower sides of the heavy metal heating chamber. Here the air is heated and discharged into the home through decorative grilles located in the front or side of the fireplace, either above or below the mantelpiece. Warm air from the Heat Circulator flows to all corners of the room and into adjoining rooms, returning along the floor. In this manner an even temperature is maintained.

Advantages To Your Clients

Efficient—The Heat Circulator conserves and sends into the room a great amount of heat usually lost up the chimney in ordinary fireplaces. It draws cold air from floor level into lower part of the heating chamber where it is heated and returned to room—creating a circulation of warm air and comfortably heating *all* room corners.

Smokeless Operation — A smoky fireplace is usually the result of faulty construction in the throat and firebox. The Superior Heat Circulator includes a properly designed firebox, throat form and a correctly located damper, which forms a natural down draught shelf. *A Superior Fireplace is guaranteed not to smoke.*

Economy—It costs less to operate a Superior Fireplace than a basement furnace. In many localities it provides sufficient year-round heat. In colder climates it is a valuable auxiliary to the central heating plant, particularly in Spring and Fall when it often makes it unnecessary to operate the basement furnace.

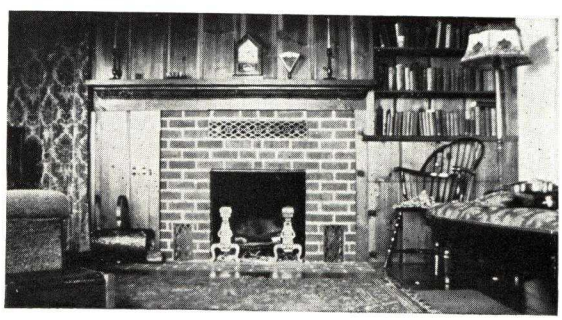
Heats Rooms at the Back or Sides — Where the fireplace is located on an inner partition wall, heat outlet and cold air intake grilles may be placed in the room at the back or sides of the fireplace, comfortably heating four or five rooms. The warm air may also be piped to rooms above.

Appearance — The unit does not alter the appearance or detract from the beauty of design, nor does it interfere with the view of the open fire. The latticed grilles through which the warm air passes, may be placed in the front or at the sides, either above or below the mantel and finished to harmonize with surrounding decorations.

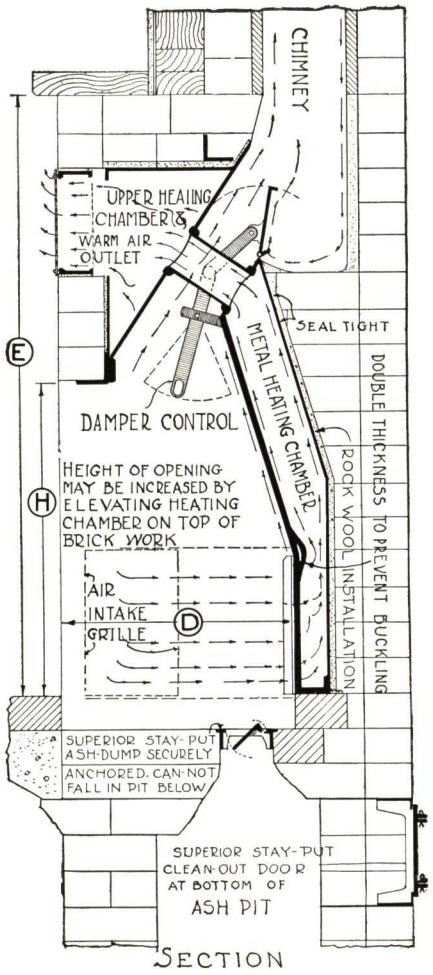
Low Cost—The Superior Fireplace Heat Circulator is comparatively low in cost. It permits a considerable saving in installation labor and material. It requires no brick firebox lining and it improves fireplace performance with a minimum expense for fuel.

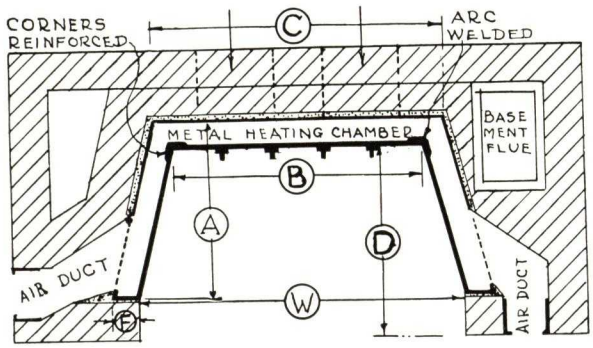
Construction

The Superior Heat Circulator is rigidly constructed and will last a lifetime. Heavy specially treated, rust-resisting plate iron is used for the inner lining of the firebox. All seams are electric arc welded, with reinforced corners. Double-reinforced thickness the full width of the back, strengthens the metal where the bend occurs, and equalizes the expansion. The lower portion of the back wall is also reinforced with a series of vertical T-shaped angle irons, providing an air space between the fire and the back wall. This prevents excessive heat and protects metal from warping. The large volume of air which is drawn through the heating chamber and evenly distributed over the back and side walls of the heating chamber prevents the metal from getting red hot and scaling. This insures long life to the unit.



Typical Fireplace Construction with the Superior Fireplace Heat Circulator





Use either side or front intake, preferably the side

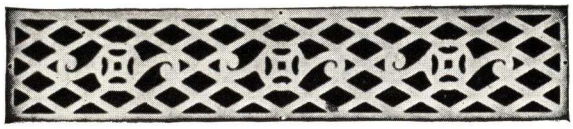
SUPERIOR HEAT CIRCULATOR MODEL—NUMBERS AND KEY TO DIMENSION IN INCHES

No.	A	B	C	D	E	F	H	W	Flue Size
24	16½	17	22	18	46	3½	24	24	9x9
29	19½	21	26	21	51	3¼	27	29	9x13
34	19½	26	31	21	51	3¼	27	34	9x17
34D	23½	24½	29	25	54	3¼	27	34	9x17
40	22½	31	36	24½	54	3¼	30	40	13x13
48	25¼	38	43	27½	60	4½	33	48	13x17
59	30¼	48	55	31½	64	4½	39	59	17x17

Other sizes made to specifications. Prices upon request.

Note:—*Each unit is provided with a rear cold air inlet which can, if desired, be used for drawing cold air from halls, rooms in back of fireplace, if located on an inner partition wall, or may be used for outside air intake if outlet grilles used are equipped with shutters which can be supplied for any design grille. Additional grille designs and installation information mailed upon request.*

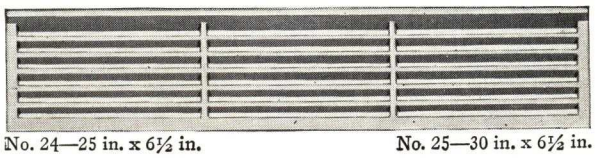
Cast Aluminum Grilles



No. 1 — 6 x 12 in.
No. 2 — 8 x 12 in.
No. 2A—12 x 16 in.
No. 2B—48 x 8 in.

No. 3 —30 x 6 in.
No. 3A—25 x 6 in.
No. 3B—36 x 8 in.

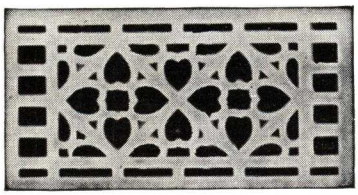
No. 23—28½ in. x 8 in.



No. 24—25 in. x 6½ in.

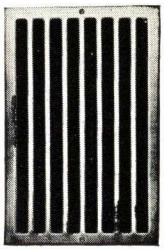
No. 25—30 in. x 6½ in.

No. 17—
6 in. x 14 in.

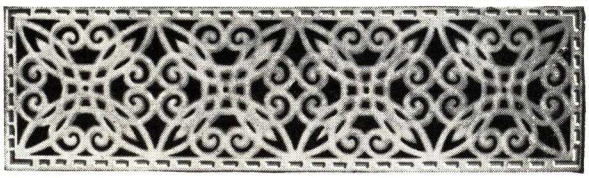


No. 15—15 x 8 in.

No. 16—34 x 8 in.



No.	Inches
21	— 8 x 8¼
22	— 8 x12
22A	— 8¼ x16¼
22B	—36 x 8
22C	—48 x 8
22D	—12 x16



No. 18 —8 x 8 in.
No. 18A—8 x 16 in.

No. 20—28½ x 8 in.
No. 19— 8 x 14¾ in.

Model Numbers, Size and Number of Grilles Required

No. 24—Heat Circulator requires for front or side air intakes from living room, two No. 1, or two No. 21. For front air outlet grilles, one No. 3A or one No. 24. Where side outlets are substituted for front outlets, use two No. 1 or two No. 21.

No. 29—Heat Circulator requires for front or side air intakes from living room, two No. 1's or two No. 17 or two No. 21. For front air outlet, one No. 3A or one No. 23 or one No. 24. Where side outlets are substituted for front outlets, use two No. 1 or two No. 17 or two No. 21.

No. 34—Heat Circulator requires for front or side air intakes from living room, two No. 2 or two No. 17 or two No. 22. For front outlet, use one No. 3 or one No. 23 or one No. 25. Where side outlets are substituted for front outlets, use two No. 2 or two No. 17 or two No. 22.

No. 40—Heat Circulator requires for front or side air intakes from living room, two No. 15 or two No. 17 or two No. 22. For front outlet, one No. 16 or one No. 23 or one No. 25. Where side outlets are substituted for front outlets, use two No. 15 or two No. 17 or two No. 22.

No. 48—Heat Circulator requires for front or side air intakes from living room, two No. 15 or two No. 2A or two No. 22A. For front air outlet, one No. 16 or one No. 3B or one No. 22B. Where side outlets are substituted, use two No. 15 or two No. 2A

No. 59—Heat Circulator requires for front or side air intakes from living room, two No. 2A or two No. 22D. Front air outlet, one No. 2B or one No. 22C. No substitute for front air outlets on this model.

NATIONAL COAL ASSOCIATION

804 Southern Building
WASHINGTON, D. C.

307 No. Michigan Avenue
CHICAGO, ILL.

PRINCIPLES OF BASEMENT PLANNING FOR MODERN COAL HEATING

Coal As a Modern Fuel

Bituminous coal as prepared for the market is a truly modern fuel. It is clean to handle and clean in burning. It is economical and safe to use and provides steady, uniform heat whether fired by hand or by a stoker. Its values as a home fuel warrant its consideration for any type of home from the modest cottage to the mansion. Hand-fired bituminous coal and coke provide the minimum cost fuels plus minimum cost heating equipment. Bituminous coal may be burned in an automatic stoker at one-half to one-third the cost of piped fuels.

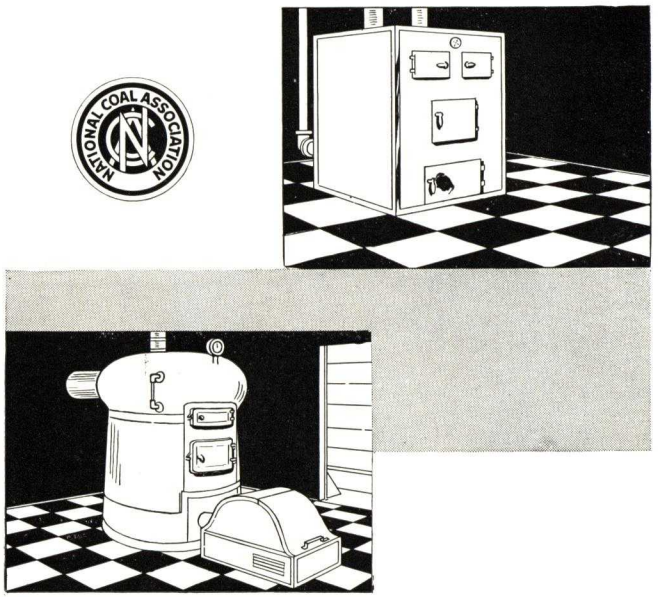
Modern Trends in Home Heating

There are four major factors in home heating: comfort, health, convenience and economy. In the past few years, convenience has probably been the most influential factor governing the choice of heating equipment and fuel used. Today, the rising costs of some "convenient" fuels and the perfecting of automatic burning equipment for coal are turning people's attention to economy and a greater degree of even, healthful heat. Here bituminous coal is supreme. It gives a degree of even, healthful heat from its sustained fire that no "pop-on, pop-off" fuel has ever given or ever can give. Furthermore, the installation of coal burning equipment gives the homeowner absolute protection against a shortage of supply with its consequent great rise in price. That this is vital is evidenced by the numerous inquiries received from homeowners concerning the possibility of changing over to modern bituminous coal.

Planning for Modern Coal Heating

The fundamental principle in planning for modern bituminous coal or coke heating is to keep driveway, storage and furnace or boiler as close together as possible. This is facilitated by the modern trend of making the garage an integral part of the home. By combining garage layout with coal storage, it is possible to save much space for other utilitarian uses or for the basement recreational room so much in demand today.

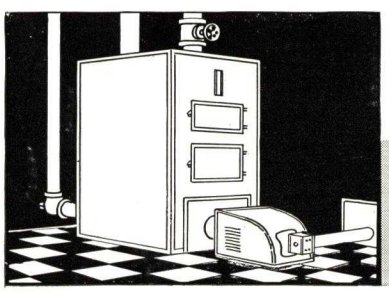
On following pages are shown six basic designs for basements which make efficient use of modern coal equipment. These are the first of a series being prepared by us with the hope that they will prove to be short-cuts for you in designing basements. Complete blueprints of each of these layouts are available and will be sent you, without obligation, if you will write to either of our offices for them.

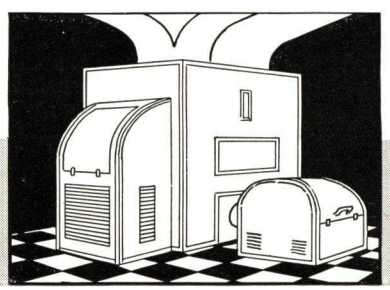


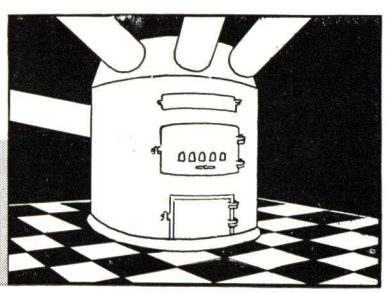
Modern Coal Burning Equipment

Great strides have been made in late years in designing more efficient, convenient and handsome furnaces and boilers for hand-fired bituminous coal and coke. Practically all of these lend themselves to automatic stoking. Also, there are available combination boiler-stoker and furnace-stoker units. Either hopper or bin-feed stokers are installed in these furnaces and boilers.

Modern enclosed coal bins can be constructed of concrete, plywood, lumber and tile as best suits the interior of the basement. The outside of these bins can easily be covered to conform to any decorative scheme. Details of such construction are included in the set of Six Typical Plans for Modern Basements, A. I. A. File 30-G, which are available to any architect or builder who asks for them. Each of these plans is based on the fundamental principles of basement planning for modern coal heating—keep driveway, coal storage and heating unit as close together as possible—provide for them when the design for a house is begun which means that the plans are constructed as logically as the house, from the basement up.

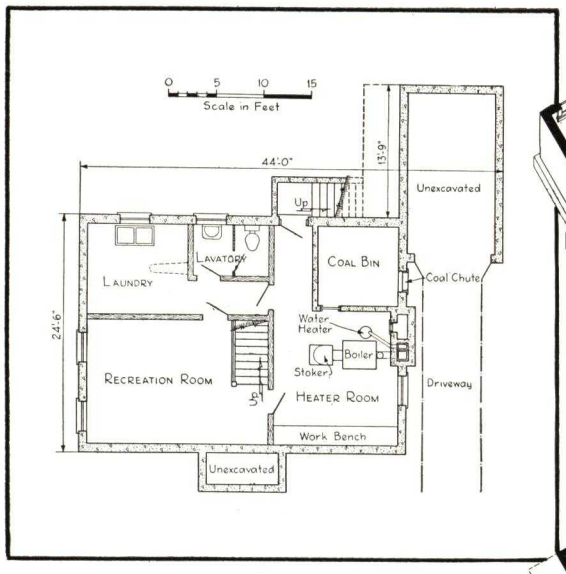


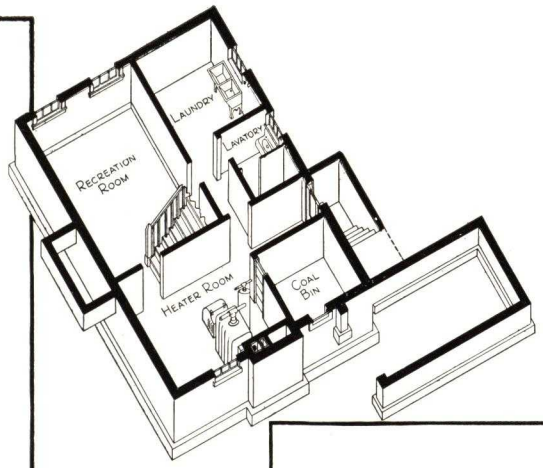


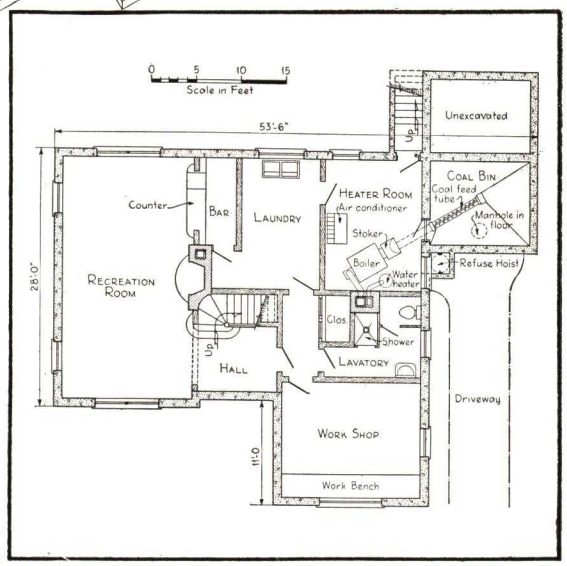


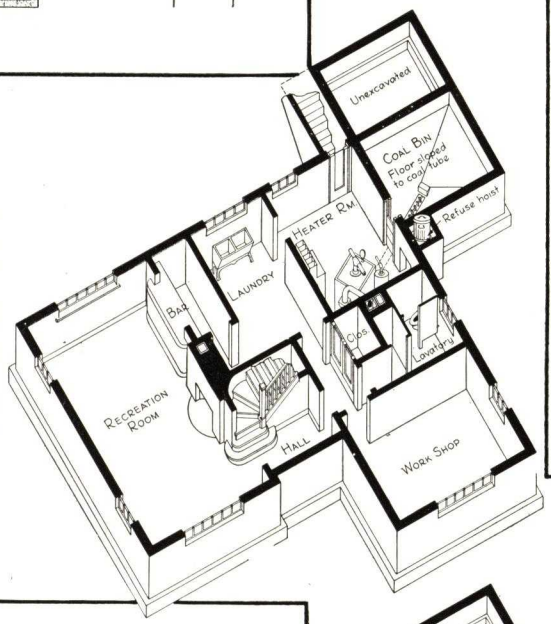
BASEMENT PLANS FOR MODERN BITUMINOUS COAL HEATING

The fundamental principle of designing for modern bituminous coal and coke heating is to keep driveway, coal storage and heating unit as close together as possible. How this can be done is illustrated in the reproductions of the plans shown on this and the following two pages.

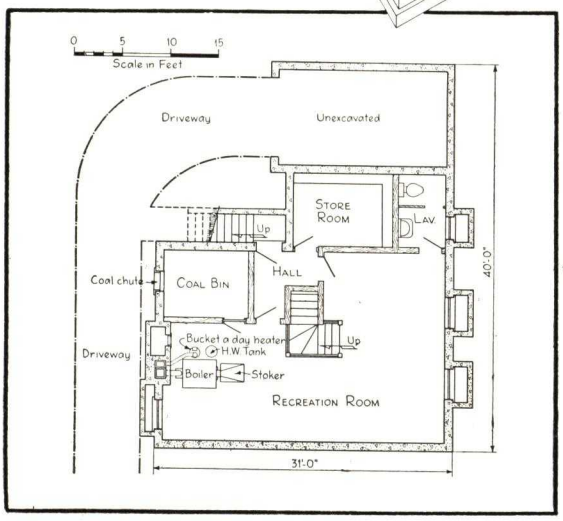


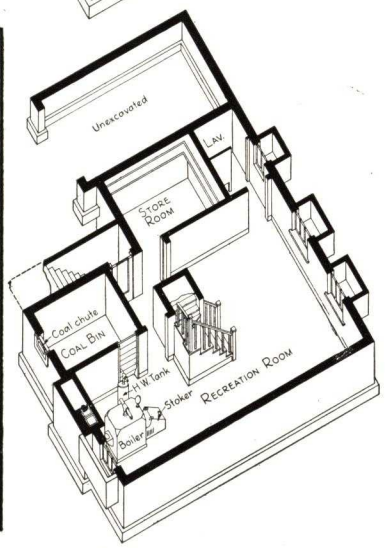






Complete architectural and isometric drawings are included in our new portfolio, "Six Typical Basement Designs for Modern Coal Heating," A.I.A. File 30-G, sent you without obligation at your request.





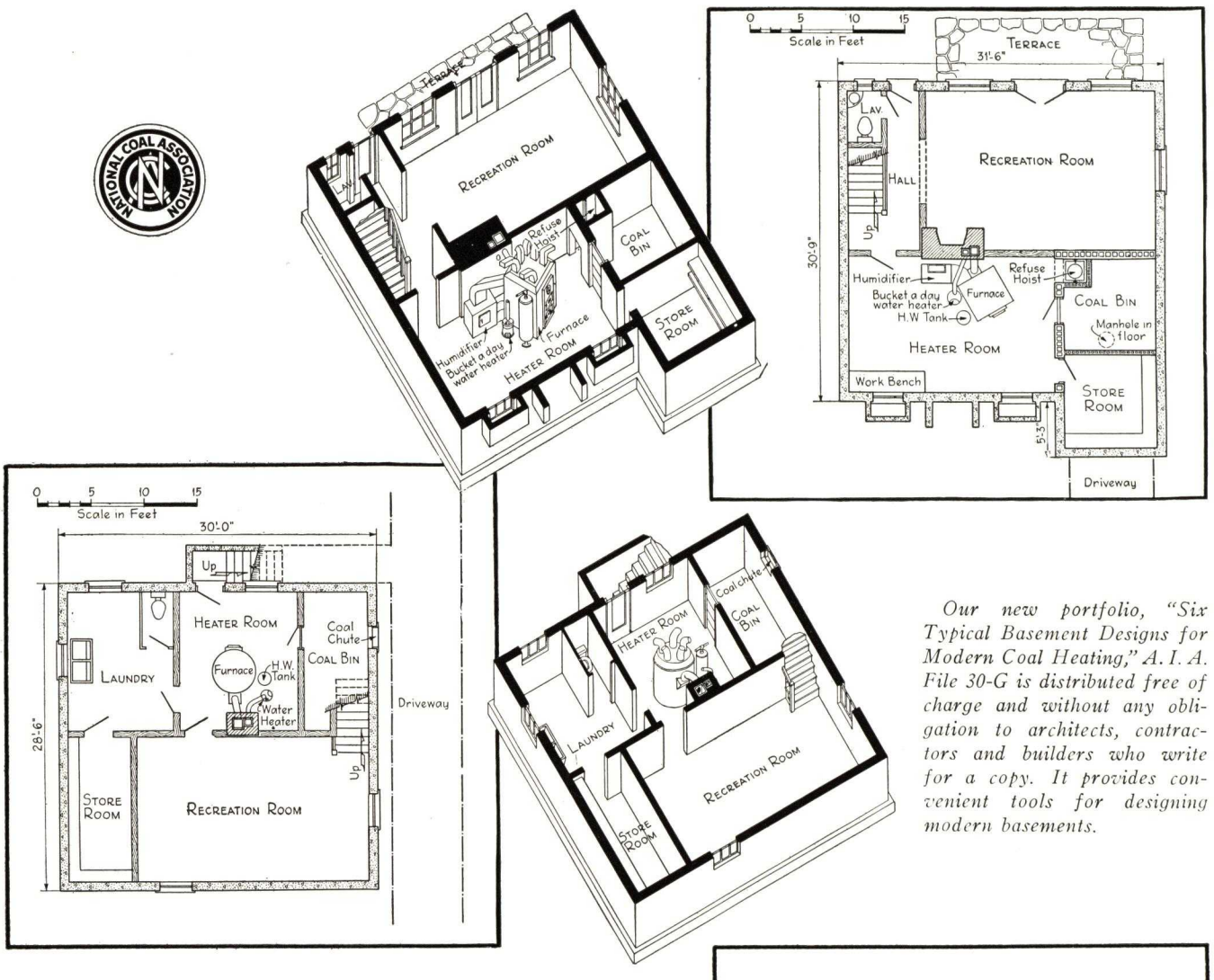
Modern bituminous coal equipment more than pays for itself in heating savings within a few years, thus making a larger part of builders' funds available for other home features. Users of bituminous coal and coke are protected from shortage of supply and rapidly rising prices by the vast deposits of bituminous coal found throughout the country. Convenience in use can be suited to the individual purse because modern, efficient units run from hand-firing to fully automatic firing.

Our portfolio, "Six Typical Basement Designs for Modern Coal Heating," makes it easier for you to plan the use of money-saving, comfort-enhancing bituminous coal by your clients.

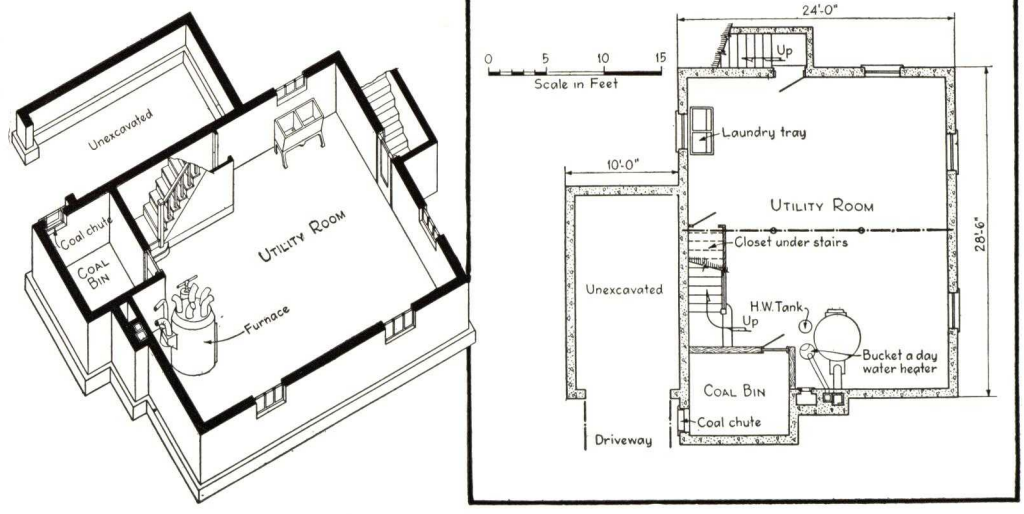
NATIONAL COAL ASSOCIATION

BASEMENT PLANS FOR MODERN BITUMINOUS COAL HEATING

Proper planning for bituminous coal and coke heating not only provides abundant basement space for other utility uses or for recreational purposes but gives the homeowner warm floors, healthful, even temperatures at low cost and with convenience in operation of the heating plant. The phenomenal growth of the stoker industry in the last few years is illustrative of the public's reaction to proved coal heat produced in the modern manner.



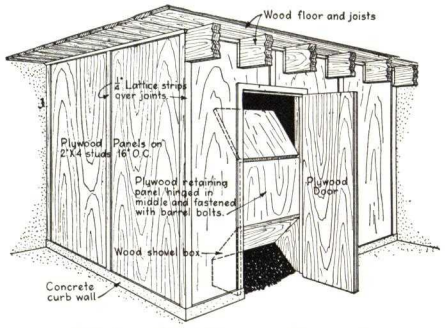
Our new portfolio, "Six Typical Basement Designs for Modern Coal Heating," A. I. A. File 30-G is distributed free of charge and without any obligation to architects, contractors and builders who write for a copy. It provides convenient tools for designing modern basements.



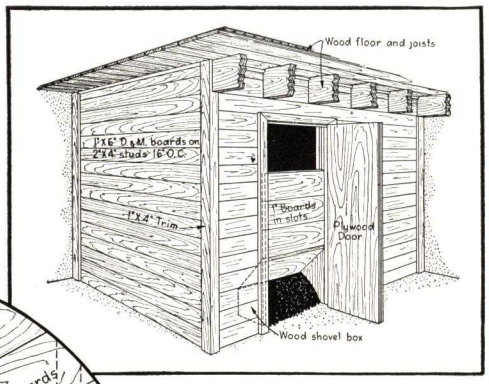
"Temperamental Temperatures" in homes have been endured in the past because they seemed a necessary evil with convenience in heating. Today, even, healthful temperatures are possible with both convenience and economy by designing and installing modern equipment for bituminous coal. The basement designs on these pages show how easily modern bituminous coal-burning equipment is incorporated into modern basement usage.

COAL STORAGE DESIGNS FOR MODERN BITUMINOUS COAL HEATING

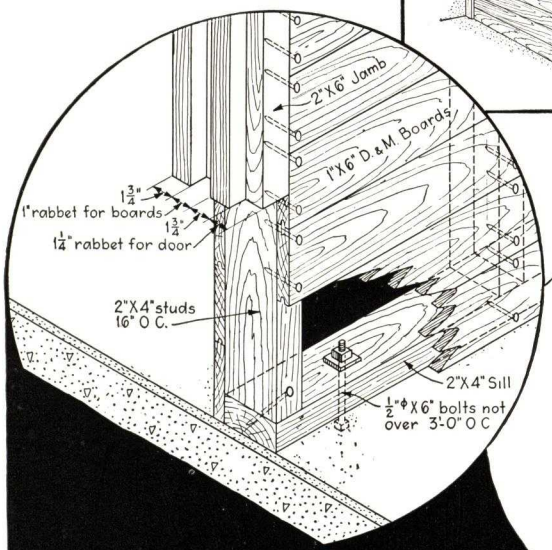
Here are illustrated a number of typically modern designs for bituminous coal storage with details of construction. These are taken from our portfolio, "Six Typical Basement Designs for Modern Coal Heating," A.I.A. File 30-G. We shall be glad to send you one of these portfolios without any obligation on your part if you will write for it to either of our offices listed on page 1.

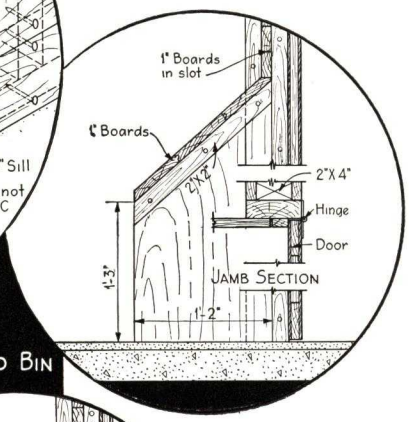


Modern Coal Storage, Plywood

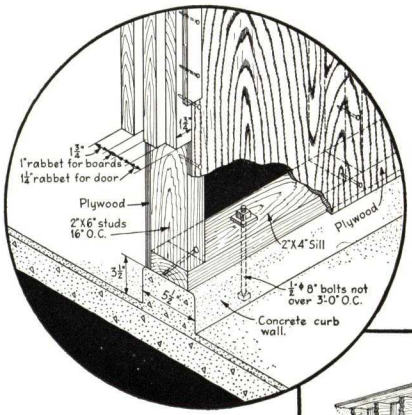


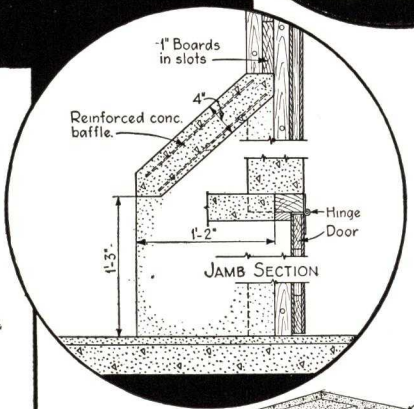
Modern Coal Storage, Wood

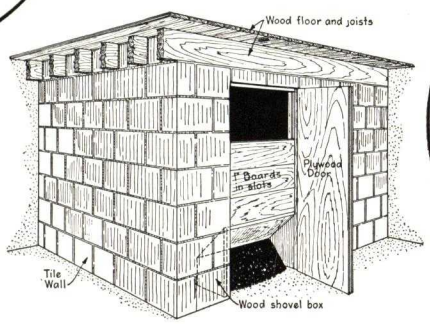




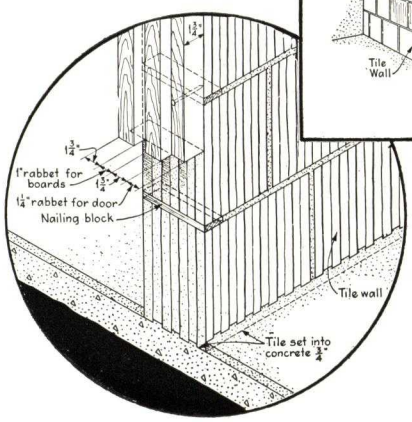
JAMB DETAIL FOR ENCLOSED MODERN WOOD BIN



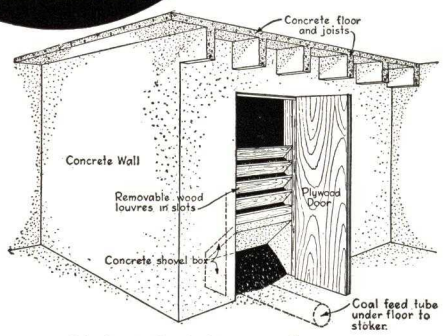




Modern Coal Storage, Hollow Tile



Our complete portfolio of typical basement designs and construction details will be sent you, free of obligation, when your request is received at either of our offices. It has been prepared for your convenience in designing homes for modern bituminous coal and coke heating—the economical way to heat a home conveniently and healthfully.



Modern Coal Storage, Concrete

MEMORANDA

PLUMBING AND BATH-ROOM EQUIPMENT
- SECTION - 27

Section Number 1/5 Catalog Number

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ESTABLISHED 1854

COHOES ROLLING MILL COMPANY

INCORPORATED 1901

COHOES, N. Y.

GENUINE WROUGHT IRON PIPE, COUPLINGS AND NIPPLES

Genuine Wrought Iron

Genuine Wrought Iron, highly resistant to both submerged and atmospheric corrosion, is used exclusively in producing Cohoes Genuine Wrought Iron Pipe. The iron that has endured throughout the centuries (designated Genuine Wrought Iron) is rolled by experts in a modern, well equipped mill into Cohoes Pipe.

Guarantee

Cohoes Pipe is unqualifiedly guaranteed to be *Genuine* Wrought Iron in every sense of the word. To conform with the most exacting requirements outlined by all Societies or Laboratories for testing materials.

Uses

The use of Cohoes Pipe is recommended for all supply or waste line piping, for long life, freedom from premature corrosion failure, and resistant to fatigue failure caused by vibration or shock, are essential. Cohoes Genuine Wrought Iron Pipe is especially recommended for electrical conduit installations which are subject to extreme corrosive action.

Installation Advantages

Of outstanding importance in a Cohoes Pipe installation is the savings on labor. The softness of Genuine Wrought Iron which makes it the exclusive pipe for resisting shock or vibration—is the quality that saves labor and tool costs in cutting and threading, and in leakproof joints. Savings that deserve sincere consideration where comparative costs are studied.

***STANDARD FULL WEIGHT GENUINE WROUGHT IRON PIPE**

Size, in.	List price, per ft.	Diameters, in.		Thickness, in.	Weight, per ft., lb.	Threads per in.
		External	Internal			
⅛	$ .05½	.405	.269	.068	.245	27
¼	.06	.540	.364	.088	.425	18
⅜	.06	.675	.493	.091	.568	18
½	.08½	.840	.622	.109	.852	14
¾	.11½	1.050	.824	.113	1.134	14
1	.17	1.315	1.049	.133	1.684	11½
1¼	.23	1.660	1.380	.140	2.281	11½
1½	.27½	1.900	1.610	.145	2.731	11½
2	.37	2.375	2.067	.154	3.678	11½
2½	.58½	2.875	2.469	.203	5.819	8
3	.76½	3.500	3.068	.216	7.616	8
3½	.92	4.000	3.548	.226	9.202	8
4	1.09	4.500	4.026	.237	10.889	8
5	1.48	5.563	5.047	.258	14.810	8
6	1.92	6.625	6.065	.280	19.185	8
8	2.88	8.625	7.981	.322	28.809	8
10	4.12	10.750	10.020	.365	41.132	8
12	5.07	12.750	12.000	.375	50.706	8
13	5.60	14.000	13.250	.375	55.824	8
14	6.10	15.000	14.250	.375	60.375	8
15	6.50	16.000	15.250	.375	64.500	8

*Any size not listed will be considered "Special."

Black Pipe or Galvanized

Cohoes Pipe is offered in two finishes: Natural or Galvanized, in all sizes and weights. In Natural finish it is called black pipe and is specified for general utility. But for plumbing lines, in or around salt water, and under severe corrosive conditions, the Galvanized finish is recommended. Genuine wrought iron, when pickled, exhibits a deeply etched surface that permits a heavy and closely bonded galvanized coating. This characteristic belonging only to wrought iron explains why Cohoes Galvanized Wrought Iron pipe gives greater life and serviceability.

Inspection and Testing

Hydraulic machines test every length of Cohoes Pipe several hundred pounds greater than ever needed in actual use. And again, it is individually inspected for defects before loading onto cars or boats.

Pipe Experts at Your Service

Over eighty years of manufacturing pipe have given us a background of knowledge and experience in the uses of pipe. In that time we have observed most theories and ideas go through the gruelling test of time. Our specialists however never cease in their study; chemists and metallurgists are investigating new requirements in laboratories and actual use. These experts are available without cost to anyone requiring information or assistance on the subject of pipe.

No Substitute for Cohoes

Cohoes Pipe has demonstrated in actual use, under every conceivable condition, that it is a pipe that will stand up where ordinary pipe would deteriorate. Its profit to owners begins at the time when other pipe would have to be replaced.

Its use for railroad cars, locomotives and as signal pipe, as well as for the conveyance of gas, water, air, ammonia, salt water and other acid bearing material, has demonstrated beyond doubt that there is no substitute for Cohoes Genuine Wrought Iron Pipe.

***EXTRA STRONG GENUINE WROUGHT IRON PIPE**

Size, in.	List price, per ft.	Diameters, in.		Thickness, in.	Weight, per ft., lb.
		External	Internal		
¼	$ .07½	.540	.302	.119	.535
⅜	.07½	.675	.423	.126	.738
½	.11	.840	.546	.147	1.087
¾	.15	1.050	.742	.154	1.473
1	.22	1.315	.957	.179	2.171
1¼	.30	1.660	1.278	.191	2.996
1½	.36½	1.900	1.500	.200	3.631
2	.50½	2.375	1.939	.218	5.022
2½	.77	2.875	2.311	.276	7.661
3	1.03	3.500	2.900	.300	10.252
3½	1.25	4.000	3.364	.318	12.505
4	1.50	4.500	3.826	.337	14.983
5	2.08	5.563	4.813	.375	20.778
6	2.86	6.625	5.761	.432	28.573
8	4.34	8.625	7.625	.500	43.388
10	5.48	10.750	9.750	.500	54.735
12	6.55	12.750	11.750	.500	65.415

***DOUBLE EXTRA STRONG GENUINE WROUGHT IRON PIPE**

Size, in.	List price, per ft.	Diameters, in.		Thickness, in.	Weight, per ft., lb.
		External	Internal		
½	$ .32	.840	.252	.294	1.714
¾	.35	1.050	.434	.308	2.440
1	.37	1.315	.599	.358	3.659
1¼	.52½	1.660	.896	.382	5.214
1½	.65	1.900	1.100	.400	6.408
2	.91	2.375	1.503	.436	9.029
2½	1.37	2.875	1.771	.552	13.695
3	1.86	3.500	2.300	.600	18.583
3½	2.30	4.000	2.728	.636	22.850
4	2.76	4.500	3.152	.674	27.541
5	3.86	5.563	4.063	.750	38.552
6	5.32	6.625	4.897	.864	53.160

*Any size not listed will be considered "Special."

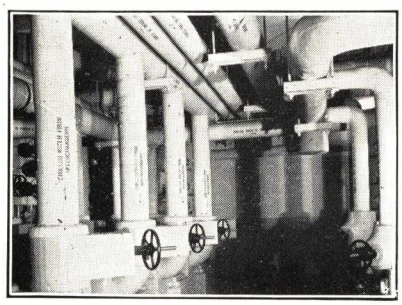
A. M. BYERS COMPANY

Genuine Wrought Iron Tubular and Flat Rolled Products
Steel Tubular Products

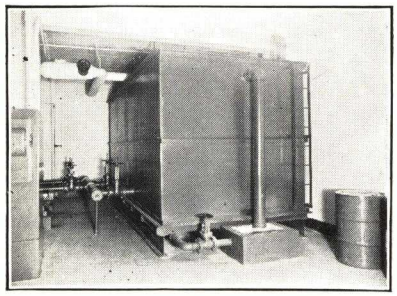
PITTSBURGH, PA.

OFFICES

BOSTON, MASS. PITTSBURGH, PA. CHICAGO, ILL. SEATTLE, WASH. HOUSTON, TEX. ST. LOUIS, MO. NEW YORK, N. Y. SAN FRANCISCO, CALIF. PHILADELPHIA, PA. WASHINGTON, D. C.



Air conditioning system piping must withstand severe corrosion. It costs but little more to install Byers Wrought Iron Pipe



Tanks made of Byers Wrought Iron Plates will last as long as the wrought iron piping to which they are connected

Byers Products

Byers Genuine Wrought Iron Pipe—Byers Genuine Wrought Iron Pipe is available either black or galvanized in the following weights and sizes: Standard Weight ¼ to 12 in., inclusive; Extra Strong ¼ to 12 in., inclusive; Double Extra Strong ½ to 8 in., inclusive.

Large Diameter Genuine Wrought Iron Pipe—May be secured in practically any outside or inside diameter size and wall thickness. It can be produced either by fusion welding or forge welding.

Genuine Wrought Iron Welding Fittings for Pipe—Welding fittings made of Byers Genuine Wrought Iron Pipe are available in a wide range of sizes. These are manufactured by Taylor Forge & Pipe Works, Chicago, Ill., and marketed under the trade name "Weldells." A request made either to Taylor Forge & Pipe Works or to A. M. Byers Company, Pittsburgh, will bring complete information regarding this product.

Genuine Wrought Iron O.D. Heat Exchanger Tubes—For use in tubular refrigeration condensers and other unfired heat exchanger equipment. Sizes furnished upon request.

Byers Steel Pipe—Byers Steel Pipe is available either black or galvanized in the following weights and sizes: Standard Weight ¼ to 12 in., inclusive; Extra Strong ¼ to 12 in., inclusive; Double Extra Strong ½ to 8 in., inclusive.

Genuine Wrought Iron Plates and Sheets—Byers Standard Sheared Plates are available in widths up to 84 in. and in thicknesses $\frac{3}{16}$ to 1 in., inclusive. Extra Long Sheared Plates are produced in widths up to 80 in. and in thicknesses $\frac{7}{16}$ to 1 in., inclusive. Universal Mill Plates and Special Forming Plates are also readily available. Special Forming Plates are intended for applications, such as flanged and dished tank heads, where severe fabrication requirements must be met.

Byers Genuine Wrought Iron Sheets are available in a complete range of sizes, 28-gauge and heavier, either flat or corrugated, hot rolled, blue annealed or galvanized. Roofing and Siding Sheets, 16 to 28-gauge, are furnished, either black or galvanized, with 1¼, 2½, or 3-in. corrugations.

Tables of sizes for both plates and sheets are given in the publication "Byers Genuine Wrought Iron Plates," sent upon request.

Genuine Wrought Iron Tank Heads—A stock of Standard Flanged and Dished Tank Heads in standard sizes is maintained at our mill for quick delivery. A list of the sizes stocked, with complete dimensional data, will be sent upon request.

Genuine Wrought Iron Bars, Angles and Channels—Byers Genuine Wrought Iron Bars, including rounds, squares, universal mill products, light and heavy bands, hexagons, bevel edge iron, half rounds, half ovals, and ovals are available in a wide range of sizes.

The sizes of Byers Genuine Wrought Iron Equal Leg Angles range from $\frac{5}{8}$x$\frac{5}{8}$x$\frac{1}{8}$ in. to 6x6x$\frac{7}{8}$ in. Unequal leg angles can be furnished in sizes ranging from 1$\frac{3}{8}$x1x$\frac{1}{8}$ in. to 6x4x$\frac{7}{8}$ in. Channel sizes that can be furnished include $\frac{3}{4}$x$\frac{3}{8}$x$\frac{1}{8}$ in. up to 10 in.—35 lbs.

A booklet giving sizes, weights and extras for Byers Genuine Wrought Iron Bars, Angles and Channels will be sent upon request.

Genuine Wrought Iron Billets—Byers Genuine Wrought Iron Billets are available in a complete range of sizes in rectangular, square or round sections.

Definition and Analysis of Genuine Wrought Iron

Wrought iron is a two-component metal consisting of high purity iron and iron silicate—an inert, non-rusting, glasslike slag. These two materials are in physical combination, as contrasted to the chemical or alloy bond that exists between the constituents of other metals.

In finished wrought iron the iron silicate or slag content amounts to about 3% by weight, and is distributed throughout the iron base metal in the form of threads or fibres which extend in the direction of rolling. The slag fibres are so thoroughly distributed throughout the metal that there are approximately 250,000 to each cross-sectional square inch. These fibres embedded in the metal give wrought iron a tough fibrous structure similar to that of hickory wood. This similarity can be seen easily by comparing a piece of each material that has been nicked and fractured. Wrought iron differs from all other metals since none of them contain siliceous slag.

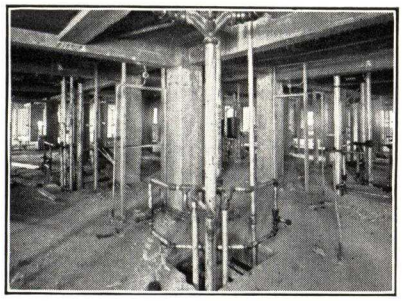
A typical analysis of Byers Genuine Wrought Iron showing distribution of the metalloids in the two constituents is given as follows:

	Combined analysis	Separate analysis showing Distribution of Constituents	
		Iron base metal	Slag
Carbon	.02	.02	..
Manganese	.03	.01	.02
Phosphorus	.12	.10	.02
Sulphur	.02	.02	..
Silicon	.15	.01	.14
Slag	3.00	..	..
	Total Metalloid ..	.16	.18

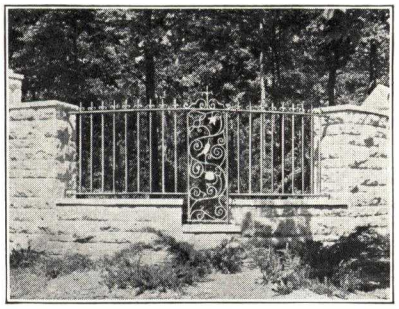
Tensile properties of wrought iron vary with the different products. However, to illustrate typical properties, following are minimum requirements of A.S.T.M. Specifications, Designation A-42, for ½-in. standard wrought iron plate:

Tensile strength, lb. per sq. in.	48,000
Yield point, lb. per sq. in.	27,000
Elongation in 8 in., per cent	14

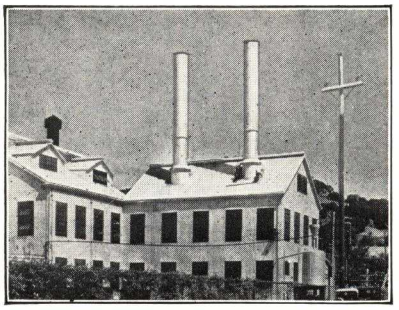
Tensile strength and yield point values can be increased materially for applications where greater strength is necessary.



Byers Wrought Iron Pipe in buildings more than pays its way through long life and low maintenance charges



Fine buildings deserve fine fences, balconies, grilles, and hardware. This fence is made of Byers Wrought Iron Bars



Byers Wrought Iron is used generally for smoke stacks and breechings, because it resists corrosion caused by flue gases

PRINCIPAL CHARACTERISTICS OF GENUINE WROUGHT IRON

Resistance to Corrosion—Durability of wrought iron is attributed in part to purity of the iron component and freedom from segregated impurities, but of far greater importance are the siliceous slag fibres embedded in the metal. The slag fibres are present in such great numbers that they serve in one capacity as an effective mechanical barrier against corrosion and, under most conditions, force it to spread over the surface rather than pit or penetrate into body of the metal. They also have a definite influence upon the chemical composition, density and adherence to the metal surface of any corrosion products that might be formed. As a result, the film or layer of corrosion products on the surface, although of microscopic thickness in many cases, affords a high degree of protection to the underlying metal in much the same way that a scab protects a wound. This, of course, is highly desirable because it tends to make corrosion uniform rather than permit it to localize and thereby cause premature failure.

Resistance to Vibration and Shock Fatigue—Wrought iron is used extensively by railroads and the marine industry because of its inherent ability to withstand conditions of shock or constant vibration that frequently cause fatigue failure in other metals. The slag fibres, which confer on the metal a tough, fibrous structure somewhat analagous to that of a stranded wire cable, are responsible for this desirable property. They serve to minimize stress concentration and deflect the path of the slip planes which develop in a metal under the influence of conditions that ordinarily result in fatigue failure.

Adherence and Weight of Protective Coatings—Under many corrosive conditions the useful life of metals can be increased somewhat by the application of a protective coating, such as paint or galvanizing. The value of the coating depends largely upon its adherence to the metal surface and its weight or thickness. However, the durability of the installation will be influenced primarily by the corrosion resistance of the metal itself because, after the coating is destroyed, the relatively thicker metal must withstand the brunt of the corrosive attack.

Experience proves that either paint or galvanizing will adhere better and last longer on wrought iron than on other ductile metals. The natural surface of wrought iron is microscopically rougher than that of other metals and provides a better "tooth" or anchorage for paints. In galvanizing, the natural roughness of a wrought iron surface is accentuated by the acid pickling operation used to clean the metal before it is dipped into molten zinc. The slag fibres are responsible for this increased roughness. As a result, wrought iron will take on a natural zinc coating which is 25% to 40% heavier than that on other metals and this makes the coating itself longer lived.

Weldability—Wrought iron has excellent welding characteristics and any of the commonly used welding processes, such as oxy-acetylene, electric fusion, electric resistance or forge welding, may be employed when welding the material.

Bendability of Tubular Products—The use of bends in pipe fabrication ordinarily results in saving labor, time, and material; reduces resistance to flow; and makes fewer couplings and fittings necessary. All Byers Genuine Wrought Iron Pipe possesses exceptional "bendability," due to uniform slag distribution coupled with special care in finishing to avoid cold straining of the metal. This is an exclusive Byers feature—not available in any other wrought iron pipe.

Identifying Markings

Pipe—(1) All Byers Genuine Wrought Iron Pipe, both black and galvanized, has the name BYERS IRON in raised letters on the metal surface every few feet for permanent identification. Also, for quick identification on the job, a RED SPIRAL STRIPE is painted on each length.

(2) All Byers Steel Pipe has the name BYERS STEEL in raised letters on the metal surface every few feet for permanent identification. Byers Steel Pipe does not have the spiral stripe marking.

Couplings—All Byers Genuine Wrought Iron Couplings are permanently marked with a "B" within a keystone rolled into the metal surface.

Nipples—Byers Genuine Wrought Iron Close Nipples are marked with a RED BAND around the center. Short and long nipples are stamped with the name BYERS and the weight.

Plates and Sheets—Byers Genuine Wrought Iron Plates and Sheets are stenciled with the marked "Byers—1864—Genuine Wrought Iron," within an oval.

AVAILABLE PUBLICATIONS

Following is a list of publications covering products, applications, and specifications, any of which may be obtained by writing on your business letterhead direct to the Engineering Service Department, A. M. BYERS COMPANY, Pittsburgh, Pa.

Wrought Iron, Its Manufacture, Characteristics and Applications, by J. Aston and E. B. Story—A handbook of useful, up-to-date information on wrought iron. Will be sent free if requested on business letterhead. To all others, price $1.00 per copy.

The Bending of Wrought Iron Pipe—A service manual on the theory and practice of bending Byers Genuine Wrought Iron Pipe. Tables of hot and cold bend diameters and a section on Van Stoning are included.

The Threading of Wrought Iron Pipe—A service manual covering the theory and practice of producing good pipe threads.

The Bending of Wrought Iron Plates—Discusses principles, practices, and equipment employed in plate bending. Of interest to both the designer and the shop man.

Byers Genuine Wrought Iron Plates—Provides complete tables of sizes for both plates and sheets.

The Installation of Genuine Wrought Iron Tubes—Provides complete information on installation procedure, manufacturing standards and sizes of O. D. wrought iron tubes.

Byers Genuine Wrought Iron Billets—Gives a description of methods employed in manufacturing Byers Billets and a table of sizes.

Engineering Data on Byers Genuine Wrought Iron Oil Well Tubing and Casing—A series of comprehensive tables giving length of string, bursting and collapsing values for standard and A.P.I. oil country tubular products.

101 Uses for Wrought Iron—An illustrated review of the more prominent uses for wrought iron products in modern construction.

Wrought Iron in Sanitary Systems—A technical bulletin on corrosive conditions and applications for wrought iron products in modern sewage treatment and disposal work.

Wrought Iron for Flue Gas Conductors and Coal Handling Equipment—A special report of particular value to those interested in obtaining longer service life from their flue gas and coal handling equipment.

Wrought Iron in Refrigeration Systems—Contains a discussion of corrosive conditions encountered and suggests an economical solution to the problem of durability.

Wrought Iron in Bridge Construction—A special report on applications and designs that is of particular interest to engineers responsible for the construction and maintenance of bridge structures.

Wrought Iron in Salt Water Services—An understandable discussion of salt water corrosion and experience data on wrought iron installations subjected to its action.

Wrought Iron in Tank Construction—A technical bulletin that contains information of particular interest to those charged with specifying or maintaining tank equipment.

Specifications—Byers Genuine Wrought Iron Products and Byers Steel Pipe meet the requirements of specifications promulgated by all recognized standards organizations. Copies of the most commonly used specifications will be sent upon request.

NATIONAL TUBE COMPANY

UNITED STATES STEEL CORPORATION SUBSIDIARY

PITTSBURGH, PA.

DISTRICT SALES OFFICES

ATLANTA	DALLAS	HOUSTON	PHILADELPHIA	ST. PAUL
BOSTON	DENVER	KANSAS CITY	PITTSBURGH	SALT LAKE CITY
CHICAGO	DETROIT	NEW ORLEANS	ST. LOUIS	TULSA
		NEW YORK		

COLUMBIA STEEL COMPANY

SAN FRANCISCO, LOS ANGELES, PORTLAND, SEATTLE—Pacific Coast Distributors

EXPORT DISTRIBUTORS—United States Steel Products Company, NEW YORK, N. Y.

Products

NATIONAL WROUGHT STEEL PIPE, in butt-weld, lap-weld, electric-weld, hammer-weld and seamless, including NATIONAL Scale Free Pipe, NATIONAL Copper-Steel Pipe, NATIONAL Duroline Pipe, NATIONAL Seamless Steel Pipe.

NATIONAL TUBE COMPANY is the largest manufacturer of tubular products in the world, manufacturing a complete line of welded and seamless wrought tubular products in sizes from ⅛ to 96 in.

Literature and information on request.

NATIONAL SCALE-FREE PIPE FOR MODERN BUILDING SERVICE

Many outstanding advances in the manufacture of steel pipe have been made by NATIONAL TUBE COMPANY. One of the most important to the building industry is its production of butt-weld pipe (½ to 3-inch) free of the heavy welding scale which has in the past characterized all wrought butt-weld pipe. On this pipe there remains only the thin, tightly adhering film of blue oxide which gives a certain amount of protection to the surfaces of the metal. Scale of all kinds is noticeably absent.

National Scale Free Pipe eliminates wear and tear on valves and fittings formerly caused by loose scale.

National Scale Free Pipe affords full rated diameter of the pipe and reduced frictional resistance. The presence of welding scale in pipe amounts substantially to a reduction of its diameter and diminishes the working capacity of the pipe.

National Scale Free Pipe is particularly advantageous in steam lines, gas lines and sprinkler lines. For example, in sprinkler systems, scale, sediment or foreign substances of any kind diminish the effectiveness and operative efficiency of the sprinkler heads, sometimes clogging them entirely. National Scale Free Pipe, therefore, helps to maintain free, original delivery of water to the sprinkler heads. In exposed positions the smooth, scale free surfaces are an advantage in painting and gilding, giving maximum beauty of finish to a job that is primarily utilitarian and secondarily architectural.

National Scale Free Pipe presents a clean, interior surface, ideal for the adherence of galvanizing coating. In the past there has been more or less difficulty in securing a satisfactory galvanized interior on pipe—due primarily to welding scale which is difficult to remove by pickling. Heretofore, where welding scale was present and became loose and dropped off, it carried the galvanizing with it and left the unprotected portion of the pipe open for attack to what is commonly called pitting—the direct result of galvanic action or the concentration of deleterious influences on the few unprotected spots of the metal.

National Scale Free Pipe, Galvanized, is recommended for hot and cold water lines. Specific advantages of National Galvanizing are: full weight coating is applied without wiping off the pure zinc from the pipe surface; and special Chromate treatment to insure satisfactory appearance of new installations.

National Scale Free Pipe is Spellerized. This is a special roll-knobbling or hot-forging treatment of the heated bloom which works the surface of the metal to eliminate any irregularities and to produce a uniformly dense surface finish more resistant to corrosion. Spellerizing is an exclusive National process.

National Copper-Steel Pipe

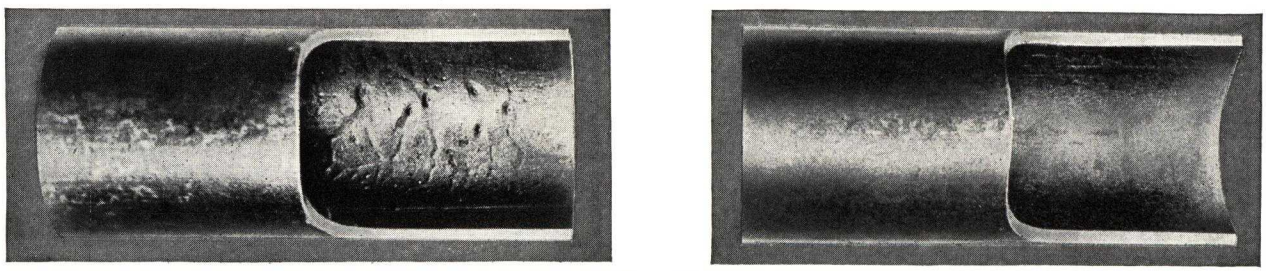
Copper-Steel Pipe is regular National Bessemer or open hearth steel pipe to which has been added from .20 to .35 per cent copper in order to materially increase the resistance of the steel to rusting. This copper is added to the molten metal at the Bessemer converter or open hearth furnace immediately after the refining operations have been completed and thus insures uniform distribution of the copper throughout the steel by dissolving in it, forming a true solid-solution alloy.

Why Copper-Steel Pipe Is Recommended for Buildings

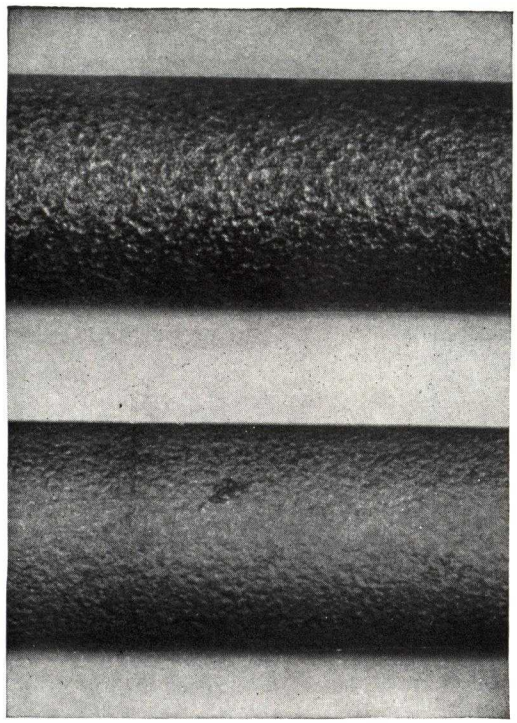
Pipe installed in buildings is not ordinarily thought of as being subjected to atmospheric corrosion. It is a fact, however, that a considerable portion of such piping is exposed to conditions which approximate atmospheric corrosion.

The so-called "drainage systems" in the larger buildings, comprising, in general, the soil, waste, vent lines and rain leaders, are exposed throughout to moisture and air of a more or less corrosive nature, which are continuously passing through the pipes. In all of these lines, an alternate wet and dry condition is continually met, due to the heat from hot-water waste, to the intermittent service, or (in the case of rain leaders) to the normal variation in weather conditions.

Copper-Steel Pipe is recommended for all of these services, as this is the particular type of corrosion against which Copper-Steel has proved most effective.



Exterior and Interior Butt-Weld Pipe Before (Left) and After (Right) Passing Through the Special Scale Removing Rolls



Atmospheric Corrosion Test of Non-Copper and Copper Bearing Pipe Conducted Over a Period of Years—Lower Section Is the Copper Bearing Pipe

Another important use of Copper-Steel in buildings for a somewhat different type of corrosion, is in the steam return lines of the heating system. The steam condensate frequently carries considerable free carbonic acid, which rapidly attacks ordinary iron or steel pipe. Copper-Steel Pipe resists to a marked degree the attack of this acidic water, and while not a cure-all for this difficulty (if condensate is exceedingly acid) under normal operating conditions it frequently adds many years to the life of the return system, with only a very slight additional initial cost of the material. Still greater protection is afforded by the additional wall thickness of extra strong copper steel—which can be used at a cost no greater and in many cases less than the cost of special materials of standard weight, i.e., ordinary wall thickness.

Important Facts About National Copper-Steel Pipe

When pipe is painted, one of the main causes of the destruction of paint films is corrosion of the underlying metal. Paint is known to adhere longer and more uniformly to copper-steel than to regular steel due to the lesser tendency of the copper-steel base to corrode under the paint film which is often more or less porous.

National Copper-Steel Pipe is recommended for all places where piping is exposed to the weather, or alternate wet and dry conditions. In buildings it is particularly suitable for soil, waste, and vent lines; rain leaders; and for steam return lines under certain conditions; outside, it is used for exposed handrails, exposed piping on locomotives and cars; for railway signal work, including signal, tickler, and semaphore poles and piping; pipe on bridges, irrigation and sprinkler lines, flagpoles, electric light and power poles, acid mine waters, marine piping, atmospheric condensers, and similar equipment.

National Copper-Steel Pipe costs far less than any other so-called special pipe, and the increased life of copper-steel lines easily earns the small extra cost by prolonging the life of a system to several times that to be expected from non-copper steel pipe.

Architects, engineers, and plumbing and heating contractors can render a worthwhile service to their clients by specifying and using National Copper-Steel Pipe for a large portion of pipe in buildings. Over twenty years of accumulated evidence, including both special tests and actual service records, indicate that National Copper-Steel Pipe successfully resists the type of corrosion involved.

Identification of National Copper-Steel Pipe

National Copper-Steel Pipe is marked as follows: Black Pipe—All sizes up to and including 1¼-in. are given a coat of green paint on the entire outside surface. Sizes 1½-in. and larger are marked with two diametrically opposed longitudinal stripes of green paint.

Galvanized Pipe—All sizes have two diametrically opposed longitudinal stripes of green paint.

NATIONAL STANDARD PIPE
Full Standard Weight—Black and Galvanized
All weights and dimensions are nominal

Size, in.	Diameters, in.		Thickness, in.	Wt. per ft., lb.		Threads per inch	Couplings, in.	
	External	Internal		Plain ends	Threads and couplings		Diameter	Lgth.
⅛	.405	.269	.068	.24	.24	27	.562	⅞
¼	.540	.364	.088	.42	.42	18	.685	1
⅜	.675	.493	.091	.56	.56	18	.848	1⅛
½	.840	.622	.109	.85	.85	14	1.024	1⅜
¾	1.050	.824	.113	1.13	1.13	14	1.281	1⅝
1	1.315	1.049	.133	1.67	1.68	11½	1.576	1⅞
1¼	1.660	1.380	.140	2.27	2.28	11½	1.950	2⅛
1½	1.900	1.610	.145	2.71	2.73	11½	2.218	2⅜
2	2.375	2.067	.154	3.65	3.67	11½	2.760	2⅝
2½	2.875	2.469	.203	5.79	5.81	8	3.276	2⅞
3	3.500	3.068	.216	7.57	7.61	8	3.948	3⅛
3½	4.000	3.548	.226	9.10	9.20	8	4.591	3⅝
4	4.500	4.026	.237	10.79	10.88	8	5.091	3⅝
5	5.563	5.047	.258	14.61	14.81	8	6.296	4⅛
6	6.625	6.065	.280	18.97	19.18	8	7.358	4⅛
8	8.625	8.071	.277	24.69	25.00	8	9.420	4⅝
8	8.625	7.981	.322	28.55	28.80	8	9.420	4⅝
10	10.750	10.192	.279	31.20	32.00	8	11.721	6⅛
10	10.750	10.136	.307	34.24	35.00	8	11.721	6⅛
10	10.750	10.020	.365	40.48	41.13	8	11.721	6⅛
12	12.750	12.090	.330	43.77	45.00	8	13.958	6⅛
12	12.750	12.000	.375	49.56	50.70	8	13.958	6⅛

The permissible variation in weight is 5% above and 5% below. Galvanized, coated or copper-steel pipe can be furnished on all the above sizes.

NATIONAL EXTRA STRONG PIPE

Size, in.	Diameters, in.		Thickness, in.	Weight per foot plain ends, lb.
	External	Internal		
⅛	.405	.215	.095	.31
¼	.540	.302	.119	.53
⅜	.675	.423	.126	.73
½	.840	.546	.147	1.08
¾	1.050	.742	.154	1.47
1	1.315	.957	.179	2.17
1¼	1.660	1.278	.191	2.99
1½	1.900	1.500	.200	3.63
2	2.375	1.939	.218	5.02
2½	2.875	2.323	.276	7.66
3	3.500	2.900	.300	10.25
3½	4.000	3.364	.318	12.50
4	4.500	3.826	.337	14.98
5	5.563	4.813	.375	20.77
6	6.625	5.761	.432	28.57
8	8.625	7.625	.500	43.38
10	10.750	9.750	.500	54.73
12	12.750	11.750	.500	65.41

The permissible variation in weight is 5% above and 5% below. Galvanized, coated or copper-steel pipe can be furnished on all the above sizes.

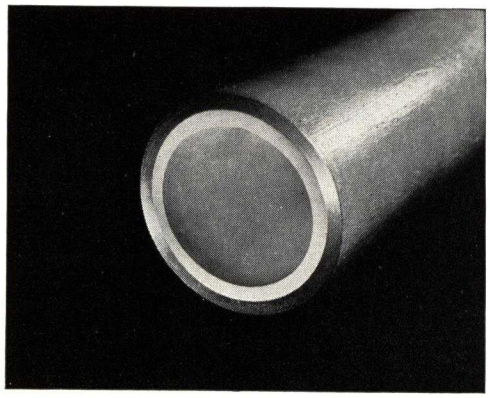
NATIONAL TUBE COMPANY

NATIONAL DUROLINE PIPE

A highly improved cement-lined pipe for hot- and cold-water supply systems in buildings.

Also, for underground water supply mains, distribution mains, and service connections; industrial water, salt and sea water, and mine drainage lines; handling special chemical solutions, etc.

The expense and inconvenience resulting from the deterioration of metal piping by internal corrosion are matters of common knowledge and experience. Everyone familiar with domestic and industrial piping problems recognizes that a definite need exists for a pipe that is more resistant to the destructive action of corrosive waters and corrosive solutions than the uncoated or galvanized wrought iron, steel, and low-alloy iron-base materials commonly used. Some non-ferrous metals and the stainless alloy steels effectively resist many types of corrosion, but economic considerations prohibit the general use of these high priced materials. The rapid development of industrial processes using large volumes of corrosive waters and solutions, and the increasing tendency to filter, clarify, and soften domestic water supplies has aggravated the pipe-corrosion problem and created a demand for a product combining the strength and other desirable features of steel pipe, with exceptional corrosion resistance and a price permitting its general use.



Duroline

National Duroline Pipe is the answer to this demand. In it are combined the well-known advantages and dependability of National steel pipe, the protection of a special lining material—Duroline—that is remarkably resistant to the action of corrosive waters and certain chemical solutions, and finally, a price that is only slightly above that paid for ordinary galvanized steel pipe.

Effectiveness Against Corrosion

Pipes lined with Portland or natural cement mixtures have been used in cold-water lines for over a hundred years. Despite the deficiencies of these lining materials, as manifested chiefly in relatively high solubility and cracking and spalling due to excessive shrinkage, they have been effective in preventing corrosion, tuberculation, rusty water, and clogged pipes. Impressed by these results, NATIONAL TUBE COMPANY conducted extensive research work on the composition of special cements—intended primarily for corrosion-resistant pipe linings. Duroline, the perfected product is a material of low-lime and high-silica content that has less than one-third the solubility of ordinary Portland cement mixtures. Special methods of curing were evolved which promote the rapid development of high strength and reduce the inherently low shrinkage of this special cement to a point where this is no longer a factor of any importance. Improved methods of lining, insuring uniform application, and a rational solution of the joint problem, were essential features in the development of this product.

The thermal characteristics of Duroline make this pipe particularly suitable for use in domestic and industrial hot-water lines. The lining is not affected by rapid temperature changes or by long exposure to temperatures up to 210° F., while its low-thermal conductivity is of decided value in providing heat insulation in these services at no additional expense.

Duroline Pipe has an unusually smooth interior surface. As a result, the flow of liquids under a given head is greater for this pipe than for unlined pipe of the same diameter. It is not necessary to use a larger size of lined pipe than would be specified if regular black or galvanized material were to be used. Piping is installed with provision for some accumulation of rust, and such allowance more than compensates for the slight decrease in area due to the lining.

Duroline Pipe has good mechanical strength due to the use of a sound cement in the form of a continuous arch, and to protection afforded by the steel pipe covering. No unusual handling precautions are necessary, and it can be cut, threaded, and sprung into place the same as ordinary pipe. It should not be bent; lined fittings are available and should be used wherever abrupt changes in the direction of a line are necessary.

Duroline Pipe is intended primarily for carrying waters or certain solutions that rust, corrode, or otherwise attack unprotected metal pipe. Waters that tend to clog pipe with rust, frequently called tuberculating waters are particularly resisted by this pipe, since insoluble compounds form in the lining surface, stopping further action. Important uses include municipal and suburban supply, distribution, and service lines; and private water-supply lines for industrial establishments, railways, farms, and similar purposes, oil field gathering and salt water lines. In the building field Duroline Pipe is ideal for both hot- and cold-water systems, and is being used with entire satisfaction in a number of office and public buildings, hospitals, schools, and residences, in localities where unlined pipe is perforated by corrosion in a few years time.

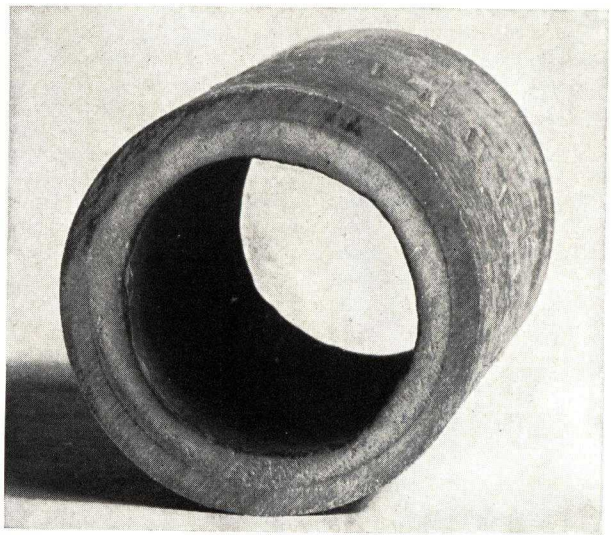
The waters used for cooling purposes in steel mills, power plants, and similar industries are frequently contaminated mine, industrial, and sewage disposal wastes, and are actively corrosive. Duroline Pipe is particularly appropriate under these conditions as well as where waters uncontaminated by iron or other metals are required, as in laundries, textile and rayon plants, sugar refineries, paper mills, etc.

Duroline Pipe is resistant to hot and cold salt and sea waters, which corrode both non-ferrous and ferrous metals, as well as to the salt water and hydrogen sulphide mixtures found in the oil industry, and to acid mine waters. Chemical solutions that have been successfully handled include hydrogen peroxide, copper sulphate, hydrogen sulphide, alum, sulphite liquor, dyes, bleaches, etc.

The Result of Years of Research

National Duroline Pipe must not be confused with ordinary cement lined pipe. Extensive research has continued over a period of years on the compostion of special cements, methods of lining, curing processes and—what is frequently neglected or evaded—convenient and reliable methods for making joints. The resulting technical and scientific developments incorporated in Duroline Pipe warrant considering it as an entirely new and outstanding product. NATIONAL TUBE COMPANY deliberately withheld publicity regarding this product until, aside from all laboratory and small-scale tests, the outstanding resistance to corrosion and the unusual physical properties of Duroline Pipe had been rigorously tested in actual commercial installations.

National engineers and chemists welcome the opportunity to show you how Duroline Pipe can solve your corrosion problems with an immediate saving in initial cost and, due to minimized maintenance and replacement expense, at the lowest ultimate cost consistent with adequate service.

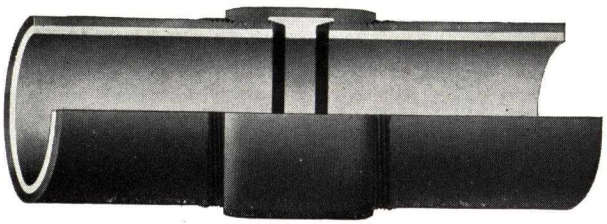


National Duroline Pipe After Three Years' Use in a Hot-Water Supply Line at the United States Veterans' Hospital, Aspinwall, Pa.
Note the smooth, clean interior surface

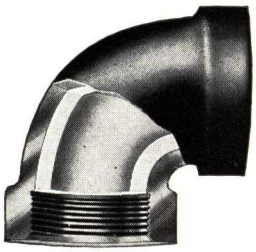
Identification of Duroline Pipe

Duroline Pipe may be easily identified during storage and installation by the distinctive colors of paint applied to the entire outside surface of the pipe before it is shipped from the mill. These colors are battleship gray on standard pipe (not galvanized) with threads and couplings, sizes ½ to 12 in.; jet black on all sizes of plain end pipe and line pipe; and aluminum paint or galvanized pipe.

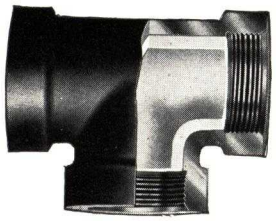
In addition to these over-all colors, Duroline Copper-Steel Pipe of all sizes has two diametrically opposed, longitudinal stripes of green paint to identify the special grade of steel.



Section of National Duroline Pipe Coupling and Joint
Note special corrosion resistant compounds on end of the pipe and on all threads

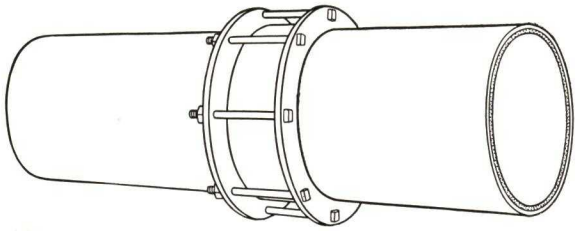


Duroline Elbow

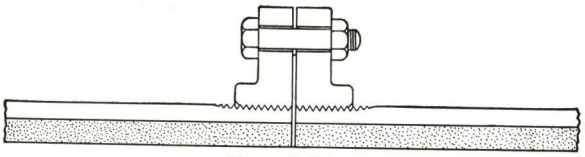


Duroline Tee

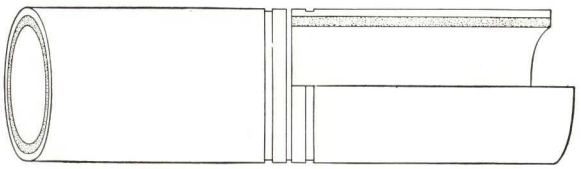
Duroline Elbows, Tees, Unions, etc., may be obtained through dealers handling National Pipe



Patent Bolted or Sleeve Type Coupling

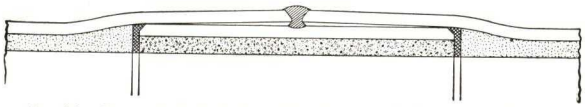


Flanged Joint



Grooved End

Expanded End for Welding—Note Joint Compound



Double Expanded End for Welding with Internal Sleeve
Additional types of joints for Duroline Pipe

WEIGHTS, DIMENSIONS, AND TEST PRESSURES OF NATIONAL DUROLINE PIPE

Standard Weight Black and Galvanized
All Weights and Dimensions Are Nominal

Size, in.	Diameters, inches			Thicknesses, in.		Weights per foot, pounds				Coupling dimensions, inches		Threads per inch	Test pressures, pounds per square inch	
	External	Internal		Steel pipe wall	Duroline lining (minimum)	Plain end		Threads and couplings		Length	External diameter		Butt-weld	Lap-weld
		Unlined steel pipe	Duroline pipe			Unlined steel pipe	Duroline pipe	Unlined steel pipe	Duroline pipe					
½	.840	.622	.484	.109	.06	.85	.97	.85	.97	1 3/8	1.024	14	700	.....
¾	1.050	.824	.686	.113	.06	1.13	1.29	1.13	1.30	1 5/8	1.281	14	700	.....
1	1.315	1.049	.896	.133	.06	1.67	1.91	1.68	1.92	1 7/8	1.576	11½	700	.....
1¼	1.660	1.380	1.175	.140	.08	2.27	2.68	2.28	2.70	2 1/8	1.950	11½	700	1000
1½	1.900	1.610	1.405	.145	.08	2.71	3.20	2.73	3.22	2 3/8	2.218	11½	700	1000
2	2.375	2.067	1.780	.154	.10	3.65	4.53	3.67	4.56	2 5/8	2.760	11½	700	1000
2½	2.875	2.469	2.182	.203	.10	5.79	6.85	5.81	6.88	2 7/8	3.276	8	800	1000
3	3.500	3.068	2.725	.216	.125	7.57	9.15	7.61	9.20	3 1/8	3.948	8	800	1000
3½	4.000	3.548	3.205	.226	.125	9.10	10.95	9.20	11.05	3 5/8	4.591	8	.....	1000
4	4.500	4.026	3.620	.237	.156	10.79	13.26	10.88	13.36	3 5/8	5.091	8	.....	1000
5	5.563	5.047	4.548	.258	.187	14.61	18.43	14.81	18.62	4 1/8	6.296	8	.....	1000
6	6.625	6.065	5.440	.280	.250	18.97	24.70	19.18	24.91	4 1/8	7.358	8	.....	1000
8	8.625	8.071	7.446	.277	.250	24.69	32.41	25.00	32.72	4 5/8	9.420	8	.....	800
8	8.625	7.981	7.356	.322	.250	28.55	36.18	28.80	36.44	4 5/8	9.420	8	.....	1000
10	10.750	10.192	9.443	.279	.312	31.20	42.91	32.00	43.71	6 1/8	11.721	8	.....	600
10	10.750	10.136	9.387	.307	.312	34.24	45.88	35.00	46.65	6 1/8	11.721	8	.....	800
10	10.750	10.020	9.271	.365	.312	40.48	51.99	41.13	52.64	6 1/8	11.721	8	.....	900
12	12.750	12.090	11.341	.330	.312	43.77	57.74	45.00	58.98	6 1/8	13.958	8	.....	600
12	12.750	12.000	11.251	.375	.312	49.56	63.43	50.70	64.58	6 1/8	13.958	8	.....	800

The I.D. of lined pipe is the nominal I.D. of unlined pipe minus twice the average thickness of lining.

Weights are theoretical, based on average thickness of lining, and are calculated on the basis of one cubic inch of steel weighing .2833 pound and one cubic inch of Duroline weighing .0845 pound.

Galvanized Duroline Pipe is furnished with the galvanizing on the outside only.

Weights and dimensions of larger diameter or heavier wall Duroline Pipe furnished on application.

REPUBLIC STEEL CORPORATION

GENERAL OFFICES
CLEVELAND, OHIO

For District Sales Offices Refer to Back Cover of Republic Steel Catalog in Section 13

A REPUBLIC PIPE FOR EVERY PURPOSE

RECOMMENDED USES

It is difficult to make general recommendations of tubular products that will hold true in all localities because of the varying conditions. In addition, some projects are of a less permanent character and the additional cost of a better material is not warranted. However, in general, the following uses are suggested to the architect who has a pipe installation problem.

Structural

Foundation Piling—Republic Electric Weld Pipe is recommended because of perfect roundness and high physical properties. Available in 16 in. O. D. and smaller.

Heating

Excessive Corrosion—Where excessive corrosion will be encountered, black standard weight Toncan Copper Molybdenum Iron Pipe or black extra strong wrought steel pipe should be used.

Normal Conditions—Where all piping, risers and returns are subjected to ordinary conditions, black standard weight wrought steel pipe is suggested.

Air Conditioning

Circulating Water Lines—Because of the corrosive nature of water used in air washers in the central unit type of air conditioning systems, black, standard weight Toncan Copper Molybdenum Iron Pipe should be used. Both threaded and welding fittings are available.

Plumbing

Excessive Corrosion—Where hot and cold water lines and general plumbing installations are subjected to highly corrosive action, galvanized extra strong or standard weight Toncan Copper Molybdenum Iron Pipe is most suitable.

Atmospheric Corrosion—Where atmospheric conditions cause corrosion on tubular products, it is suggested that galvanized standard weight copper bearing steel pipe be used.

Normal Conditions—Where pipe is subjected to ordinary usage and corrosion is mild, black standard wrought steel pipe will ordinarily be satisfactory.

Vents, Drainage and Down-spouts—Tubular products for such uses are generally subjected to atmospheric or alternate wet and dry corrosive action which suggests the use of Galvanized Toncan Iron or galvanized standard weight copper bearing steel pipe. When such corrosive action is mild, galvanized standard weight wrought steel pipe will usually suffice.

Fire Lines—Where water pressures are not excessive, black standard weight wrought steel pipe is recommended. Where water pressure is heavy and fire laws demand, black extra heavy weight wrought steel pipe is suggested.

Sprinkler Systems—Black standard weight wrought steel pipe for all piping.

Gas Lines—Black standard weight wrought steel pipe for all piping.

TONCAN IRON PIPE

THE ADVANTAGES OF TONCAN COPPER MOLYBDENUM IRON AS A PIPE MATERIAL

In the course of tests and service it has been proved that Toncan Iron Pipe possesses certain advantages for building applications which, stated briefly, are:

(1) It resists to a higher degree more of the many and varied types of corrosion than any other ferrous material in its price class. This resistance is not confined to the surface or "skin" of the metal, but is uniform throughout the *entire* wall thickness.

(2) It combines the high rust-resistance of an alloy iron with many of the desirable physical properties of less resistant ferrous materials.

(3) Absolute freedom from scale minimizes the possibility of the pitting type of corrosion.

(4) It possesses a higher resistance than other ferrous materials to impact and to vibration fatigue.

(5) It is one of the most workable of materials.

(6) Unlike other ferrous materials, cold working—cutting, bending, threading—has practically no effect upon the rust-resistance of Toncan Iron Pipe.

(7) It takes a sharp clean thread easily when properly machined.

(8) It welds more easily than other ferrous pipe. The use of Toncan Iron welding fittings and welding rod insures an installation of equal rust- and corrosion-resistance throughout.

(9) It takes and holds a galvanizing coating equal to that found on any other commercial ferrous pipe material, adding the protection of a heavy coating of zinc to the already high rust-resistance of the pipe material itself.

(10) Through its longer trouble-free life it has been found to cost far less per year of service. Its use is more than an economy. It is greater insurance against pipe failures and frequent costly replacements.

TECHNICAL DATA

Sizes

Butt Weld—¼ in. to 1½ in. inc.—iron pipe size.
Electric Weld—2 in. to 12 in. inc.—iron pipe size.
Electric Weld—14 in. O.D. and 16 in. O.D.
Single or double random lengths.

Weights

Standard and Extra Heavy.
Also all weights of pipe suitable for line pipe installations, Water Well Casing and Oil Country Goods.

Finishes

Black, Galvanized, Wrapped or Coated with special coatings as desired. Only single random lengths galvanized.

Specifications

Specifications—Same as for Wrought Steel Pipe except as follows:

Testing of Material—The Toncan Iron from which the pipe is made must show the following physical properties:

Tensile strength	Minimum 48,000 lb. per sq. in.
Yield point	Minimum 30,000 lb. per sq. in.
Elongation in 2 in.	Minimum 30%

How to Specify and Order Toncan Iron Pipe—Toncan Iron Pipe is now stocked for your convenience at all large jobbing centers. Standard weight is threaded and fitted with couplings of the same material as the pipe—Toncan Copper Molybdenum Iron. Extra Heavy, furnished plain ends for welded or special couplings or can be furnished threaded and coupled. All can be supplied Black or Galvanized.

Toncan Iron Pipe should be specified and ordered by its full name—TONCAN IRON PIPE. The blue pipe and blue coupling are your assurance that you have received the longer life pipe for which you have paid.

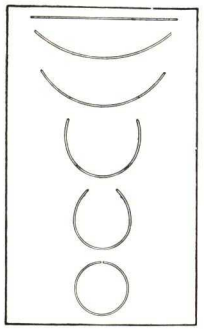
Identification—Every length of Toncan Iron Pipe is painted blue. Couplings are blue and stamped TM.

Literature—The 64-page catalogue, "Toncan Iron Pipe for Permanence" contains interesting and valuable facts concerning the remarkable performance of this rust-resisting pipe. Write for a copy.

TONCAN IRON ELECTRIC WELD PIPE

Combines the Advantages of Electric Welding with Those of Rust-resisting Toncan Iron

Toncan Iron Electric Weld Pipe is the result of combining an unusual welding process with Toncan Iron, for more than 25 years a leader of rust- and corrosion-resisting metals. It totals the advantages of electric welding with the quality of a long-lasting, rust-resisting alloy iron, and in addition, other outstanding features which are briefly enumerated below.



Gradually Forming Flat Plate Into Tubular Form Without Undue Strain on the Material

Features of Electric Weld Pipe

1. 100% Weld—The weld is an electrical resistance weld, made without the use of welding metal. It is smooth inside and outside and has the same tensile strength as the pipe wall. It is, therefore, 100% efficient.

2. Uniform Wall Thickness—Cold forming permits the maintenance of the same uniformity of wall thickness in the finished pipe as was present in the flat strips from which it is rolled. This means a uniform depth of metal at the root of every thread and reduces, to a minimum, the chances of breaks at the joints.

3. Roundness—Pipe made by this process is more nearly a perfect cylinder than is any other pipe because it is formed mechanically without the application of heat.

4. Scale Free—Electric Weld Pipe is clean inside and outside—no scale, no roll marks, no liquor marks, no burrs. Every length is inspected in the flat to insure against possible inside defects.

5. Long Lengths—The fewer joints in a line the lower the cost of construction and the leakage hazard. Electric Weld Pipe is obtainable in solid lengths without mid-weld up to 50 ft.

6. Straightness—Because no heat is used in forming, Electric Weld Pipe emerges from the welder cold and perfectly straight.

7. Strength—Due to the cold working of the metal, the yield point is considerably above that of pipe made by the hot processes. Strength is uniform in wall and weld because electrical resistance welding causes no grain growth at the weld. Thus collapse, broken joints and other expensive failures are avoided.

How Furnished

Toncan Iron Electric Weld Pipe is furnished with threads and couplings, plain ends, bevelled ends or belled ends. Sizes from 2 in. to 16 in. o.d., and in lengths up to 50 ft.

Typical Uses

Water well casing and drive pipe; oil country casing and tubing; power piping; ideal for fabrication and for oil, gas and water line piping. Recommended for various uses in the manufacture of equipment where uniform wall, concentricity and straightness are requisite properties.

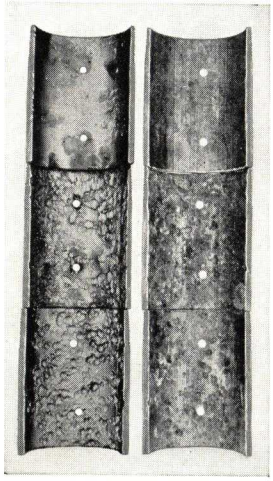
TONCAN IRON PIPE IN CORROSIVE SERVICE

Longer Life Without Extra Cost

That they might know the relative corrosion-resistance of various materials in actual power plant service, one of the large eastern utility companies installed steel pipe, wrought iron pipe and Toncan Iron Pipe in a steam return line in one of their power houses.

The photograph at the right is representative of the appearance of sections of the various pipe materials at the end of two years' service. The materials as shown in the photograph are: *top,* Toncan Iron; *center,* wrought iron; *bottom,* steel.

After 24 months the steel pipe was removed from service due to failure at the threads. At the end of 36 months the wrought iron pipe failed and was removed. The Toncan Iron Pipe was removed from service at *56 months.* When a recent addition was made to this power plant, Toncan Iron Pipe was specified and installed in cold water and steam return lines.



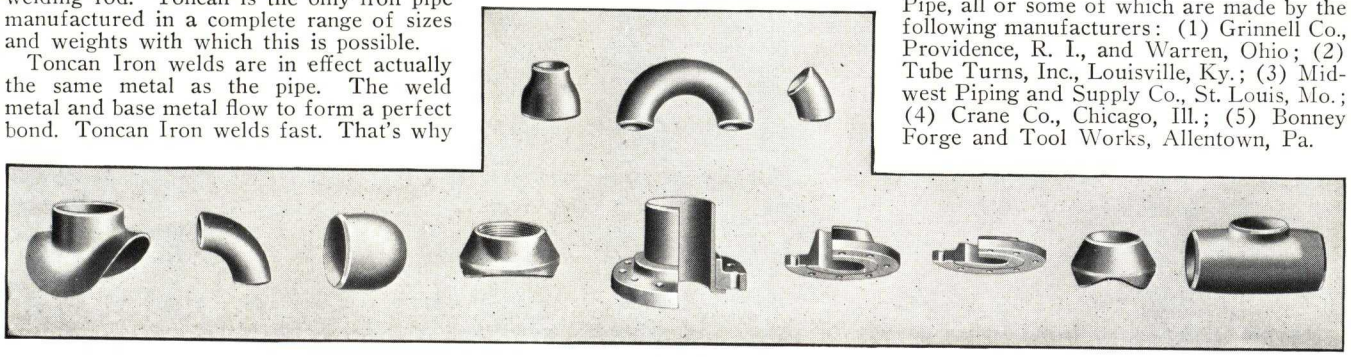
Time and again, Toncan Iron Pipe has given conclusive proof in service that it ranks *first* in resistance to rust and corrosion, among the ferrous metals in its price class. To the buyer and user of pipe this has one important meaning — *longer life and lower cost.* Bare pipe prices are no basis for figuring values. The true yardstick is the cost of the pipe installed divided by the service life. Installation usually costs more than the pipe and fittings, and when failure occurs, the entire installation cost is lost forever. Then it costs money to tear out the old piping, and the original cost must be paid again for replacement. *The best insurance against such costly maintenance is Toncan Iron Pipe.*

TONCAN IRON PIPE WELDING FITTINGS

Keeping pace with the growing trend to the use of welding in pipe installations, Republic has provided for welding fittings for Toncan Iron Pipe. It is now possible, through the cooperation of pipe fitting manufacturers, to obtain high resistance to rust throughout any pipe system—there need be no zone of weakness if Toncan Iron is used in pipe, in welding fittings and in welding rod. Toncan is the only iron pipe manufactured in a complete range of sizes and weights with which this is possible.

Toncan Iron welds are in effect actually the same metal as the pipe. The weld metal and base metal flow to form a perfect bond. Toncan Iron welds fast. That's why Toncan Iron welding fittings are used in so many installations—for speed, economy, long life, safety and uniform corrosion-resistance.

Toncan Iron welding rod and wire are available in the following forms: bare, lime coat, sulcoat and heavy flux coat. Below are shown a few of the standard welding fittings for Toncan Iron Pipe, all or some of which are made by the following manufacturers: (1) Grinnell Co., Providence, R. I., and Warren, Ohio; (2) Tube Turns, Inc., Louisville, Ky.; (3) Midwest Piping and Supply Co., St. Louis, Mo.; (4) Crane Co., Chicago, Ill.; (5) Bonney Forge and Tool Works, Allentown, Pa.



REPUBLIC WROUGHT STEEL PIPE

This pipe is made from uniformly good quality soft weldable wrought steel, rolled from solid ingots. Sufficient crop is cut from the ends to insure sound material, and the steel is given the most approved treatment in heating and rolling. Every piece is carefully inspected and tested. Republic Wrought Steel Pipe threads, flanges and bends easily.

Identification—Each length of pipe is identified with the name "Republic" rolled in raised letters every 3 ft. of length.

Specifications for Manufacture

The manufacturers of Republic Pipe have adopted a rigorous system of testing and inspection, which insures the best material and workmanship. A most rigid inspection is made after the welding of the skelp into the pipe.

In order to insure first class product without necessarily increasing the cost of manufacture, we have adopted and recommend the following specifications for Copper-Bearing Steel and Wrought Steel Pipe.

Process of Manufacture—All pipe shall be made either by the lap or butt-weld process as specified on order, according to the best methods and practice.

Surface Inspection—The pipe must be reasonably straight and free from blisters, cracks or other injurious defects. Liquor marks incidental to the manufacture of lap-welded pipe will not be considered as surface defects. The pipe shall not vary more than 1% either way from being perfectly round or true to the standard outside diameter, except on the small sizes (1½ in. and smaller) where a variation of $\frac{1}{64}$ in. will be accepted. The pipe must not vary more than 5% either way from standard weight.

Threading and Reaming—When required, the pipe must have a good Briggs standard thread. The threads must not vary more than 1½ turns either way when tested with a Pratt & Whitney Briggs standard gauge. All burrs at ends to be removed.

Internal Pressure Test—The test pressures will be applied to the respective sizes of standard butt and lap-welded pipe as indicated in tables.

Testing of Material—The steel from which the pipe is made must show the following physical properties:

Tensile strength .....52,000 to 62,000 lb. per sq. in.
Yield point .....minimum 30,000 lb. per sq. in.
Elongation in 8 in.....minimum 20%

A test piece cut lengthwise from the pipe and filed smooth on the edges shall bend, without fracture, through 180 degrees with an inner diameter at the bend equal to the thickness of the material.

Couplings—The material to be sound and free from injurious defects. Threads must be clean, tapped straight through, and of such pitch diameter as will make a tight joint. Ends must be countersunk.

Thread Protection—Solid tapped rings or split couplings will be provided as thread protectors on all sizes 3½ in. diameter or larger. Protection will be provided for smaller sizes when called for on order.

Additional Specifications—In addition to the above, Republic Pipe is manufactured in accordance with all standard specifications such as, A.S.T.M., A.P.I., etc.

REPUBLIC COPPER-BEARING STEEL PIPE

This type of material is suggested for installations where corrosive conditions similar to atmospheric are encountered. The slightly increased cost is a sound investment which yields increased life of installation.

Identification—Each length of pipe is identified with the name "Republic" rolled in raised letters every 3 ft. of length. Black pipe is painted solid orange. Galvanized pipe is striped orange.

REPUBLIC PIPE—SIZES AND WEIGHTS

TONCAN IRON—REPUBLIC WROUGHT STEEL—REPUBLIC COPPER-BEARING STEEL

In Toncan Iron, sizes ¼ in. to 1½ in. made by an improved butt weld process, absolutely scale-free. Sizes 2 in. to 16 in. O.D., inclusive, made by Republic's Electric Weld Process. All weights and dimensions are nominal.

Standard Weight												Extra Strong					
Size, in.	Diameters, in.		Thickness, in.	Wt., per ft., lb.		Threads per in.	Couplings			Test pressure in pounds		Diameters, in.		Thickness, in.	Wt. per ft., plain ends	Test pressure in pounds	
	External	Internal		Plain ends	Thds. & cpgs.		Diam., in.	Length, in.	Wt., lb.	Butt	Lap	External	Internal			Butt	Lap
⅛*	.405	.269	.095	.24	.24	27	.562	⅞	.030	700	.....	.405	.215	.095	.314	700	.....
¼	.540	.364	.088	.424	.425	18	.685	1	.044	700	.....	.540	.302	.119	.535	700	.....
⅜	.675	.493	.091	.567	.568	18	.848	1⅛	.072	700	.....	.675	.423	.126	.738	700	.....
½	.840	.622	.109	.850	.852	14	1.024	1⅜	.118	700	.....	.840	.546	.147	1.087	700	.....
¾	1.050	.824	.113	1.130	1.134	14	1.281	1⅝	.214	700	.....	1.050	.742	.154	1.473	700	.....
1	1.315	1.049	.133	1.678	1.684	11½	1.576	1⅞	.350	700	.....	1.315	.957	.179	2.171	700	.....
1¼	1.660	1.380	.140	2.272	2.281	11½	1.950	2⅛	.546	700	1000	1.660	1.278	.191	2.996	1500	2500
1½	1.900	1.610	.145	2.717	2.731	11½	2.218	2⅜	.758	700	1000	1.900	1.500	.200	3.631	1500	2500
2	2.375	2.067	.154	3.652	3.678	11½	2.760	2⅝	1.233	700	1000	2.375	1.939	.218	5.022	1500	2500
2½	2.875	2.469	.203	5.793	5.819	8	3.276	2⅞	1.755	800	1000	2.875	2.323	.276	7.661	1500	2000
3	3.500	3.068	.216	7.575	7.616	8	3.948	3⅛	2.549	800	1000	3.500	2.900	.300	10.252	1500	2000
3½	4.000	3.548	.226	9.109	9.202	8	4.591	3⅝	4.328	.....	1000	4.000	3.364	.318	12.505	.....	2000
4	4.500	4.026	.237	10.790	10.889	8	5.091	3⅝	5.410	.....	1000	4.500	3.826	.337	14.983	.....	2000
4½	5.000	4.506	.247	12.538	12.642	8	5.591	3⅝	5.984	.....	1000	5.000	4.290	.355	17.611	.....	1800
5	5.563	5.047	.258	14.617	14.810	8	6.296	4⅛	9.158	.....	1000	5.563	4.813	.375	20.778	.....	1800
6	6.625	6.065	.280	18.974	19.185	8	7.358	4⅛	10.823	.....	1000	6.625	5.761	.432	28.573	.....	1800
7	7.625	7.023	.301	23.544	23.769	8	8.358	4⅛	12.390	.....	1000	7.625	6.625	.500	38.048	.....	1500
8	8.625	8.071	.277	24.696	25.000	8	9.420	4⅝	15.843	.....	800	8.625	7.625	.500	43.388	.....	1500
8	8.625	7.981	.322	28.554	28.809	8	9.420	4⅝	15.843	.....	1000	.....	.....	.....	.....	.....	.....
9	9.625	8.941	.342	33.907	34.188	8	10.420	5⅛	19.752	.....	900	9.625	8.625	.500	48.728	.....	1500
10	10.750	10.192	.279	31.201	32.000	8	11.721	6⅛	33.923	.....	600	.....	.....	.....	.....	.....	.....
10	10.750	10.136	.307	34.240	35.000	8	11.721	6⅛	33.923	.....	800	.....	.....	.....	.....	.....	.....
10	10.750	10.020	.365	40.483	41.132	8	11.721	6⅛	33.923	.....	900	10.750	9.750	.500	54.735	.....	1200
11	11.750	11.000	.375	45.557	46.247	8	12.721	6⅛	36.970	.....	800	11.750	10.750	.500	60.075	.....	1100
12	12.750	12.090	.330	43.773	45.000	8	13.958	6⅛	48.266	.....	600	.....	.....	.....	.....	.....	.....
12	12.750	12.000	.375	49.562	50.706	8	13.958	6⅛	48.266	.....	800	12.750	11.750	.500	65.415	.....	1100

14-in. o.d. to 16-in. o.d. inclusive, also available.

*Made in Steel and Copper-Bearing Steel only.

SPANG, CHALFANT & CO., INC.

Manufacturers of Welded and Seamless Steel Pipe

GENERAL OFFICES

Grant Building, PITTSBURGH, PA.

WELDED MILLS: ETNA, PA. AND SHARPSBURG, PA.

SEAMLESS MILL: AMBRIDGE, PA.

SALES OFFICES

PITTSBURGH, PA., Grant Bldg.
NEW YORK, N. Y., R.C.A. Bldg.
BOSTON, MASS., Consolidated Bldg.
CHICAGO, ILL., McCormick Bldg.
ST. LOUIS, MO., Boatmen's Bank Bldg.
TULSA, OKLA., National Bank of Tulsa Bldg.
ATLANTA, GA., Rhodes-Haverty Bldg.
HOUSTON, TEX., Shell Bldg.
LOS ANGELES, CALIF., Transamerica Bldg.
SAN FRANCISCO, CALIF., Russ Bldg.

Products and Facilities

SPANG, CHALFANT WELDED and SEAMLESS TUBULAR STEEL PRODUCTS, including Standard, Extra Strong and Double Extra Strong Pipe, both black and galvanized for all purposes, and Spang "Copper-Clude" Pipe.

This company is the oldest pipe mill operating in America (established 1828) and has a record of many years of satisfactory service to users of tubular products of all kinds and for all purposes. The present facilities include plants for the manufacture of butt weld pipe ⅛ to 3-in. inside diameter, lap weld pipe 1¼-in. inside diameter to 24-in. outside diameter, inclusive, and seamless pipe 1¼-in. inside diameter to 16-in. outside diameter, inclusive.

Distribution

"Spang" Pipe is nationally distributed through leading jobbers in every important industrial center throughout the country. These distributors carry ample stocks of standard sizes both black and galvanized for every requirement.

Inspection

Every piece of pipe, tubing or casing is carefully inspected during process of manufacture and is tested and inspected after all the operations are finished. All imperfections that are possible to detect are therefore found and eliminated. No defective pipe is knowingly permitted to leave our mills.

Uniform Quality

The special analysis steel used in the manufacture of "Spang" Pipe combines those highly desirable qualities of softness and ductility for easy shaping, threading and bending with an unusual toughness and strength.

CHEMICAL AND PHYSICAL PROPERTIES

Data	Bessemer Steel	Open Hearth Steel		Rephosphorized Steel
	Welded Pipe	Welded Pipe	Grade A Seamless Pipe	Welded Pipe
Chemical Properties				
Manganese	.30 to .60	.30 to .60	.30 to .60	.30 to .60
Phosphorus, not over	.11	.045	.04	.08
Phosphorus, not less than				.045
Sulphur, not over	.065	.06	.06	.06
Physical Properties*				
Tensile strength, lbs. per sq. in.	50,000	45,000	48,000	48,000
Yield point, lbs. per sq. in.	30,000	25,000	30,000	28,000
Elongation in 8 in.	20%	22%		20%
Elongation in 2 in.			40%	

*The material shall conform to the minimum requirements as to tensile properties as shown here.

Finish

Finished pipe shall be commercially straight and free from injurious defects. All burrs at the ends of the pipe shall be removed.

Threading

The dies in our threading and coupling machines are regularly checked and inspected. All "Spang" threaded pipe is noted for its clean cut, true threads and its accuracy of pitch and taper. This assures good tight joints at all times.

Galvanizing

All galvanized pipe is processed by the most improved modern methods, assuring a uniform protective coating, both inside and outside, that will not flake off.

Guarantee

We guarantee to replace such goods as prove defective, or allow credit for same, at our option. No claim for damages beyond the price of the tubular goods will be considered and no charge for labor or expense of repair will be allowed.

Identification of Pipe

"Spang" Welded Pipe

All welded pipe in sizes ½ in. and larger is marked with the name "Spang" rolled into every length during the process of manufacture.

"Standard" Seamless Pipe

"Standard" seamless pipe is marked with a designating mark "Standard" stamped into the finished product.

Spang "Copper-Clude" Pipe

Spang "Copper-Clude" is the trade-name for our steel pipe which has a percentage of pure copper added. This pipe is soft, easy to work, but highly resistant to corrosion, making it ideal for exposed piping jobs where severe atmospheric conditions are present (alternate wet and dry, etc.).

To identify—Spang Black "Copper-Clude" is solidly coated copper tan color for sizes up to 6 in. only, over 6-in. sizes show two longitudinal stripes diametrically opposite each other, same as the marking on galvanized "Copper-Clude"; galvanized "Copper-Clude" carries two bright copper tan color stripes the entire length of each piece of pipe.

Prices and complete information on request.

WHEELING STEEL CORPORATION

Manufacturers of COP-R-LOY

GENERAL OFFICES

WHEELING, W. VA.

DISTRICT OFFICES

ATLANTA, GA., Healey Building
BOSTON, MASS., Statler Building
BUFFALO, N. Y., Liberty Bank Building
CHICAGO, ILL., Willoughby Tower Building
CINCINNATI, OHIO, Carew Tower
DALLAS, TEX., Dallas Bank and Trust Building
DETROIT, MICH., Fisher Building
LOS ANGELES, CAL., Edison Building
NEW ORLEANS, LA., Whitney Building
NEW YORK, N. Y., Equitable Building
PHILADELPHIA, PA., Girard Trust Co. Building
ST. LOUIS, MO., Bell Telephone Building
SAN FRANCISCO, CAL., Rialto Building
SEATTLE, WASH., Northern Life Tower

Products

WHEELING "COP-R-LOY" supplied in Standard Black and Galvanized Pipe, Black and Galvanized Sheets, Special Finished Sheets; WHEELING STEEL PIPE; TIN and TERNE PLATE.

Also Wheeling Black and Galvanized Steel Sheets, Long Terne Sheets, Locker Sheets, etc.

"Cop-R-Loy" Pipe

"Cop-R-Loy" Pipe provides the composite of all steel pipe qualities and advantages. In addition, it has a copper content by admixture which metallurgical science has established as a means to maximum ferrous pipe durability under the majority of service conditions. It is pipe you hear discussed frequently and is used extensively by request of architects, building and industrial engineers. As a rust retardant under atmospheric conditions it has won genuine distinction. It can be specified with an assurance of economy and satisfaction.

"Cop-R-Loy" Pipe provides all the structural strength of steel pipe so necessary to present day piping installations. It cuts easily and threads readily without filling dies. Also it is quite readily bent cold. No better pipe for any plumbing, heating or waste lines need be desired.

Identification — Substitutes and imitations are avoided by insisting upon the pipe that has the name "Cop-R-Loy" rolled in the pipe wall. Genuine Wheeling "Cop-R-Loy" Pipe, in the black finish, has a maroon coating; galvanized "Cop-R-Loy," a maroon stripe, in addition to the name.

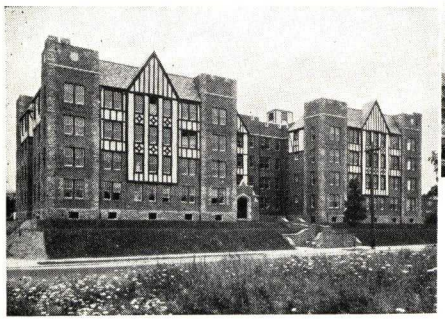
"Cop-R-Loy" Nipples—Nipples for "Cop-R-Loy" Pipe installations are made of "Cop-R-Loy" Pipe by leading nipple manufacturers. Names on request. Specify "Cop-R-Loy Nipples" throughout.

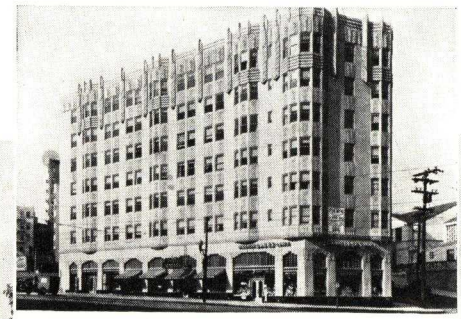
Full Standard Weight—"Cop-R-Loy" Pipe is available black or galvanized, in standard weights and sizes ⅛ to 12 ins.

Wheeling Steel Pipe

Wheeling Steel Pipe is supplied in the same weights and sizes.

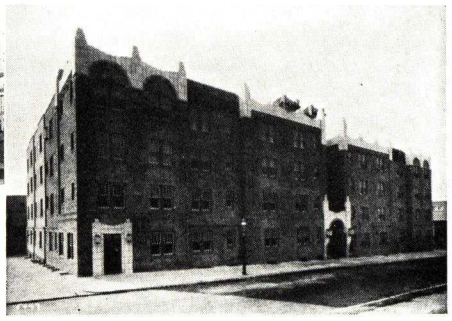
A modern Philadelphia structure is the Sprague and Horter Street Apartments, designed by Stetler and Deysher. Cop-R-Loy Pipe for plumbing and heating was installed by Harry Copperman, furnished by Fleck Bros., Philadelphia





The Allen Apartments and shopping center, San Francisco, California, is Cop-R-Loy equipped throughout all plumbing. The contract was executed by E. Sugarman, Richmond Sanitary Company supplying the pipe. Architect: Bertz, Winter & Maury

In Philadelphia, Pennsylvania, the Conlyn Towers Apartments, is equipped with Cop-R-Loy Pipe in hot and cold water lines, vent wastes and in the heating system. The installations were by W. F. Rentschler & Brother, Fleck Bros., distributors



"Cop-R-Loy" Sheets

"Cop-R-Loy" Galvanized Sheets are universally used for sheet metal work in all types of building construction; particularly for ventilating systems, "Cop-R-Loy" has offered many economies with all the desirable features of durability and workability. All gauges and sizes of "Cop-R-Loy" Sheets required for sheet metal and ventilating work are manufactured and are supplied contractors by leading distributors. Specify "Wheeling Cop-R-Loy Galvanized Sheets."

THE AMERICAN BRASS COMPANY

Manufacturers of Anaconda Brass, Copper and Nickel Silver Pipe; Copper Tubes and Fittings

GENERAL OFFICES

WATERBURY, CONNECTICUT

MANUFACTURING PLANTS

WATERBURY, CONNECTICUT
ANSONIA, CONNECTICUT
TORRINGTON, CONNECTICUT
BUFFALO, NEW YORK
DETROIT, MICHIGAN
KENOSHA, WISCONSIN

IN CANADA: Anaconda American Brass, Limited, NEW TORONTO, ONT.

OFFICES AND AGENCIES IN PRINCIPAL CITIES

For Other Pages, see File Index

ANACONDA "85" RED BRASS PIPE
For Highly Corrosive Waters

The present perfect condition of installations of ANACONDA "85" Red Brass Pipe after 13 to 20 years of actual service under the most unfavorable water conditions, substantiates the results of laboratory research, indicating that this is as high a quality of corrosion-resisting pipe as is commercially obtainable. It contains 85% of copper and meets requirements of Government Specifications for Grade A Water Pipe. It is unqualifiedly recommended for distribution lines carrying ground waters and colored surface waters, particularly when drawn from sources of peaty origin, and mechanically filtered waters which may be high in carbonic acid content and low in alkalinity. Also for underground service lines with threaded fittings.

ANACONDA "67" BRASS PIPE
For Normally Corrosive Waters

This brass pipe alloy contains 67% of copper and meets Government Specifications for Grade B pipe. It is suggested for distribution lines in the many localities where normal water conditions prevail; that is, when waters are not drawn from peaty sources, shallow walls, tubular wells or filter galleries in lowlands along river beds, and where filtered waters are not of high permanent hardness.

ANACONDA COPPER TUBES

With the perfection of the solder fitting, there has been an increasing use of copper tubes for general plumbing and heating purposes where conditions of pressure and temperature are not excessive.

Strong, workmanlike installations are made with ANACONDA Copper Water Tubes and ANACONDA Solder Fittings. Labor costs are lower than with standard size pipe and threaded fittings. Furthermore, elimination of threading permits thinner tube walls and the cost of these copper tubes is correspondingly less per foot than that of heavier pipes. In fact, a complete installation costs very little, and often no more, than one of rustable materials.

Type K Tubes—The heaviest grade, Type K, is recommended for underground service, general plumbing purposes and heating lines. Conforming to Type K requirements of U. S. Government Specification WW-T-799 and A.S.T.M. Specification B-88-33, these tubes are stamped at frequent intervals with the words *"Anaconda Type K"*. For connecting gas and oil appliances, these tubes have been listed and labeled under Re-examination Service by Underwriters' Laboratories, Inc., and tubes for this purpose are marked *"G-Anaconda-O Type K"*.

Type L Tubes—ANACONDA Type L Copper Tubes, somewhat lighter than Type K, are suitable for interior plumbing including drainage lines, and heating lines as well. These are stamped *"Anaconda Type L"*, and meet all requirements of the foregoing specifications for Type L tubes.

Type M Tubes—Lighter than Type L and furnished in hard temper only, these tubes have nevertheless been used with apparent success for plumbing purposes. However, for underground, interior plumbing and heating lines, THE AMERICAN BRASS COMPANY recommends the heavier Type K tubes as providing a greater margin of safety.

ANACONDA FITTINGS

There is an ANACONDA Fitting for every copper tube requirement in plumbing, including drainage, heating and air conditioning. These fittings are available in three types:

Cast Bronze in sizes from ¼ to 12 in. (including sizes for drainage lines); Wrought Copper in sizes from ¼ to 4 in.; and Flared Tube in sizes from ⅛ to 2 in.; couplings, unions, valves, and reduction and adapter combinations. For ready identification, all fittings carry the ANACONDA trademark cast or stamped into the metal.

Accuracy of Dimensions—ANACONDA Deoxidized Copper Water Tubes and Anaconda Fittings are all finished to the close tolerance required by the A.S.T.M. and Government Specifications.

All ANACONDA Solder Fittings are tested to 90 lbs. air pressure under water, which is the equivalent of 400 to 450 lbs. water pressure. They are so designed as to offer a minimum of resistance to the flow of water.

Strength of Soldered Joints—The strength and dependability of joints made with ANACONDA Solder Fittings and Copper Tubes are indicated by tests in which ¾-in. joints withstood a straight pull of over 7000 lbs. at 70° F. At all temperatures between 70° F. and 210° F., the joints withstood internal pressures in excess of 2000 lbs. p.s.i.

SERVICE TO ARCHITECTS

The Technical Department of the American Brass Company has on hand reliable data on water conditions in many sections of the country, which is available to interested architects. If specific information on water conditions in any locality is not available, the American Brass Company is prepared to assist in determining the character of the water and recommend the suitable grade of pipe to use.

BRIDGEPORT BRASS COMPANY

BRIDGEPORT, CONN.

"Plumrite" Brass and Copper Pipe

"Bridgeport" Copper Water Tube and Plumbers' Brass Goods

BRANCH OFFICES IN PRINCIPAL CITIES

Large Warehouse Stocks Carried in Bridgeport, Chicago, Cleveland, Denver, Houston, Newark, Los Angeles, Providence and San Francisco

"PLUMRITE" BRASS PIPE RECORD OF OVER 50 YEARS

"PLUMRITE" BRASS AND COPPER PIPE

Time, the Real Test of "Plumrite" Pipe

BRIDGEPORT BRASS COMPANY has been making brass and copper pipe for over 50 years. It is installed in some of the finest and largest buildings in the country. This material is recommended for the highest quality work—large buildings, fine homes, general plumbing, heating and air conditioning. Rust-free, healthful, long life, reduced maintenance costs.

Different Pipe Alloys Made to Meet Various Water Conditions

Recommendations and specification numbers briefly follow. If in doubt as to water conditions in your vicinity, please write to our Engineering Laboratory.

For Good Waters

Contains approximately 60% copper and 40% zinc. Known as Muntz Metal. Meets A.S.T.M. specifications B-43-33; Federal Specifications WW-P-351, Grade C; and U. S. Army Specifications 83-5A, Grade C. Can be bent easily when red hot as well as when cold. Very satisfactory. Used extensively in some of the finest buildings in the country during the past 50 years.

For Good Water Conditions

Contains 65% to 68% copper. Meets A.S.T.M. Specifications B-43-33; Navy 44-P-12, Grade B; Federal Specifications WW-P-351, Grade B; and U. S. Army Specifications 85-5A. All bends must be made when the metal is cold.

For Corrosive Waters, Artesian Well Water Underground Service

Contains approximately 85% copper, 15% zinc. Also known as red brass. Best grade of brass pipe made. Meets U. S. Navy Specifications 44-P-12, Grade A; Federal Specification WW-P-351 and U. S. Army Specifications 83-5A. Meets A.S.T.M. Specifications B-43-33. For highly corrosive waters—hot and cold sea water, corrosive artesian well water. For general plumbing, heating and underground installations.

For Corrosive Waters, Underground Service

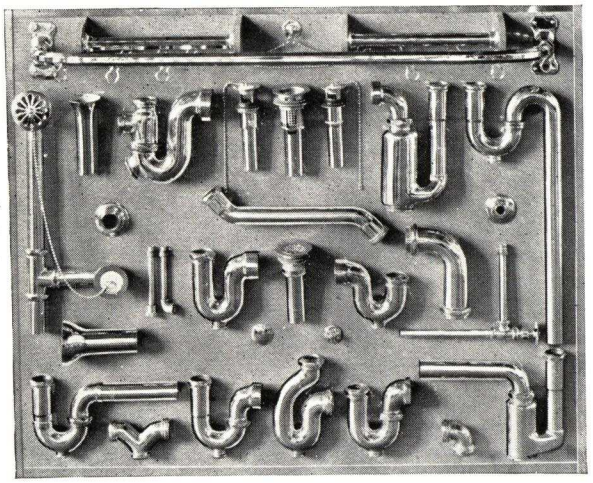
Contains approximately 99.9% copper. Meets A.S.T.M. Specifications B-42-33; U. S. Navy Specification No. 44-P-2; Federal Specification WW-P-377. Recommended for same conditions as are given under "Bridgeport Plumrite 85%".

SUGGESTED EQUIVALENT PIPE SIZES

Street service and cold water lines		Hot water lines	
Brass or copper	Iron	Brass or copper	Iron
½″	¾″	½″	¾″
¾″	1″	½″	1″
1″	1¼″	¾″	1¼″
1¼″	1½″	1″	1½″
1½″	2″	1¼″	2″
2″	2½″	1½″	2½″
		2″	3″

PLUMBERS' BRASS GOODS

BRIDGEPORT BRASS COMPANY makes a distinctive line of Plumbers' Brass Goods such as traps, sink plugs, bath wastes, basin supplies, etc. Line very complete and up-to-date. Supplied in attractive and durable chrome finishes.



BRIDGEPORT PRODUCTS

PLUMRITE BRASS AND COPPER PIPE.

COPPER WATER TUBE.

BRIDGEPORT-ARCO WROUGHT COPPER FITTINGS.

PLUMBERS' BRASS GOODS.

ROOFING COPPER.

DURONZE (silicon copper alloy) SHEETS for storage tanks, range boilers, automatic heaters.

SEAMLESS TUBES.

WELDING ROD AND WIRE.

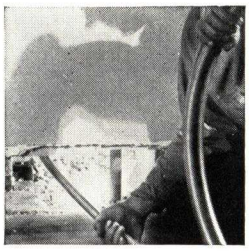
BRASS AND COPPER MILL PRODUCTS.

WEIGHTS OF BRASS AND COPPER PIPE—S.P.S. REGULAR

Size, in.	O. D., in.	I. D., in.	Wall thickness, in.	Weight per foot, lb.			Plumrite 85%	
				Plumrite Standard and 67%	Plumrite 85%	Plumrite copper	Bursting pressure, lb.	Safe working pressure, lb.
⅛	0.405	0.281	0.0620	0.246	0.253	0.259	12,200	1935
¼	.540	.375	.0825	.437	.450	.460	12,300	1950
⅜	.675	.494	.0905	.612	.630	.643	12,000	1905
½	.840	.625	.1075	.911	.938	.957	10,200	1620
¾	1.050	.822	.1140	1.24	1.27	1.30	8,600	1365
1	1.315	1.062	.1265	1.74	1.79	1.83	7,700	1220
1¼	1.660	1.368	.1460	2.56	2.63	2.69	7,000	1110
1½	1.900	1.600	.1500	3.04	3.13	3.20	6,300	1000
2	2.375	2.062	.1565	4.02	4.14	4.23	5,200	825
2½	2.875	2.500	.1875	5.83	6.00	6.14	5,200	825
3	3.500	3.062	.2190	8.31	8.56	8.75	5,000	790
3½	4.000	3.500	.2500	10.85	11.17	11.41	5,000	790
4	4.500	4.000	.2500	12.29	12.66	12.94	4,400	700
4½	5.000	4.500	.2500	13.74	14.15	14.46	4,000	635
5	5.563	5.062	.2505	15.40	15.85	16.21	3,500	555
6	6.625	6.125	.2500	18.44	18.99	19.41	3,000	475
8	8.625	8.000	.3125	30.05	30.95	31.63	2,900	460
10	10.750	10.019	.3655	43.91	45.20	46.22	1,700	430

BRIDGEPORT COPPER WATER TUBE
BRIDGEPORT-ARCO SOLDER TYPE FITTINGS

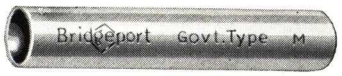
BRIDGEPORT COPPER WATER TUBE



99.9% pure copper—oxygen free—non-rusting—resists corrosion from soil and water.

Uses—General plumbing and heating lines, underground service, lawn sprinkler systems, fuel oil lines, air conditioning and refrigeration.

Economical—Because it is thin walled copper pipe, connections are made with either solder type or compression type fittings. Freedom from rust and low internal friction make possible the use of smaller sizes than rustable materials. Complete copper installation can be made for approximately the same cost as rustable piping.



Supplied in Three Grades

Type K

—*Type K* recommended for general plumbing and heating; underground water service and lawn sprinkler systems; fuel oil lines.

Type L

Type L for general plumbing and heating lines.

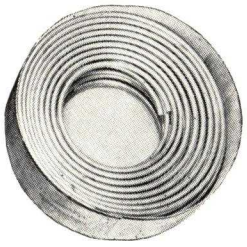
Type M

Type M supplied in hard straight lengths only—for general plumbing purposes—lighter grade.

The above meet A.S.T.M. Specification B-88-33; Federal Specification WWT-799.

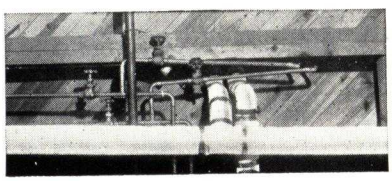
General Plumbing—The soft flexible coils save fittings—can be bent easily. Excellent for replacing plumbing and heating lines and for new work. Can be "fished" in walls and saves tearing up property. Hard straight lengths for exposed lines—neat and workmanlike. Solder type fittings recommended.

Heating Lines—Attractive and very practical—especially for replacements and modernization work. Smaller sizes cut down waste, heat and radiation losses. Solder type fittings recommended.



Air Conditioning and Refrigeration—Types L and M extensively used and very satisfactory.

Fuel Oil Lines—Type K soft with compression fittings acceptable by Fire Underwriters. Makes a very satisfactory installation.



Underground Service—Used by many water companies for connections between mains and house meters. The long soft coils can be bent around obstructions. Saves fittings. Type K with compression fittings recommended. For lawn sprinkler systems, Type K with solder type fittings generally used.

Technical Literature and Information—Write for booklets "Water Pipe Sizes," "Plumrite Brass Pipe," "Copper Water Tube."

BRIDGEPORT-ARCO FITTINGS

Solder type—wrought copper.

Made in sizes up to 4 in. inclusive, and carried in stock for immediate delivery.

Advantages of Wrought Copper Fittings—Absolutely non-porous; true copper to copper connections; same expansion as copper tubing; can be soldered more quickly than cast fittings; less loss of pressure because of less internal friction; neat and trim in appearance; makes a splendid looking job.

BRIDGEPORT COPPER WATER TUBE

Size		GOVERNMENT TYPE K Hard or soft temper in straight 20-ft. lengths. Soft temper in 30, 45 and 60-ft. coils			GOVERNMENT TYPE L Hard or soft temper in straight 20-ft. lengths. Soft temper in 60 ft. coils			GOVERNMENT TYPE M Hard temper in 20-ft. straight lengths.		
Size, in.	Outside diam., in.	Wall thickness, in.	Weight per ft., lb.	Soft Safe working stress, lb.	Wall thickness, in.	Weight per ft., lb.	Soft Safe working stress, lb.	Wall thickness, in.	Weight per ft., lb.	Hard Safe working stress, lb.
⅜	.500	.049	.269	980	.035	.198	700	.025	.144	800
½	.625	.049	.344	785	.040	.285	640	.028	.203	717
⅝	.750	.049	.418	653	.042	.362	560			
¾	.875	.065	.641	743	.045	.455	516	.032	.328	585
1	1.125	.065	.839	578	.050	.655	445	.035	.464	498
1¼	1.375	.065	1.04	473	.055	.884	400	.042	.681	488
1½	1.625	.072	1.36	443	.060	1.14	369	.049	.940	481
2	2.125	.083	2.06	390	.070	1.75	330	.058	1.46	436
2½	2.625	.095	2.92	362	.080	2.48	305	.065	2.03	396
3	3.125	.109	4.00	348	.090	3.33	289	.072	2.68	368
3½	3.625	.120	5.12	332	.100	4.29	276	.083	3.58	365
4	4.125	.134	6.51	325	.110	5.38	267	.095	4.66	368
5	5.125	.160	9.67	312	.125	7.61	243	.109	6.66	340
6	6.125	.192	13.87	313	.140	10.20	228	.122	8.91	318
8	8.125	.271	25.90	333	.200	19.29	247	.170	16.46	335

CHASE BRASS & COPPER CO.

—INCORPORATED—

SUBSIDIARY OF KENNECOTT COPPER CORPORATION

WATERBURY, CONN.

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NEW ORLEANS, LA.

HOUSTON, TEX.
LOS ANGELES, CALIF.
SAN FRANCISCO, CALIF.
SEATTLE, WASH.

For Other Chase Pages, see File Index

CHASE

CHASE RIGID COPPER WATER TUBE AND SWEAT FITTINGS

For Plumbing and Heating Lines

Chase Sweat Fittings

Chase Sweat Fittings are available for all sizes of copper tube up to and including 12 in. There is a sweat fitting in these sizes for practically every use. Strength, appearance, adaptability and ease of installation have made the sweated fitting increasingly popular in Plumbing, Heating and Air Conditioning work.

Standard Stock Sizes

Type L, Hard Temper—In 20-ft. straight lengths in sizes from ⅜ to 6 in., inclusive.

Type M, Chase Copper Water Tube—In sizes ⅜ to 4 in. in 20-ft. straight lengths.

Distribution

Chase Copper Water Tube and Fittings are distributed through plumbing supply jobbers to plumbers.

Write for the manual on Chase Copper Tube and Fittings, describing its many uses and advantages, for your files.

Chase Copper Water Tube

Chase Copper Water Tube is made from 99.9% pure copper and cannot rust. It will stand any city water pressure many times over. It is made in three gages called Types K, L and M, in accordance with U. S. Government Specifications WWT 799 and A.S.T.M. Specifications B-88-33.

Types L and M are used as explained on this page. The use of Type K is described on the following page.

Chase Copper Water Tube is excellent for most water conditions. There are, however, a few localities in which a special alloy pipe is needed for particular kinds of corrosive water.

The Chase Research Department will gladly offer recommendations on the best kind of pipe to install.

For Plumbing Lines

Type L, hard temper Chase Copper Water Tube is recommended for general plumbing and for use with Chase Copper Sweat Fittings for new installations. It should also be used on all exposed pipe lines, because its rigidity and the trimness of sweat fittings make a better appearance.

Type M, hard temper, Chase Copper Water Tube, used with sweat fittings only, is recommended for general plumbing purposes under normal water conditions. Type M is lighter in weight than Type L, and therefore costs correspondingly less per foot.

For Heating Lines

Type M, hard temper, Chase Copper Water Tube is also used for low pressure heating systems, especially for return lines where the greatest amount of corrosion takes place.

The steam carrying capacity of copper tube is greater than the same nominal size iron pipe. Therefore, many times a smaller size pipe can be used. Because copper is a good conductor of heat and does not radiate heat as fast as iron there is less heat loss and less need for insulation. And when insulating, copper tube takes one size smaller covering than the corresponding size iron pipe.

CHASE FLEXIBLE COPPER WATER TUBE AND FLARED FITTINGS

For House Replacements and Underground Water Services

For Replacement Work

Chase Flexible Copper Water Tube and Flared Fittings are used for all "in-the-wall" replacements and for adding new water supply lines in old buildings. Type K, the heaviest of the water tubes, is recommended for severe conditions, and Type L for general plumbing purposes. Long 45 and 60-ft. coils can be worked down between the walls without opening walls to make connections and oftentimes without removing the old rusted-out pipes.

For Underground Service

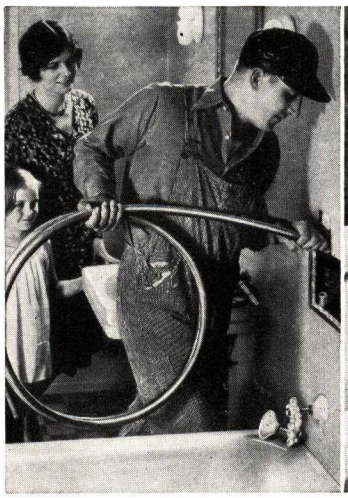
Type K, soft temper, Chase Copper Water Tube and Flared Fittings are ideal for underground water service lines. Many cities use them exclusively. Being flexible, the tube rises and settles with the shifting of the ground. It resists freezing better than rigid pipe. In tests, five successive freezings expanded the outside diameter of ¾-in. tube .218 in. but the wall did not crack. By using one continuous length from water main to curb, and bending it around tree roots, rocks and cement foundations, many fittings are eliminated.

For Oil Burner Use

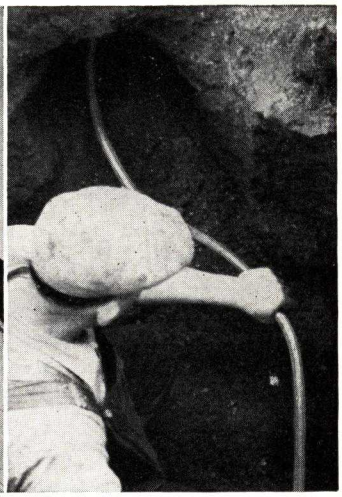
Type K, Chase Copper Water Tube and Flared Fittings, are used for oil burner work; and have been approved by the National Board of Fire Underwriters for gas and oil installations.

Standard Stock Sizes

Type L, soft temper—sizes ⅜ to 1¼ in., inclusive, in coils up to 60 ft. Over 1¼ in. and including 2 in. in 20-ft. straight lengths only.



Chase Flexible Copper Tube is worked through small openings in walls, and under floors. This saves tearing out walls and floors.



For Underground lines, Chase Copper Tube can be bent around rocks or other obstacles eliminating fittings and the time to make joints.

Type K, soft temper—sizes ⅜ to 1 in., in 20-ft. straight lengths and in coils of 45 and 60 ft. Sizes 1¼, 1½ and 2 in. in 20-ft. straight lengths only.

Chase Flared Fittings

Chase Flared Fittings are for use with soft temper copper water tube. They are made from a special alloy with a high copper content which makes them as highly resistant to corrosion as Chase Copper Water Tube.

A series of tests has proved that a flanged joint made with a Chase Flared Fitting is stronger than rigid pipe and a threaded fitting.

Each fitting is inspected, pressure tested and stamped with the Chase trademark.

CHASE BRASS AND COPPER S.P.S. PLUMBING PIPE

Chase Red Brass Pipe

Where threaded pipe is required Chase Red Brass Pipe is the best pipe for general plumbing use. Chase Red Brass Pipe should be used for hot water lines because of the increased corrosiveness of any water as the temperature is raised. This is especially true with a circulating hot water system.

Chase Red Brass Pipe contains 85% copper, 15% zinc as specified in the U. S. Government Master Specifications WWP 351 for Grade A pipe for plumbing.

Chase Red Brass Pipe, in common with other Chase alloys, is readily recognized by the Chase trademark and the name of the alloy stamped every 12 in. along every length.

All sizes up to 4 in. are tested to at least 2000 lbs. per sq. in. water pressure and above 4 in. to at least 1000 lbs. per sq. in.

Chase Copper Pipe

Chase Copper Pipe has a minimum copper content of 99.9%. It is made in standard pipe sizes and hard temper to be used with threaded fittings. It is highly resistant to corrosion from waters of high salinity.

Chase Laboratory Service

If you are in doubt as to what alloy will best meet a specific water condtion, write to us.

The Chase Research Department has had years of experience covering analyses of water conditions throughout the country. These facilities are always available.

PHELPS DODGE COPPER PRODUCTS CORPORATION

GENERAL SALES OFFICES

40 Wall Street, NEW YORK, N. Y.

Products

"Bulldog" Brass and Copper Pipe, Copper Service Tubes, Oil Burner Tubes and Air-Conditioning Tubes of Copper and Copper Alloys; P-G-M Rigid Conduit and Electrical Metallic Tubing.

BULLDOG Brass and Copper Pipe

Bulldog Brass Pipe is made by the Hot-Forged Extrusion Process which gives sound metal as a result of compression at high temperatures under enormous pressures.

BULLDOG Red Brass Pipe—(85-15)

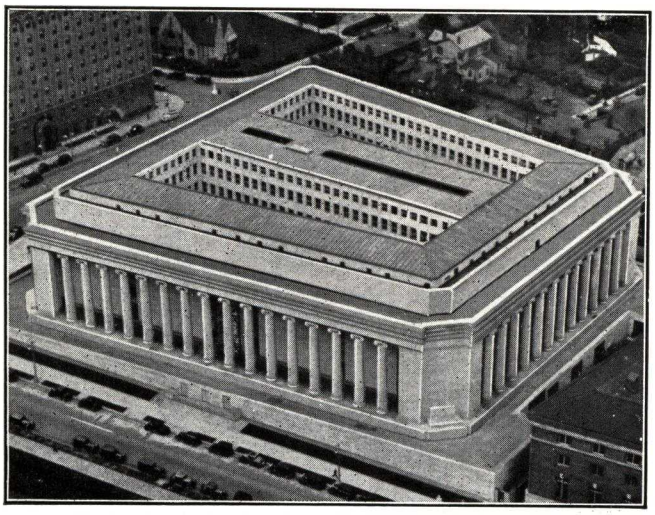
Bulldog Red Brass Pipe is specified where highly corrosive water conditions prevail. It contains 85 percent copper and conforms to government specifications for Grade "A" Pipe. Every length of Bulldog Red Brass Pipe is stamped "Bulldog 85-15" at intervals along its length.

BULLDOG Yellow Brass Pipe

Bulldog Yellow Brass Pipe is recommended for general plumbing service and is specified for use in all localities where normal water conditions prevail. This grade conforms to government specifications for Grade "B" water pipe and is stamped "Bulldog" at intervals on each length.

BULLDOG Copper Pipe

Bulldog Copper Pipe is highly resistant to corrosion from waters of high salinity. It is made in standard pipe sizes and hard temper for use with thread fittings.



Mellon Institute of Industrial Research, Pittsburgh, Pa.
Bulldog Copper Pipe used exclusively

WEIGHT OF BRASS PIPE

Iron pipe size, in.	Outside diam. in.	Standard Lbs. per Ft.				Extra Heavy Lbs. per Ft.			
		Yellow Brass	Copper	Red Brass	Inside diam. in.	Yellow Brass	Copper	Red Brass	Inside diam. in.
⅛	.405	.246	.259	.253	.281	.285	.371	.363	.205
¼	.540	.437	.459	.450	.375	.593	.624	.611	.294
⅜	.675	.612	.644	.630	.494	.805	.847	.829	.421
½	.840	.911	.958	.938	.625	1.191	1.253	1.23	.542
¾	1.050	1.235	1.298	1.27	.822	1.622	1.706	1.67	.736
1	1.315	1.740	1.829	1.79	1.062	2.386	2.509	2.46	.951
1¼	1.660	2.557	2.689	2.63	1.368	3.291	3.460	3.39	1.272
1½	1.900	3.037	3.193	3.13	1.600	3.986	4.191	4.10	1.494
2	2.375	4.017	4.224	4.14	2.062	5.508	5.791	5.67	1.933
2½	2.875	5.830	6.130	6.00	2.500	8.407	8.839	8.66	2.315
3	3.500	8.314	8.741	8.56	3.062	11.24	11.82	11.57	2.892
3½	4.000	10.85	11.41	11.17	3.500	13.66	14.37	14.07	3.358
4	4.500	12.29	12.93	12.66	4.000	16.41	17.25	16.89	3.818
4½	5.000	13.74	14.44	14.15	4.500	20.07	21.10	20.66	4.250
5	5.563	15.40	16.19	15.85	5.062	22.51	23.67	23.18	4.813
6	6.625	18.44	19.39	18.99	6.125	31.32	32.93	32.21	5.750
7	7.625	23.92	25.15	24.63	7.062	41.22	43.34	42.43	6.625
8	8.625	30.05	31.60	30.95	8.000	47.00	49.42	48.39	7.625

Variation from these weights must be expected in practice.

The use of Bulldog Brass and Copper Pipe eliminates repairs and replacements due to rust.

The Copper used in the manufacture of Bulldog Pipe and Tubes is taken from our own mines; smelted and refined in our smelters and refineries, then fabricated into tubes in our modern mills, thus controlling the product from *Mine* to *Market*. This insures uniformity of quality.

BULLDOG Copper Service Tubes

Bulldog Copper Service Tubes are particularly suitable for underground water service connections from street mains to curb-box and from curb-box to building. Because of their flexibility, Bulldog Copper Service Tubes are easily bent for turns and offsets. The necessity of threading is completely eliminated. All Bulldog Copper Service Tubes fit snug into any standard make of fitting (flared type), or sweat fittings of approved manufacture. These tubes can be supplied in maximum length coils of 60 feet for all sizes up to and including 1¼-inch. Maximum straight lengths of 35 feet for all sizes up to and including 2-inch. Made in hard temper for new and exposed work and in soft temper for replacement and underground services.

BULLDOG Type K Tubes

For all underground service lines use Bulldog Type K soft annealed Copper Service Tubes. This is the heaviest grade of tube and is recommended for water, gas, oil, steam and industrial uses.

BULLDOG Type L Tubes

BULLDOG Type L Tubes, lighter than Type K, are recommended for all cold and hot water lines for interior use and are soft annealed or hard drawn.

BULLDOG Type M Tubes

BULLDOG Type M Copper Service Tubes are thin wall tubes for interior use.

Trademark and type are stamped on the side of each tube at regular intervals—in accordance with U. S. Government Spec. WW-T-799 for types K, L and M respectively.

Inspection

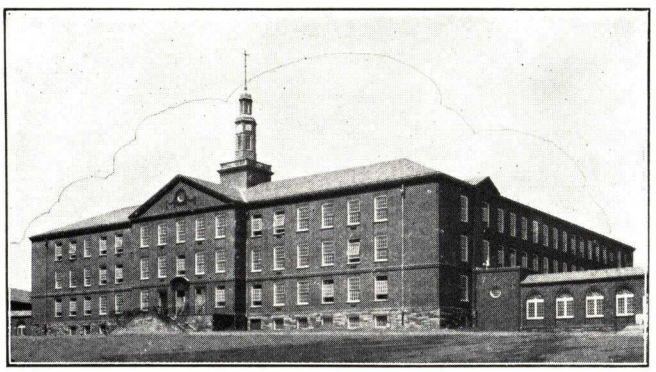
Every length of Copper Service Tubing is inspected and tested before shipment.

GAUGES AND WEIGHTS PER FOOT

Sizes, in.	Outside diam., in.	Type K		Type L *		Type M	
		Gauges	Weight per ft., lbs.	Gauges	Weight per ft., lbs.	Gauges	Weight per ft., lbs.
⅛	.250	.032	.085	.025	.068	.025	.068
¼	.375	.032	.134	.030	.126	.025	.106
⅜	.500	.049	.269	.035	.198	.025	.144
½	.625	.049	.344	.040	.284	.028	.203
⅝	.750	.049	.418	.042	.362	...	...
¾	.875	.065	.641	.045	.454	.032	.328
1	1.125	.065	.839	.050	.653	.035	.464
1¼	1.375	.065	1.04	.055	.882	.042	.681
1½	1.625	.072	1.36	.060	1.14	.049	.94
2	2.125	.083	2.06	.070	1.75	.058	1.46
2½	2.625	.095	2.92	.080	2.48	.065	2.03
3	3.125	.109	4.00	.090	3.33	.072	2.68
3½	3.625	.120	5.12	.100	4.29	.083	3.58
4	4.125	.134	6.51	.110	5.38	.095	4.66
5	5.125	.160	9.67	.125	7.61	.109	6.65
6	6.125	.192	13.87	.140	10.20	.122	8.91
8	8.125	.271	25.92	.200	19.25	.170	16.47

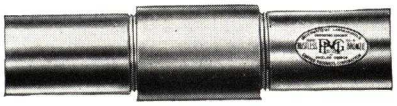
Variations from these weights must be expected in practice.

*Government specifications do not include sizes over 6-in. in Type L in soft temper.



Woodrow Wilson High School, Washington, D. C.
A BULLDOG Copper Service Tubing Installation

P-M-G Electrical Conduit



Left: P-M-G Rigid Conduit

Right: P-M-G Electrical Metallic Tubing

P-M-G Rustless Bronze Rigid Conduit and Electrical Metallic Tubing have been designed for use in hazardous and corrosive locations including bridges, railroads, seaboard locations, mines, chemical plants, oil refineries, distilleries and paint works. Both conduits are listed and labeled by the Underwriters' Laboratories and have withstood the prescribed tests. The corrosion resistance and the non-magnetic characteristics of this metal makes this conduit superior to ferrous alloys.

P-M-G Rustless Bronze Rigid Conduit and Electrical Metallic Tubing are manufactured under careful supervision and are of uniform temper and dimensions. They are seamless and cold drawn and can be threaded, bent and otherwise worked with the same devices employed for steel conduit and tubing.

Fittings—P-M-G Metal Fittings of standard design including box connectors, couplings, nipples, elbows, bends, clamps, hangers, condulets, outlet boxes, switch boxes and accessories in a wide range of sizes and design are available for use with P-M-G Rustless Bronze Rigid Conduit and Electrical Metallic Tubing.

P-M-G ELECTRICAL METALLIC TUBING

Nominal size, in.	O.D., in.	I.D., in.	Wall thickness, in.	Lbs. per foot
⅜	.577	.493	.042	.268
½	.706	.622	.042	.332
¾	.922	.824	.049	.510
1	1.165	1.049	.058	.765
1¼	1.510	1.380	.065	1.120
1½	1.740	1.610	.065	1.300
2	2.190	2.060	.065	1.650

Variations from these weights must be expected in practice.

All sizes are furnished in 10-ft. lengths for assembly with threadless or grooved fittings.

All electrical Metallic Tubing meets the requirements of the Underwriters' Laboratories and bears their labels under file No. E-11082, Guide No. 104LO.

P-M-G RIGID CONDUIT

Nominal size, in.	O.D., in.	I.D., in.	Wall thickness, in.	Lbs. per foot
¼	.540	.382	.079	.434
⅜	.675	.503	.086	.603
½	.840	.636	.102	.897
¾	1.050	.834	.108	1.210
1	1.315	1.075	.120	1.710
1¼	1.660	1.382	.139	2.520
1½	1.900	1.614	.143	2.990
2	2.375	2.077	.149	3.950
2½	2.875	2.519	.178	5.720
3	3.500	3.084	.208	8.160
3½	4.000	3.524	.238	10.670
4	4.500	4.024	.238	12.080

Variations from these weights must be expected in practice.

All sizes are furnished in 10-ft. lengths, both ends threaded with one coupling attached, but may be obtained unthreaded for use with threadless fittings.

All conduit meets the requirements of the Underwriters' Laboratories and bears their labels under file No. E-11172, Guide No. 6606.

(Booklets of above products upon request.)

MEMORANDA

REVERE COPPER AND BRASS INCORPORATED

EXECUTIVE OFFICES AND GENERAL SALES DEPARTMENT

230 Park Avenue, NEW YORK, N. Y.

DIVISION OFFICES AND MILLS

BALTIMORE DIVISION, Baltimore, Md.
DALLAS DIVISION, Chicago, Ill.
TAUNTON-NEW BEDFORD DIVISION, New Bedford, Mass.
MICHIGAN DIVISION, Detroit, Mich.
ROME DIVISION, Rome, N. Y.

DISTRICT SALES OFFICES

ATLANTA, GA., 911 Rhodes-Haverty Bldg.
BOSTON, MASS., United Shoe Machinery Bldg., 140 Federal St.
CINCINNATI, OHIO, 2616 Carew Tower
CLEVELAND, OHIO, 1110 Midland Bldg.
DALLAS, TEX., 1114 Tower Petroleum Bldg.
GRAND RAPIDS, MICH., 922 Grand Rapids National Bank Bldg.
HARTFORD, CONN., 209 Capitol National Bank Bldg., 410 Asylum St.
LOS ANGELES, CALIF., 124 West Fourth St.
MILWAUKEE, WIS., 626 E. Wisconsin Ave.
MINNEAPOLIS, MINN., 724 Metropolitan Bank Bldg.
NEW ORLEANS, LA., 425 Decatur St.
NEW YORK, N. Y., 75 E. 45th St.
PHILADELPHIA, PA., 1201 Architects Bldg.
PITTSBURGH, PA., 727 Gulf Bldg.
PROVIDENCE, R. I., 1215 Industrial Trust Bldg.
ST. LOUIS, MO., 955 Telephone Bldg.
SAN FRANCISCO, CALIF., 562 Russ Bldg.
SEATTLE, WASH., 317 Pioneer Bldg.

Products

REVERE BRASS PIPE, REVERE RED-BRASS PIPE, REVERE COPPER PIPE (Standard Pipe Size), REVERE COPPER WATER TUBE (formerly known as P R Pipe).

For Revere Sheet Copper and Leadtex (lead-coated copper); Cheney Flashing; Revere Thru-Wall Flashing, Architectural Metals, Revecon System, Herculoy, Extruded and Drawn Shapes and Tubes, see File Index.

Facilities

For more than 30 years, REVERE COPPER AND BRASS INCORPORATED has manufactured brass and copper pipe for plumbers' use and seamless brass and copper tubes for various industrial and commercial purposes. The average installation of these products has shown a surprisingly low cost of maintenance and repairs. In fact, many of the installations of 20 to 30 years ago have required no attention whatever in the way of service or repairs.

Every precaution in the way of laboratory control, close inspection and tests during manufacture is taken to safeguard the quality of Revere Brass Pipe, Revere Copper Pipe and Revere Copper Water Tube.

Non-Rusting Water Supply Pipes

To meet various water conditions, installation requirements, and price considerations, Revere manufactures the following non-rusting and life-time plumbing pipes and tubes: Revere Brass Pipe, Revere Red-Brass Pipe, Revere Admiralty Pipe, Revere Copper Pipe (Standard Pipe Size), and Revere Copper Water Tube.

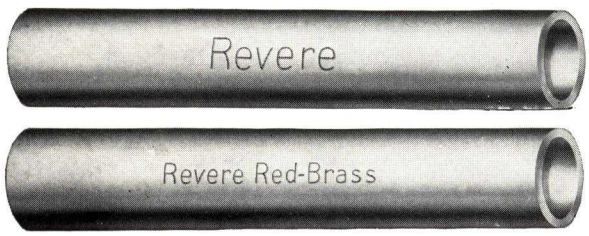
Information and data concerning these products will be found on this and the five following pages.

REVERE BRASS AND COPPER PIPE

Revere Brass Pipe

Revere Brass Pipe (Yellow Brass) is seamless, semi-annealed, and free threading. It is a clean yellow-gold in color with a fine smooth finish. Each length is stamped "Revere" as a means of identification and a guarantee of quality.

This pipe is intended for waters normally corrosive. The selection of pipe should depend on local water conditions. No definition that is all inclusive can be given for a normal water. However, the following conditions are indicative of normalcy in a water supply: Low permanent hardness, a fair degree of temporary hardness, low carbonic acid content and relatively high alkalinity.



The majority of waters in the United States fall into this group. Thus, Revere Brass Pipe assures permanent, trouble-free service in a large percentage of the towns and cities in this country, for both hot and cold water lines.

If there is any doubt about the corrosiveness of the water, an analysis should be made so that a correct grade of pipe may be installed. The making of such an analysis is offered free of charge to architects, engineers, and plumbing contractors.

Revere Brass Pipe has a long record of satisfactory service in all sections of the United States and in all types of buildings. This pipe possesses excellent working and threading qualities, and is fully guaranteed by the manufacturer not to split or to be in any way defective when shipped.

It is made in two mixtures, one containing approximately 60% copper and the other 67% copper. These grades of pipe meet the following specifications:

60% Copper—A. S. T. M. Specifications B43-33 (Muntz Metal); Federal Standard Specifications WW-P-351, Grade "C."

67% Copper—A. S. T. M. Specifications B43-33 (High Brass); Federal Standard Specifications WW-P-351, Grade "B"; and Navy Department Specification 44P12, Grade "B."

Revere Brass Pipe is reasonably priced, the cost being slightly less than that of Revere Red-Brass Pipe.

Revere Red-Brass Pipe

Revere Red-Brass Pipe (85% copper) distinguished by its copper-bronze color, possesses extraordinary resistance to corrosion. It is readily threaded and easily worked. Each length is stamped "Revere Red-Brass" as a means of identification and a guarantee of quality.

This pipe is designed for use with abnormally corrosive waters and should always be used where there is high sulphur and carbon-dioxide content or where heavy chlorination is necessary to insure purity and for all installations in contact with soil or cinder concrete.

Waters drawn from sources of peaty origin, shallow wells, tubular wells or filter galleries in lowlands along river beds ordinarily fall in the class of extremely corrosive waters.

Revere Red-Brass Pipe can also be used for salt (sea) waters used in baths and swimming pools. In fact, where the utmost is demanded from a pipe obtainable commercially at a reasonable cost Revere Red-Brass Pipe should be used.

It is advisable to consider the use of this pipe wherever possible regardless of the present condition of the water supply, as a safeguard against possible changes in corrosiveness due to future changes in source of supply, or purification methods.

Revere Red-Brass Pipe is guaranteed not to split or in any way be defective when shipped.

Revere Red-Brass Pipe meets the following specifications: Federal Standard Specifications WW-P-351, Grade "A"; and Navy Department Specification 44P12, Grade "A;" A. S. T. M. Specifications B43-33 (Red Brass).

Service Installations

Where underground service installations are made with threaded connections. Revere Red-Brass Pipe should be used regardless of water conditions. In these cases, expansion, settling of the fill and other conditions encountered in underground service work must be provided for, as is necessary whenever rigid pipe is used. (Note: For underground service work Revere Copper Water Tube, Type K, Soft Temper, available in 30, 45, and 60-ft. coils, in sizes up to 1" and in lengths of 20 ft. in larger sizes, and joined with compression or soldered fittings is recommended.) See next page for details on Revere Copper Water Tube.

Revere Copper Pipe

(Standard Pipe Size)

Revere Copper Pipe is made of 99.9% pure copper in Standard Pipe Size. Each length is stamped "Revere" as a means of identification and a guarantee of quality.

Revere Copper Pipe, like Revere Red-Brass Pipe, is made primarily for extra-corrosive waters. It is not in as general use as Red-Brass Pipe, but is preferred in certain cities and it gives utmost satisfaction. Pure copper pipe is used also for industrial piping where it withstands severe service.

The above pipe meets the following specifications:

A. S. T. M.—B42-33; Federal Standard Specifications No. WW-P-377; and Navy Department Specification 44P2.

Brass Pipe Specifications

All hot and cold water supply lines, and all branches to plumbing fixtures shall be of Revere Brass Pipe or Revere Red-Brass Pipe, as manufactured by REVERE COPPER AND BRASS INCORPORATED. Each length shall have "Revere" or "Revere Red-Brass" stamped in the metal and shall be guaranteed by the manufacturer not to split or to be in any way defective when shipped.

Hydrostatic Test

Every length of Revere Brass Pipe or Revere Red-Brass Pipe up to and including 4-in. Standard Pipe Size shall withstand, without showing weakness, an internal hydrostatic pressure of 2500 lbs. per square inch. Larger sizes shall withstand a test pressure in proportion to their size in accordance with accepted standards.

Sizes and Delivery

Revere Brass Pipe, Revere Red-Brass Pipe, and Revere Copper Pipe (S. P. S.) are made in standard pipe sizes, both regular and extra heavy. Special commercial sizes and gauges will be made to specifications. These products are readily available from leading plumbing supply distributors.

REVERE COPPER AND BRASS INCORPORATED

REVERE COPPER WATER TUBE

(Formerly known as P R Pipe)

99.9% Pure Copper Tube for Water Supply and Other Uses

HARD TEMPER for New and Exposed Work and General Use

SOFT TEMPER for Replacement Work and Underground Services

Three types—K, L and M—to meet various corrosive conditions and price considerations

USES AND ADVANTAGES OF REVERE COPPER WATER TUBE

What It Is

Revere Copper Water Tube is a cold drawn, seamless, pure copper tube for water supply and other uses. It is completely deoxidized and possesses a gun-barrel finish inside, free from flaws and blemishes. Each length is stamped "Revere Type K, L or M," as a means of identification and a guarantee of quality. Used with Streamline fittings or any standard make of soldered or compressed fittings, it furnishes a complete piping system which is economical to install and, above all, permanently non-rusting, non-clogging, resistant to corrosion and trouble free.

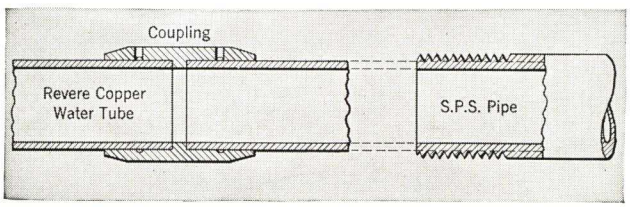
This superior copper tube is made by REVERE COPPER AND BRASS INCORPORATED, with 136 years' experience in the working of copper. For 37 years, Revere has made tubing and piping for plumbing and extremely exacting industrial service of many kinds.

Advantages of Revere Copper Water Tube

A Revere Copper Water Tube installation possesses many advantages, due both to the metal itself and the modern methods of installation.

Being made of pure copper, Revere Copper Water Tube is non-rusting, and under all ordinary conditions provides a lifetime, trouble-free service.

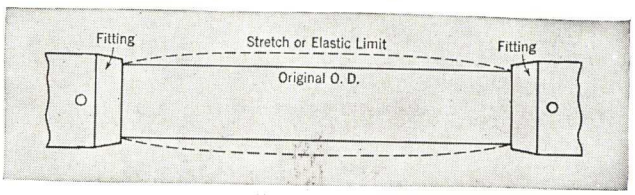
A very important advantage of a Revere Copper Water Tube installation is that it is made without the use of threaded connections.



Illustrating Metal Saving with Revere Copper Water Tube

Revere Copper Water Tube is joined with soldered or compression fittings, which means a considerable economy in metal cost without loss of strength. The wall thickness of Revere Copper Water Tube is uniform throughout.

The ductility of Revere Copper Water Tube is of particular importance in case of accidental freezing. When water freezes in this tube, the tube yields slightly to accommodate the expansion. In laboratory tests, Revere Copper Water Tube has withstood up to twelve freezings without bursting and in actual installations, where water has frozen in the tube, it has been thawed out with a blowtorch and by other methods without any ill effects. An increase of as much as 25 per cent in diameter will not harm an annealed copper tube; water, when it freezes expands about 9 per cent.



Revere Copper Water Tube, Being 99.9% Pure Copper, Expands with Each Freezing, Up to Its Elastic Limit

The use of this tube with soldered or compression fittings now makes possible a superior installation at a reasonable price, so that a life-time piping system of this material can be considered for practically any job.

The gun-barrel finish on the inside of Revere Copper Water Tube insures the rapid passage of water with a minimum of friction. Size for size, copper water tube delivers, and continues to deliver, a maximum amount of water.

There is no rust accumulation with Revere Copper Water Tube. Therefore, it is not necessary to install oversize pipe.

Uses of Revere Copper Water Tube

A Revere Copper Water Tube installation is especially recommended for trouble-free permanent, economical service in the following:

(1) General plumbing, piping and drainage systems.
(2) Water services—from main to meter.
(3) Fuel oil lines—from tank to oil burner and for range burner lines.
(4) Hot water and steam heating systems.
(5) Heat control piping systems.
(6) Lawn irrigation—underground lines and sprays.
(7) Automatic sprinkler systems.
(8) Factory maintenance and piping.
(9) Expansion joints and coils.
(10) Anaesthetic lines.
(11) Compressed air, gas and chemical conduits, refrigeration lines, etc.

(12) Industrial piping as noted below.

In the process industries Revere Copper Water Tube has been found particularly valuable because of its strength and resistance to corrosion in:

(1) Breweries and distilleries for pipe lines, heating and cooling coils, pump lines.

(2) Paper mills for use in blow pits, flumes, screen rooms, calendar stock and air blasts.

(3) Refrigeration and cold storage systems for pipe lines and coils that must resist corrosive chemicals; for coils and coil coolers.

(4) Gas, vacuum and compression systems for conveyance of any volatile gas or maintenance of steady pressures, where strong pipes and leakproof joints are demanded.

Various Public Works projects in the last few years have specified Revere Copper Water Tube for:

(1) Underground water services.

(2) Water filtration for resistance and non-rusting lines to control table and under drain piping.

(3) Gas distribution for service lines.

(4) Heating lines in sewerage disposal tanks.

Other industries using Revere Copper Water Tube with Streamline fittings or compression fittings include:

(1) Marine, aviation and automotive—for any line or joint that must be strong enough to withstand corrosion and excessive vibration, and be light in weight.

(2) Filling stations and garages—for gasoline and compressed air pump lines.

Types of Revere Copper Water Tube

Revere Copper Water Tube is furnished in three types, known as "K," "L" and "M," which meet Government specifications and A.S.T.M. specifications for this product. These three types meet practically all corrosive conditions and price considerations.

Type "K"—*(Formerly known as P. R. Pipe)* has the heaviest wall thickness of the three and is recommended for general plumbing purposes, particularly where water conditions are severe; also for underground services, gas, steam and oil lines and industrial uses. It is joined with either Streamline fittings or compression fittings.

Type "L"—*(Formerly known as P R Interior Tube)* has a medium wall thickness. It is recommended for general plumbing, also gas, steam and oil lines and industrial uses. It is joined with either Streamline or compression fittings. Types "K" and "L" are furnished in both hard and soft tempers.

Type "M"—Furnished in hard temper only, has the lightest wall. It is intended for general plumbing purposes where water conditions are normal and where low cost is a primary factor, also gas, steam and oil lines and industrial uses. It is joined only with Streamline fittings or other standard soldered fittings.

Important Note: Installations with Type M are competitive in price with rustable pipe. This holds true for Type L also when oversize rustable pipe is specified.

On the fourth page following, you will find standard dimensions and weights for the various types of Revere Copper Water Tube, together with other useful data.

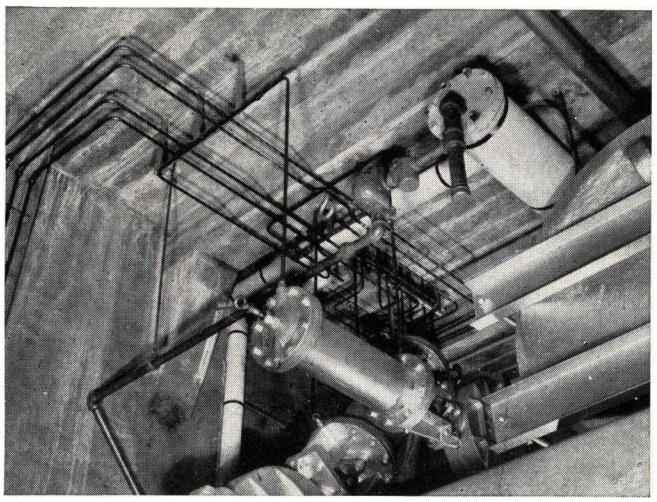
Type "U" Copper Tube

Revere Type "U" Copper Tube is listed by Underwriters' Laboratories, Inc., under "Gas Tubing" for tank to burner oil service.

Revere Dryseal

A dead, soft annealed copper tube made especially for building, repairing and installing refrigerating units, oil burners, and air conditioning systems.

Sizes $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$ and $\frac{7}{16}$ in. are listed under the Re-examination Service of Underwriters' Laboratories, Inc.



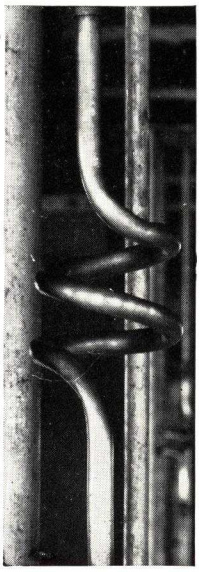
(Photo. Courtesy Hays Manufacturing Co., Erie, Pa.)

Installation of Revere Copper Water Tube Type K (Hard Temper) in Erie, Pa., Filtration Plant

Note the workmanlike appearance and the smooth bends made with the bending tool. On the complete job over 600 fittings were saved by bending Revere Copper Water Tube

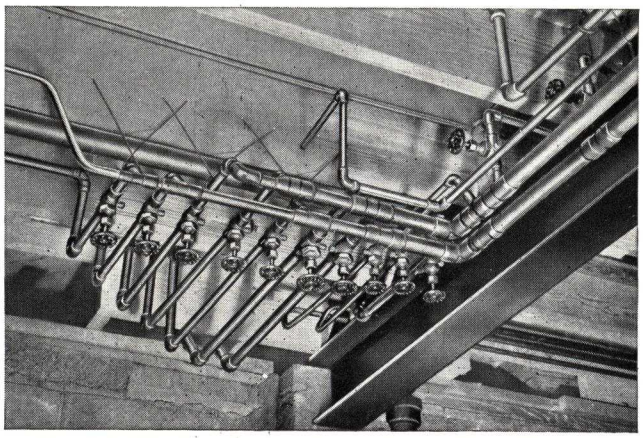
Replacing Worn-out Rustable Pipe with Revere Copper Water Tube in Union Central Building, Cincinnati, Ohio

Over 12,000 feet of tube installed with no interruption of business



One of Many Types of Expansion Loops on Bends

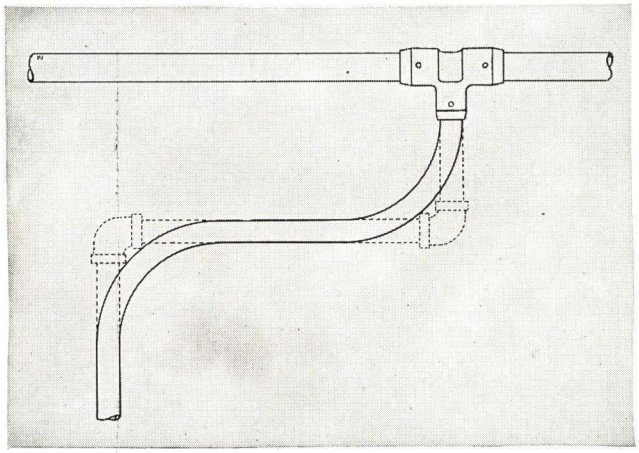
Which it is possible to make with Revere Copper Water Tube



Main Manifold Installation of Revere Copper Water Tube and Streamline Soldered Fittings

Hard Temper Revere Copper Water Tube for New and Exposed Work

Revere Copper Water Tube—hard temper—is recommended for new work and should always be used for exposed piping. In sizes up to 1 in. Type K can be bent cold with an inexpensive hand-operated bending tool. This makes possible the elimination of many fittings, particularly elbows, and produces a quiet, smooth flowing, friction free water supply system. When hard temper



Drawing Showing How Use of Revere Copper Water Tube Allows Making of Easy Bends and Elimination of Angle Fittings

tube is used, there is no danger of sags in either horizontal or vertical lines, and a minimum number of straps and hangers are required. The resultant job is creditable from the standpoint of appearance, service and permanence.

There has been a definite trend from the soft temper to the hard temper in piping installations during the past few years.

Plumbing contractors have found that their men, accustomed to working with rigid pipe, prefer to work with a hard temper, and that the resulting job will stand comparison with any type of piping installation.

Another factor making for decided preference for the hard temper is the use of Streamline and other soldered fittings which, while they can be used with either hard or soft temper, are preferably used with the former.

Revere Soft Temper Copper Water Tube for Replacement Work

Soft Temper Tube is for use wherever flexible piping is desired. It has particular advantages for replacement work where it can be worked between walls and ceilings. Only a few openings are needed, just large enough for working through the tube or for making up connections near the fixtures. This eliminates much of the tearing up ordinarily associated with this type of job with attendant expense for carpentry work, plastering, tiling, painting, etc.

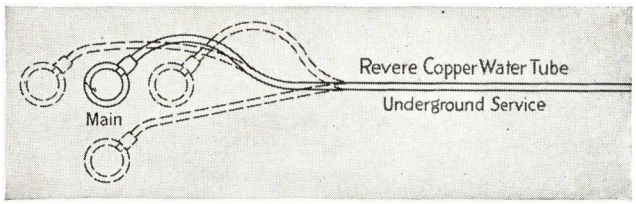
In sizes up to and including 1 inch, the soft temper tube comes in coils of 30, 45 and 60 feet, so that long runs may be made without connections. Thus a number of fittings are saved and installation costs reduced. In most instances the old pipe can be left in place and the expense for removing it is also eliminated.

Revere Copper Water Tube, Soft Temper, can be bent either by hand or with a bending tool, the latter being especially effective where bends are of relatively short radius.

Water Services from Main to Meter

For services from main to meter, soft temper tube should always be used. The long lengths eliminate fittings along the line. The flexibility makes it easy to make bends in cramped quarters around obstructions, etc., and compensates for any travel of the main or settling of the fill. It also eliminates several joints, such as special goosenecks, etc., which are necessary with rigid pipe. Soft temper tube is also recommended for other types of services, such as gas and oil fuel lines from tank to burner.

This tube meets the exacting requirements imposed by underground service, being non-rusting and resistant to corrosion from the liquid or gas inside the tube and from the soil outside.



Illustrating How Revere Copper Water Tube Compensates for Travel and Settling in Water Mains in Underground Services

Fittings

Because of its strong affinity for solder, copper lends itself easily to the use of the soldered joint; because of its great ductility, to the use of compression joint.

The Streamline Soldered Fitting is especially recommended for use with Revere Copper Water Tube. However, this tube is manufactured to fit any standard make of compression or soldered fitting. Both compression and soldered fittings are thoroughly satisfactory when properly installed. The fittings are made in all types, including tees, elbows, couplings, adapters, etc.

Streamline Fittings

The Streamline fitting by means of which patented soldered joints may be made with Revere Copper Water Tube is a thoroughly modern development offering new advantages and economies in all phases of plumbing lines, service lines, heating systems and in numerous phases of industrial piping.

Revere Copper Water Tube may be joined with Streamline fittings in a minimum of space, no room being needed for wrench swing. This makes possible new and exposed installations that are not only serviceable and trouble free, but also present a far more attractive appearance than the ordinary run of S.P.S. pipe installations.

Cutaway Illustration of a Streamline Tee

In industrial piping, as well as in plumbing and heating, a combination of Revere Copper Water Tube and Streamline fittings presents entirely new opportunities for economies and higher efficiency both in replacement work and new installations.

Sizes

Streamline fittings are furnished for all standard sizes of Copper Water Tube up to and including 8 inches and for special sizes up to 10 inches. They are light in weight and only slightly larger than the tube itself which makes for neat appearance.

Making Patented Joints with Streamline Fittings

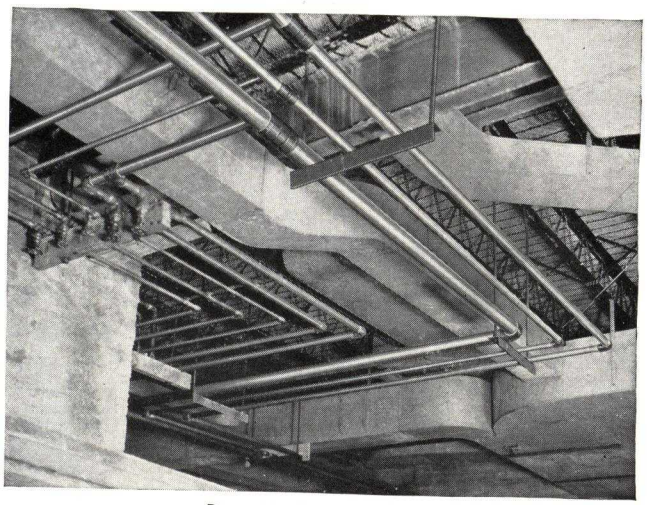
In making a connection with Streamline fittings and Revere Copper Water Tube, the phenomenon of capillary attraction is utilized. The successful functioning of this natural law in making connections with Streamline fittings and Revere Copper Water Tube depends upon close tolerances and clean fluxed surfaces. Revere Copper Water Tube, being especially designed for use with Streamline fittings, meets these close tolerances.

In making a joint, the pipe is cut square with a fine hacksaw and the outside of the pipe at the end is cleaned with sandpaper or sand cloth. The next step is to clean the inside of the fitting with sandpaper or sand cloth until the surface becomes bright. After this a coat of Streamline Soldering Flux is distributed evenly to the outside of the pipe and the inside of the fitting. Then the pipe is slipped into the fitting until it will go no farther, and turned back and forth once or twice which insures an equal distribution of the flux. Using a blowtorch, a drop of solder is melted into the solder feed hole. Heat is applied around the fitting until the drop of solder disappears, indicating proper temperature has been reached.

The Visual Test

The solder should be fed through the feed hole only, until it appears around the end of the fitting. This is conclusive visual evidence of a leak-proof joint and is an exclusive feature of the Streamline fitting.

This fitting incorporates many exclusive mechanical features, such as the solder feed hole, solder feed channel, tapered end, etc., and is fully covered by patents.



Basement—Modern Style

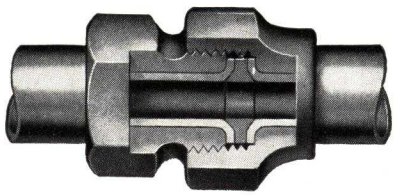
Note air-conditioning ducts and steel joist construction with reinforced concrete arch. Along with these up-to-the-minute materials, 4000 lb. of Revere Copper Water Tube, ½ to 3 in., joined with Streamline Soldered Fittings, were used for all water lines

An installation of Revere Copper Water Tube and Streamline fittings removes practically all resistance to flow. The shoulder inside the fitting causes a continuous, smooth, non-recessed bore, that presents no point where accumulation or friction can be set up.

The joint is strong, vibration proof, and permanently tight, yet may be readily disassembled, if necessary.

Solders and Fluxes

The solder used in making up Revere Copper Water Tube and Streamline Fittings may be a determining factor of success or failure. A 50-50 solder may be used for nearly all connections, but for special services other types of solder are needed, the type solder depending upon the temperatures to be encountered in service. Complete information on solders and their uses as well as the quantity of solder and amount of labor required is given in a special book Revere has prepared on Copper Water Tube. This book will be sent upon request.



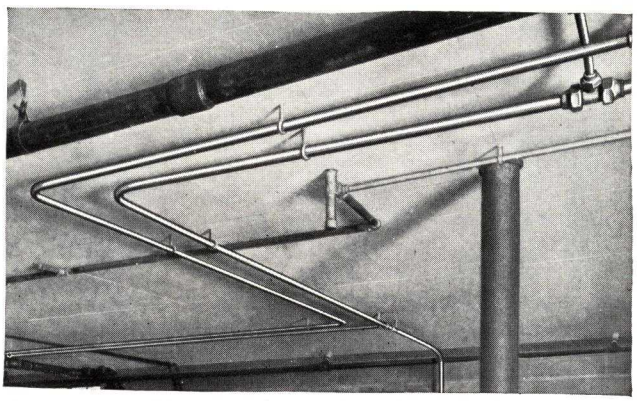
Cutaway Illustration of a Compression Coupling

Compression Fittings

Compression fittings have been used for years with copper tube and make one of the tightest joints known to engineering science. This type of joint has been thoroughly proven by service in locomotives, steamships, factory steam lines, refrigerating systems, automobile and airplane fuel lines and for other uses where an absolutely leak-proof conductor of fluids or gas is required. They have also proven their worth in general plumbing installations and water services from curb to meter.

The compression fitting is cast from bronze, rich in copper content. Its corrosion-resistance is equal to that of the copper tube. Basically all compression fittings consist of two parts, the nut and the coupling or spud. The nut and spud present opposing convex surfaces, which, when tightened, compress the copper between the accurately ground seats, making a very tight, mechanically strong joint.

The ductility of the copper tube is essential to the use of this type of fitting, because the tube must be flanged in order to make up a joint. The Type K, or heaviest weight tube is recommended. Although soft temper tube is, as a rule, used with the compression fitting, where Revere Copper Water Tube (Type K) is specified, either the soft or hard temper may be used.



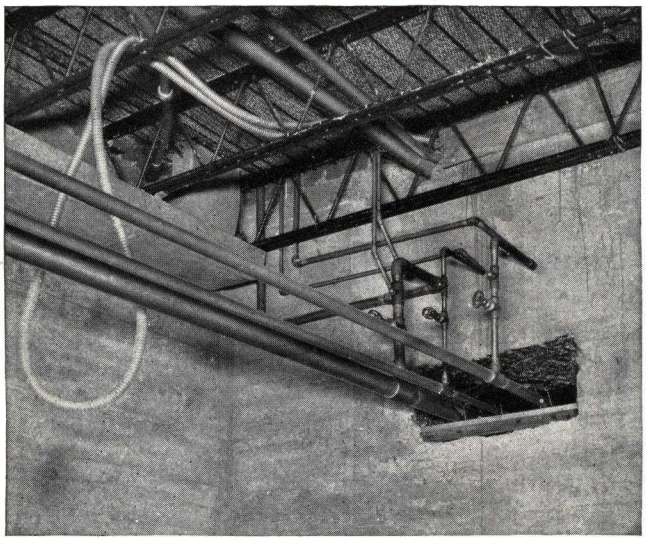
An Installation of Revere Copper Water Tube (Hard Temper) with Compression Fittings

Note the straight runs and the smooth bends made with a bending tool

Water Supply

Revere Copper Water Tube is recommended for nearly all kinds of waters. Exceptions are salt water, where Admiralty Tube is superior to copper, and waters where high free-carbon deoxide is present in combination with low permanent hardness. Under these conditions, Revere recommends the use of Revere Red Brass Pipe rather than copper.

Revere Copper Water Tube meets modern requirements for permanent building materials that can be installed at no penalty in cost. It is difficult to give accurate data on relative cost of Copper Water Tube installations with other types, because special circumstances, such as the nature of the piping, lay-out, local labor rates, experience of the contractor with Copper Water Tube installations, etc., influence the cost of each job. An installation of Revere Copper Water Tube, however, does provide rust-free permanent piping at less cost than other types of rust-free installations. The first cost for installations of Revere Copper Water Tube, Type M, are competitive with those of rustable pipe. In many instances, Type L can also be installed on a competitive cost basis. The ultimate cost of any type is less than that of rustable pipe.

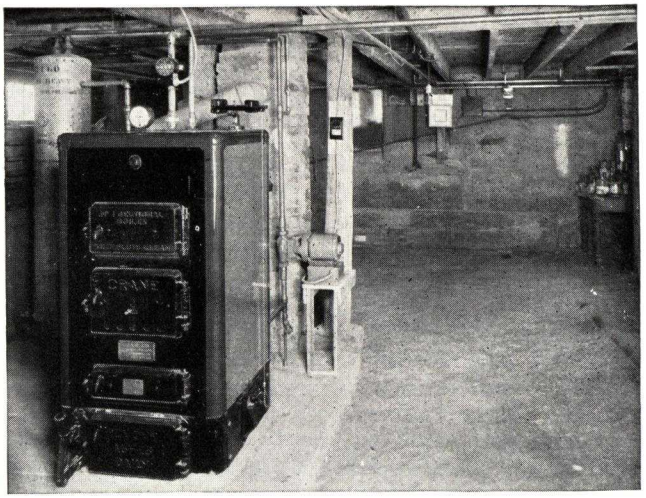


Neat, Compact, Permanent, Revere Copper Water Tube With Streamline Fittings in a Recently Constructed Long Island Residence

Installation Advantages

The installation advantages of Revere Copper Water Tube may be briefly summarized as follows: (1) Saving in metal with consequent saving in cost since threaded connections are not necessary; (2) Saving in fittings because the tube, with certain exceptions, can be bent; (3) Saving in carpentry work, replastering, repainting, etc., on replacement jobs because only small openings are necessary near fixtures and tube can be run down through walls and old piping left in; (4) Saving in space because installations can be assembled in a minimum of space.

Other advantages are lifetime, trouble-free service, reasonable first cost and low ultimate cost, less danger from damage due to freezing because of the ductility of the tube. Joints are as strong as or stronger than the tube itself; friction losses are reduced to a minimum; installations may be readily disassembled when required.



A Forced Circulation Hot Water Heating System Installed in a Syracuse, N. Y., Home

The supply lines include one 1 in. and one ¾ in., and the return line one 1 in. Revere Copper Water Tube (Type M) and Streamline Fittings. Forced circulation is provided by a circulator controlled by aquastat and thermostat. Circulator requirements are 7 gallons per minute against a 24-in. head. The job was figured for 365 ft. of direct cast iron radiation. The basement piping includes Revere Copper Water Tube in sizes 1, ¾, ⅜ and ¼ in. Even with the added advantages of forced circulation, together with aquastat and thermostatic control the actual cost of this Copper Water Tube installation was only slightly more than the estimated cost of a steel pipe gravity installation which did not include these desirable features.

Heating

The advantages of Copper Water Tube previously mentioned for water supply apply with equal force to heating piping. A heating installation of Revere Copper Water Tube and Streamline Fittings is economical to install and efficient in operation. For most heating installations the use of either Type L or Type M will be found satisfactory and economical.

In those cases where corrosion is a factor, it is not necessary to consider the use of over-size pipe because copper does not rust. The rustless feature also eliminates the necessity of using dirt pockets in an all-copper installation which provides a definite saving.

Copper Water Tube is particularly recommended for steam return lines, where the greatest amount of corrosion takes place and which frequently rust out after a comparatively short period of service. Concealed piping, like steam return lines, should also be of copper because the use of this material provides insurance against expensive replacement work in the future.

The outside diameter of most sizes of Copper Water Tube is less than for the corresponding size of threaded pipe; consequently pipe covering can be one size smaller on these sizes, which provides another saving.

Lighter covering can also be used because copper does not radiate heat to the same degree as iron or steel and a lighter covering suffices to prevent heat losses by convection. As a matter of interest, the heat loss in copper by both radiation and convection combined is slightly less than one-half of that of black iron pipe.

The smooth interior surface of Revere Copper Water Tube plus the fact that the inside diameter of the Streamline Fittings is the same as the inside wall of the tube and that there is no burr or seat in the fitting, permits uninterrupted flow and reduces turbulency and prevents the lodgment of sediment and other foreign particles.

The range of sizes of Revere Copper Water Tube is complete so that forced hot water systems in particular may be perfectly balanced and laid out with the utmost efficiency with economy in pipe sizes.

STANDARD DIMENSIONS—WEIGHTS—PROPERTIES

REVERE COPPER TUBE

TYPES USES—RECOMMENDATIONS—DATA	SIZE IN INCHES Nominal	 O. D.	Wall Thickness in Inches	Inside Diameter in Inches	I. D. Area in Square Inches	Test Pressure in Pounds Minimum	Weight in Pounds Per Foot
TYPE K **Temper** — **Working Pressure** Hard — * 400 lbs. Soft — * 250 lbs. ***Steam (saturated) up to 80 lbs. gauge or 325°F.** For Underground Services, General Plumbing Purposes, Severe Water Conditions. Also Gas, Steam, Oil Lines and Industrial Uses. Hard or Soft in straight 20 ft. lengths. Soft in 30 ft., 45 ft. and 60 ft. coils. Coiling over 1¼ in. size not recommended. Bending — Hard or Soft by machine. Soft by hand.	¼	.375	.032	.311	.076	1000	.133
	⅜	.500	.049	.402	.127	1000	.269
	½	.625	.049	.527	.218	1000	.344
	¾	.875	.065	.745	.436	1000	.641
	1	1.125	.065	.995	.778	780	.839
	1¼	1.375	.065	1.245	1.217	630	1.040
	1½	1.625	.072	1.481	1.723	580	1.360
	2	2.125	.083	1.959	3.014	510	2.060
	2½	2.625	.095	2.435	4.657	470	2.920
	3	3.125	.109	2.907	6.637	450	4.000
	3½	3.625	.120	3.385	8.999	430	5.120
	4	4.125	.134	3.857	11.684	420	6.510
	5	5.125	.160	4.805	18.133	400	9.670
	6	6.125	.192	5.741	25.886	400	13.870
	8	8.125	.271	7.583	45.162	400	25.900
	10	10.125	.338	9.449	70.123	400	40.260
	12	12.125	.405	11.315	100.554	400	57.760
TYPE L **Temper** — **Working Pressure** Hard — * 250 lbs. Soft — * 150 lbs. ***Steam (saturated) up to 80 lbs. gauge or 325°F.** For General Plumbing Purposes. Suitable for normal Water Conditions. Also Gas, Steam, Oil Lines and Industrial Uses. Hard or Soft in straight 20 ft. lengths. Soft in 30 ft., 45 ft. and 60 ft. coils. Coiling over 1¼ in. size not recommended. Bending — Hard, not recommended. Soft by hand or machine.	¼	.375	.030	.315	.078	1000	.126
	⅜	.500	.035	.430	.145	1000	.198
	½	.625	.040	.545	.233	1000	.285
	¾	.875	.045	.785	.484	1000	.455
	1	1.125	.050	1.025	.825	880	.655
	1¼	1.375	.055	1.265	1.257	780	.884
	1½	1.625	.060	1.505	1.779	720	1.140
	2	2.125	.070	1.985	3.095	640	1.750
	2½	2.625	.080	2.465	4.772	580	2.480
	3	3.125	.090	2.945	6.812	550	3.330
	3½	3.625	.100	3.425	9.213	530	4.290
	4	4.125	.110	3.905	11.977	510	5.380
	5	5.125	.125	4.875	18.666	460	7.610
	6	6.125	.140	5.845	26.832	430	10.200
	8	8.125	.200	7.725	46.869	430	19.290
	10	10.125	.250	9.625	72.760	430	30.040
	12	12.125	.280	11.565	105.047	430	40.360
TYPE M **Temper** — **Working Pressure** Hard — * 250 lbs. ***Steam (saturated) up to 80 lbs. gauge or 325°F.** For General Plumbing Purposes with soldered fittings only. Suitable for normal Water Conditions. Also Gas, Steam, Oil Lines and Industrial Uses. Hard in straight 20 ft. lengths. Bending not recommended either by hand or machine.	¼	.375	.025	.325	.083	1000	.106
	⅜	.500	.025	.450	.159	1000	.144
	½	.625	.028	.569	.254	890	.203
	¾	.875	.032	.811	.517	710	.328
	1	1.125	.035	1.055	.874	600	.464
	1¼	1.375	.042	1.291	1.309	590	.681
	1½	1.625	.049	1.527	1.831	580	.940
	2	2.125	.058	2.009	3.170	520	1.460
	2½	2.625	.065	2.495	4.889	470	2.030
	3	3.125	.072	2.981	6.979	440	2.680
	3½	3.625	.083	3.459	9.397	430	3.580
	4	4.125	.095	3.935	12.161	430	4.660
	5	5.125	.109	4.907	18.911	400	6.660
	6	6.125	.122	5.881	27.164	370	8.910
	8	8.125	.170	7.785	47.600	370	16.460
	10	10.125	.212	9.701	73.914	370	25.570
	12	12.125	.254	11.617	105.993	370	36.690
TYPE U Revere Type "U" Copper Tube is listed by Underwriters Laboratories Inc. under "Gas Tubing" for tank to burner oil service.	5/16	.049	.2145	.03613	1000	.157	.....
	⅜	.049	.277	.06026	1000	.195	.....
	7/16	.049	.3395	.09052	1000	.233	.....

Revere Co-operation

Revere maintains a corps of experienced representatives at the service of copper water tube users. These men can be of real assistance in the case of first installation or when unusual problems arise.

A 40-page handbook giving comprehensive information on the uses, advantages and applications of Revere Copper Water Tube, together with many useful tables, will be sent on request. Also a 12-page folder on Revere Copper Water Tube for Underground Services.

MEMORANDA

COPPER PIPE AND FITTINGS FOR ★ PLUMBING, HEATING, AIR CONDITIONING AND INDUSTRIAL USE

STREAMLINE

STREAMLINE
PIPE AND FITTINGS DIVISION
MUELLER BRASS CO.
PORT HURON, MICHIGAN

The Company

The Mueller Brass Co. of Port Huron, Michigan, of which STREAMLINE Pipe and Fittings is a division, was incorporated in 1917 and during its industrial life has contributed some outstanding advances to industry. Immediately after the World War its executives had the vision to see the commercial possibilities in brass forgings which, previously, were confined almost solely to the manufacture of munitions. The Mueller Brass Co. is recognized as one of the world's largest manufacturers of brass forgings. The Company's contribution to the electric refrigeration industry has probably more to do, than any other factor, in bringing it to the state of perfection that it has attained today.

In 1924 the Mueller Brass Co. invented and marketed a product known as Mueller Copper Service Pipe and Fittings for waterworks service use. In a few short years this product has become standard with an ever-growing number of waterworks systems throughout the United States and Canada.

The Mueller Brass Co.'s latest and most revolutionary advance for plumbing, heating and industrial uses is their product known internationally as STREAMLINE Copper Pipe and Fittings described and illustrated in this catalog.

Reliability

The Mueller Brass Co.'s rating in Bradstreet's is over one million dollars—first grade of credit.

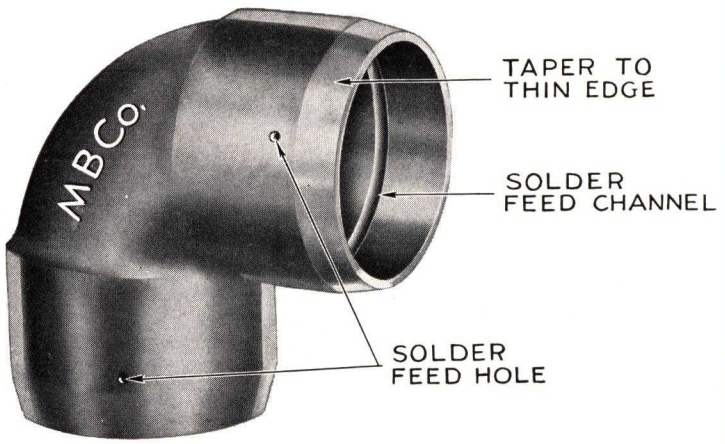
Complete control from virgin metal to finished product, including extensive engineering and laboratory facilities, is an outstanding feature in this organization. No new product is ever put upon the market without having successfully passed tests far beyond those which it would ever be called upon to withstand.

Mechanical Features of the STREAMLINE Fitting

The STREAMLINE Solder Fitting is the outstanding revolutionary advance of the age to the development of plumbing and heating. The STREAMLINE Fitting also assures an absolutely tight connection for industrial uses, in electric refrigeration work, gas, oil, air and vacuum lines, or for the handling of liquids of low specific gravity, such as gasoline, butane, etc., which readily seep through threaded connections. It is a fitting made for the experienced plumber or steamfitter and requires a mechanic's skill and tools to connect.

The STREAMLINE Solder Fitting is a radical departure from any method heretofore used in that it is not connected by threading or flaring but by soldering. This operation is performed by feeding wire or stick solder through a feed hole in the fitting after STREAMLINE copper pipe has been assembled in it, and sufficient heat applied with the blow-torch.

The liquefied solder is carried around the entire surface between the pipe and fitting by capillary attraction, and becomes immediately visible as a bright line at the outer edge between the pipe and fitting, thus affording unfailing visual evidence that a leakproof, bonded joint has been completed. **No previous tinning whatever is necessary.**



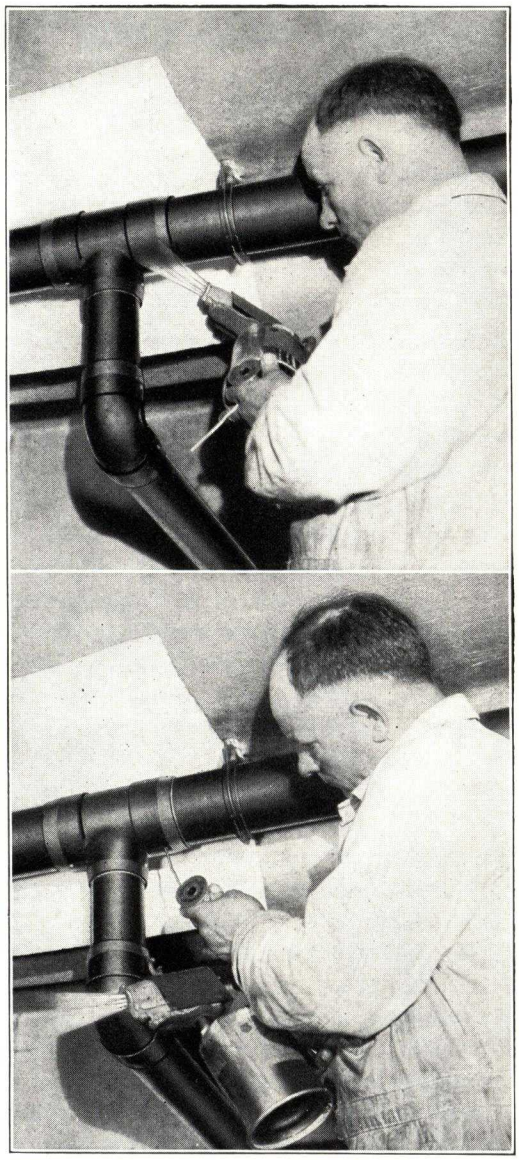
STREAMLINE Fittings are manufactured under one or more of the following United States patent numbers: 1,770,852; 1,776,502; 1,783,088; 1,801,171; 1,866,857; 1,870,651; 1,881,943; 1,890,998; 1,895,426; 1,916,989; 1,918,715; 1,921,584; 1,931,666; 1,933,915; 1,938,194; 1,963,421; 1,964,474.

There are several distinct mechanical features utilized in the construction of STREAMLINE Fittings. The machined openings in the fittings as well as the diameter of the STREAMLINE copper pipe are held to very close tolerances so that when the pipe is assembled in the fitting, it fits snugly.

The distance to which the pipe may be inserted in the fitting is made positive by a shoulder in the fitting itself against which the pipe rests. This shoulder is approximately the same height as the thickness of the pipe wall, thus insuring a continuous uninterrupted waterway, and reducing flow resistance to a minimum. **All STREAMLINE Solder Fittings are furnished with the solder feed hole drilled.** The solder feed hole is located immediately above solder feed channel.

The tapered ends of the fitting hasten the cooling of the solder at this point and form a solder gate.

A joint made with STREAMLINE Solder Fittings to STREAMLINE Copper Pipe is, in contrast to all other methods of connection, actually much stronger than the pipe itself.



Making a Connection with STREAMLINE Fitting to Copper Pipe

The Phenomenon of Capillary Attraction

The phenomenon of capillary attraction is utilized in making a connection with STREAMLINE Solder Fittings and Copper Pipe. Capillary attraction is that property which liquids possess of rising or being drawn up above their normal levels through close fitting surfaces or capillary channels.

The harnessing or utilizing of this natural law is one of the basic principles on which the STREAMLINE Fitting is constructed and upon which it depends for success. The successful functioning of this natural law in making connections with STREAMLINE Solder Fittings and Copper Pipe depends upon close tolerances and clean, fluxed surfaces. STREAMLINE Fittings are designed for, and are most successfully used with STREAMLINE Copper Pipe.

Note This Particular Feature

It does not make the slightest difference where the solder feed hole is located when making a connection. Many operators who are not thoroughly familiar with installing this material erroneously conclude that the solder feed hole must be located at the top. This naturally leads to some doubt in their minds as to how the solder could be fed in if they were working against a partition or ceiling on which the feed hole, owing to the position of the fitting in the line was located at the bottom or side. As a matter of fact, the solder will feed just as readily from these positions as from the top. Owing to the never failing phenomena of capillarity, the solder will flow up, down or laterally with equal facility, and the operator can just as readily make a perfect joint by applying the solder through the feed hole located at the bottom or side as he can if it is located at the top.

Strength of Patented Joint

Sectional View of the Joint

Photomicrographs and innumerable tests have conclusively proved that a joint made with STREAMLINE Copper Pipe and Fittings is actually a perfect bond of pipe, solder and fitting. This patented joint is of such amazing strength that if two ¾-in. sections of pipe are connected with a ¾-in. coupling and pulled in the Olsen testing machine, it requires the enormous pull of approximately nine thousand pounds to fracture the pipe while the joint remains invariably intact without the slightest sign of damage of any kind. In other words, the joint is very much stronger than the pipe itself. The pipe used in these tests was Extra Heavy .065 wall thickness.

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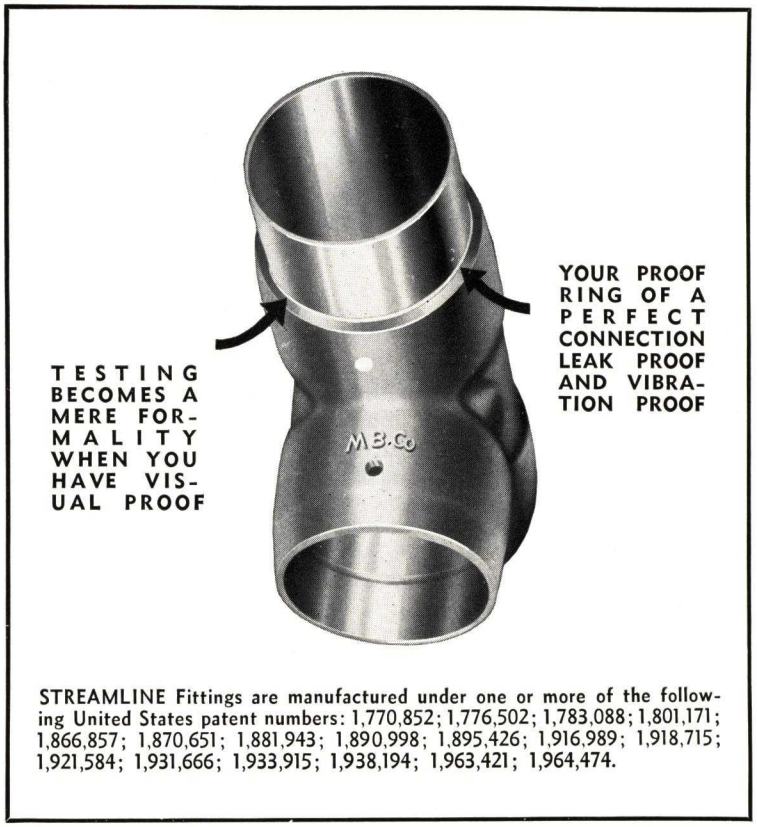
PORT HURON, MICHIGAN

Assurance of a Leak-Proof Connection by Visual Inspection Is an Exclusive Feature of the Patented Joint

After a STREAMLINE Solder Fitting and copper pipe have been cleaned, fluxed, assembled, and heated to the proper temperature with the blow torch, the solder is introduced through the feed hole in the fitting. The feed hole, as you will note, is located immediately above the feed channel at a point equidistant from the internal shoulder against which the pipe rests and the outer edge of the fitting.



STREAMLINE Fittings are manufactured under one or more of the following United States patent numbers: 1,770,852; 1,776,502; 1,783,088; 1,801,171; 1,866,857; 1,870,651; 1,881,943; 1,890,998; 1,895,426; 1,916,989; 1,918,715; 1,921,584; 1,931,666; 1,933,915; 1,938,194; 1,963,421; 1,964,474.

Feed the solder through the feed hole only. In no other way can you be absolutely sure by visual inspection that a perfect leak-proof bond has been accomplished. This is a feature which no other connection possesses

The never failing phenomenon of capillary attraction distributes the solder outward and inward over the entire area between pipe and fitting. The first indication that this solder film has bonded these two surfaces is the appearance of a ring of tiny dark green bubbles around the pipe at its junction with the fitting. This is the hot flux, which is being forced out of the space between the pipe and fitting by the outward flow of the solder. When these bubbles are wiped off, a continuous bright ring of solder is visible at the end of the fitting. (See illustration.)

This is a visual and never failing proof that a tight and perfect joint has been made. Expansion will not work it loose, vibration cannot make it leak.

Never, under any circumstances, should the solder be fed from the outer edge of the fitting, but invariably through the feed hole only. The important point to remember is that the solder is fed **into** a STREAMLINE Solder Fitting and must flow outwards evenly, consequently its appearance in a continuous ring at the end of the fitting is a positive indication of thorough bonding—attempts to feed from the end are, at the best, merely guesswork, because there is no evidence whatever, visual or otherwise, without an actual pressure test, that a leak-proof joint has been completed, and even the test does not prove that there is a thorough distribution of solder.

If the solder is fed from the end of the fitting, practically all the operator can do is to hope that it has been evenly distributed. It may go thoroughly in on one side and not fill up the other, or it may even make a continuous ring around the fitting, while the whole area back of the ring is not soldered.

The STREAMLINE Solder Fitting is the only fitting on the market which has the valuable visual inspection feature, and assurance of a perfect leak-proof connection.

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How to Make Joints

1. Cut pipe square with fine hack saw (use 32 tooth saw preferably). Remove burr.

2. USING SANDCLOTH, SANDPAPER, or STEEL WOOL, thoroughly clean outside end of copper pipe equal to depth of fitting. Leave no dark spots.

3. USING SANDCLOTH, SANDPAPER, or STEEL WOOL, thoroughly clean inside of fitting where pipe is to be inserted. Use scraper, if necessary, for cleaning groove or feed hole.

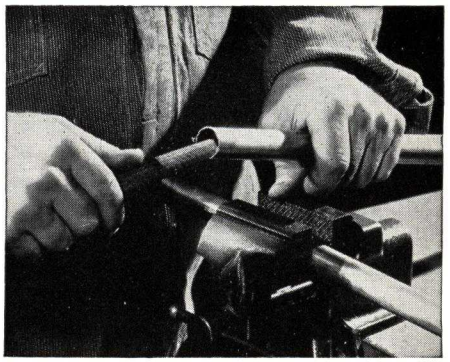
4. Apply a coat of STREAMLINE Soldering flux to outside of pipe and inside of fitting. Be sure that the flux is distributed evenly. Make certain that there is plenty of flux in the feed hole also. In extremely cold weather warm fitting slightly with torch to approximate room temperature (70 to 80 degrees).

5. Slip pipe into fitting until it will go no farther and turn back and forth once or twice to further insure an equal distribution of the flux.

6. Use only STREAMLINE Special Solders as they are expressly prepared for this work.

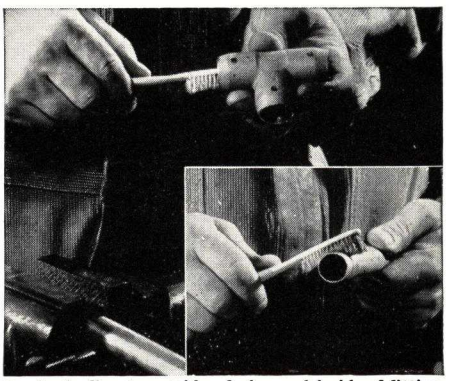
7. Using a blow torch or gas tip, melt a drop of solder into the solder feed hole. Apply heat around fitting until drop of solder disappears, indicating that the proper temperature has been reached. Where feed hole is located at side or bottom, the proper temperature may be ascertained by touching the heated fitting with the end of the solder wire, (preferably in the feed hole)—when solder melts upon contact, the proper temperature for soldering has been reached. **Feed solder through feed hole ONLY until it appears around the end of the fitting for the full pipe circumference.** Now remove the flame and a second or two later, as the connection starts to cool, completely fill feed hole with solder and remove surplus with a small piece of cloth. Bonding the surfaces and filling the hole should be done completely in ONE HEATING OPERATION. A little experience soon enables the operator to make perfect solder joints.

8. It is advisable on sizes larger than 1 ¼" to move the fitting on the pipe or tap with hammer when the solder starts in, thus breaking the surface tension and insuring equal distribution. When making connections with larger sizes of STREAMLINE fittings (3" to 10" inclusive), the procedure for soldering although fundamentally the same as given here for the smaller sizes, is best performed with a knowledge of certain tips and instructions that facilitate the work. A complete set of instructions for the larger sizes will be furnished upon request.

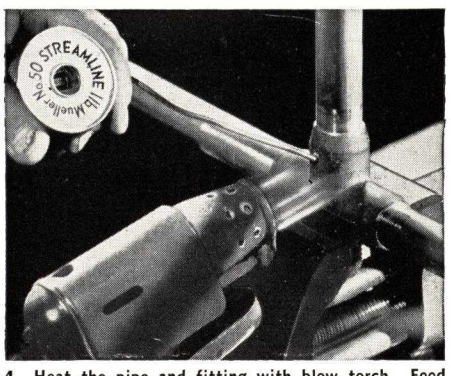


1 Cut pipe to length and remove burr with a file or scraper.

2 Clean outside of pipe and inside of fitting with sandpaper or sandcloth.



3 Apply flux to outside of pipe and inside of fitting.



4 Heat the pipe and fitting with blow torch. Feed solder through hole only. When solder shows at end of fitting remove heat and fill hole.

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PORT HURON, MICHIGAN

CLASSIFICATION OF STREAMLINE COPPER PIPE (HARD)

TYPE O—Hard STREAMLINE Copper Pipe may be used for water lines for non-shock pressures not over 125 lbs. This is largely used in pulp and paper mills.

TYPE M—(Federal Specification WW-T-799 and A.S.T.M. B 88-33) ; principal use is for plumbing. Also largely used for gas services, compressed air, low pressure steam, hot water heating lines and for water piping for non-shock pressures not over 200 lbs. Large sizes used for paper mill, brewery, distillery, and other industrial piping.

TYPE L—(Federal Specification WW-T-799 and A.S.T.M. B 88-33) ; principal use is for plumbing. Also used for gas services, hot water and low pressure steam and return lines, compressed air and industrial piping and water piping with non-shock pressures not over 250 lbs. Steam piping at pressures not over 65 lbs. or 310° F. This temperature limit is imposed by the solder used with the fitting.

TYPE K—(Federal Specification WW-T-799 and A.S.T.M. B 88-33). This is used for all purposes when higher than usual pressures are to be carried and for hot water piping where water conditions demand unusual corrosion resistance.

It may be used for non-shock water pressures not over 400 lbs. and for steam not over 65 lbs. or 310° F. This temperature limit is imposed by the solder.

Note—Hard pipe is not primarily intended for bending (see below for soft classification). It is for use with STREAMLINE Solder Fittings and shipped in straight lengths of 20 feet.

CLASSIFICATION OF STREAMLINE COPPER PIPE (SOFT)

TYPE L—Soft STREAMLINE Copper Pipe is recommended for work requiring bends, flares, concealed replacements and repairs, hot and cold water, compressed air and vacuum lines, for working pressures up to 150 pounds and on steam (saturated) up to 65 pounds gauge, or 310° F. (See below for Steam Applications.)

Note—See TYPE K Soft STREAMLINE Copper Pipe for Government Specifications and for underground use.

TYPE K (Federal Specification WW-T-799 and A.S.T.M. B 88-33) ; recommended for underground use and work requiring bends, flares, concealed replacements and repairs, hot and cold water, compressed air and vacuum lines for working pressures up to 250 pounds, and on steam (saturated) up to 65 pounds gauge, or 310° F. (See below for Steam Applications.)

Note—Soft pipe can be bent without annealing. It is for use with STREAMLINE Fittings and is shipped crated in coils of 30 to 60 ft. lengths up to and including 1 inch nominal pipe size, or in straight lengths of 20 feet in all sizes.

The larger the size the more difficult it is to make satisfactory bends without proper equipment.

When installing this pipe it is advisable to use the STREAMLINE Sizing Tools, which are furnished in sizes up to 2 inches inclusive.

STEAM APPLICATIONS—IMPORTANT!

Pressure allowed for steam is less than that allowed for air, water, etc., because the temperature of the pipe must not exceed the safe working temperature of the solder used to connect the fitting.

In a steam installation (where temperature increases with pressure) the successful application of STREAMLINE Copper Pipe and Fittings depends upon the solder used to make the connections as well as upon the thickness of the pipe.

For steam pressures up to 15 pounds use No. 50 STREAMLINE Solder and No. 50 STREAMLINE Flux.

For steam pressures from 16 pounds to 65 pounds, use either No. 95 or No. 104 STREAMLINE Solder and No. 50 STREAMLINE Flux.

For steam pressures in excess of 65 pounds, write home office—STREAMLINE PIPE AND FITTINGS DIVISION, Mueller Brass Co., Port Huron, Michigan.

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MUELLER BRASS CO.
PORT HURON, MICHIGAN

General Properties of STREAMLINE Copper Pipe

CLASSIFICATION	Nominal pipe size	Outside diam.	Stubbs gauge	Decimal equiv. of wall thickness	Actual inside diam.	Actual net copper area sq. in.	Weight per foot, lbs.	O.D. tolerance
TYPE "O" HARD 125 Lbs. Max. Working Pressure	3	3 1/8	18	.049	3.027	.4735	1.834	3.125 + .002 — .001
	4	4 1/8	17	.058	4.009	.741	2.87	4.125 + .002 — .002
	5	5 1/8	16	.065	4.995	1.034	4.00	5.125 + .002 — .002
	6	6 1/8	15	.072	5.981	1.370	5.31	6.125 + .002 — .002
	8	8 1/8	14	.083	7.959	2.097	8.12	8.125 + .002 — .002
	10	10 1/8	12	.109	9.907	3.431	13.28	10.125 + .002 — .002
	12	12 1/8	10	.134	11.857	5.06	19.55	12.125 + .002 — .002
Govt. Type "M" HARD 250 Lbs. Working Pressure	1/4	3/8	23	.025	.325	.0275	.106	.500 + .001 — .0005
	3/8	1/2	23	.025	.450	.0373	.144	.500 + .001 — .0005
	1/2	5/8	22	.028	.569	.0526	.203	.625 + .001 — .0005
	3/4	7/8	21	.032	.811	.0848	.328	.875 + .001 — .0005
	1	1 1/8	20	.035	1.055	.1199	.464	1.125 + .0015 — .0005
	1 1/4	1 3/8	19	.042	1.291	.1759	.681	1.375 + .0015 — .0005
	1 1/2	1 5/8	18	.049	1.527	.2429	.94	1.625 + .002 — .000
	2	2 1/8	17	.058	2.009	.3766	1.46	2.125 + .002 — .000
	2 1/2	2 5/8	16	.065	2.495	.5229	2.03	2.625 + .002 — .001
	3	3 1/8	15	.072	2.981	.6909	2.68	3.125 + .002 — .001
	3 1/2	3 5/8	14	.083	3.459	.924	3.58	3.625 + .002 — .002
	4	4 1/8	13	.095	3.935	1.204	4.66	4.125 + .002 — .002
	5	5 1/8	12	.109	4.907	1.719	6.66	5.125 + .002 — .002
	6	6 1/8		.122	5.881	2.305	8.91	6.125 + .002 — .002
	8	8 1/8		.170	7.785	4.249	16.46	8.125 + .002 — .002
	*10	10 1/8		.212	9.701	6.603	25.57	10.125 + .002 — .002
	*12	12 1/8		.254	11.617	9.88	36.69	12.125 + .002 — .002
Govt. Type "L" HARD 250 Lbs. Working Pressure	3/8	1/2		.035	.430	.0511	.198	.500 + .001 — .0005
	1/2	5/8		.040	.545	.0736	.285	.625 + .001 — .0005
	5/8	3/4	19	.042	.666	.0934	.362	.750 + .001 — .0005
	3/4	7/8		.045	.785	.1173	.455	.875 + .0015 — .0005
	1	1 1/8		.050	1.025	.1689	.655	1.125 + .0015 — .0005
	1 1/4	1 3/8		.055	1.265	.2281	.884	1.375 + .002 — .000
	1 1/2	1 5/8		.060	1.505	.2949	1.14	1.625 + .002 — .000
	2	2 1/8		.070	1.985	.4519	1.75	2.125 + .002 — .001
	2 1/2	2 5/8		.080	2.465	.6399	2.48	2.625 + .002 — .001
	3	3 1/8		.090	2.945	.8582	3.33	3.125 + .002 — .002
	3 1/2	3 5/8		.100	3.425	1.108	4.29	3.625 + .002 — .002
	4	4 1/8		.110	3.905	1.394	5.38	4.125 + .002 — .002
	5	5 1/8		.125	4.875	1.964	7.61	5.125 + .002 — .002
	6	6 1/8		.140	5.845	2.635	10.20	6.125 + .002 — .002
	8	8 1/8		.200	7.725	4.98	19.29	8.125 + .002 — .002
	10	10 1/8		.250	9.625	7.74	30.04	10.125 + .002 — .002
	12	12 1/8		.280	11.565	10.40	40.36	12.125 + .001 — .0005
Govt. Type "K" HARD 400 Lbs. Working Pressure	1/4	3/8	21	.032	.311	.0345	.133	.375 + .001 — .0005
	3/8	1/2	18	.049	.402	.0694	.269	.500 + .001 — .0005
	1/2	5/8	18	049	.527	.0887	.344	.625 + .001 — .0005
	5/8	3/4	18	.049	.652	.1079	.418	.750 + .001 — .0005
	3/4	7/8	16	.065	.745	.1654	.641	.875 + .0015 — .0005
	1	1 1/8	16	.065	.995	.2165	.839	1.125 + .0015 — .0005
	1 1/4	1 3/8	16	.065	1.245	.2679	1.04	1.375 + .002 — .000
	1 1/2	1 5/8	15	.072	1.481	.3519	1.36	1.625 + .002 — .000
	2	2 1/8	14	.083	1.959	.5326	2.06	2.125 + .002 — .001
	2 1/2	2 5/8	13	.095	2.435	.7559	2.92	2.625 + .002 — .001
	3	3 1/8	12	.109	2.907	1.033	4.00	3.125 + .002 — .002
	3 1/2	3 5/8	11	.120	3.385	1.322	5.12	3.625 + .002 — .002
	4	4 1/8	10	.134	3.857	1.684	6.51	4.125 + .002 — .002
	5	5 1/8		.160	4.805	2.499	9.67	5.125 + .002 — .002
	6	6 1/8		.192	5.741	3.585	13.87	6.125 + .002 — .002
	* 8	8 1/8		.271	7.583	6.689	25.90	8.125 + .002 — .002
	*10	10 1/8		.338	9.449	10.396	40.26	10.125 + .002 — .002
	*12	12 1/8		.405	11.315	14.92	57.76	12.125 + .001 — .0005

(*) All items prefixed with an asterisk are not carried in stock but are made only to order.

STREAMLINE
PIPE AND FITTINGS DIVISION
MUELLER BRASS CO.
PORT HURON, MICHIGAN

General Properties of STREAMLINE Copper Pipe

CLASSIFICATION	Nominal pipe size	Outside diam.	Stubbs gauge	Decimal equiv. of wall thickness	Actual inside diam.	Actual net copper area sq. in.	Weight per foot, lbs.	O.D. tolerance
TYPE "L"	3/8	1/2		.035	.430	.0511	.198	.500 + .001 — .0005
	1/2	5/8		.040	.545	.0736	.284	.625 + .001 — .0005
SOFT	3/4	7/8		.045	.785	.1173	.454	.875 + .001 — .0005
	1	1 1/8		.050	1.025	.1689	.653	1.125 + .0015 — .0005
	1 1/4	1 3/8		.055	1.265	.2281	.882	1.375 + .0015 — .0005
	1 1/2	1 5/8		.060	1.505	.2949	1.14	1.625 + .002 — .000
150 Lbs. Working Pressure	2	2 1/8		.070	1.985	.4519	1.75	2.125 + .002 — .000
	2 1/2	2 5/8		.080	2.465	.6399	2.48	2.625 + .002 — .001
	3	3 1/8		.090	2.945	.8582	3.33	3.125 + .002 — .001
	3 1/2	3 5/8		.100	3.425	1.108	4.29	3.625 + .002 — .002
	4	4 1/8		.110	3.905	1.394	5.38	4.125 + .002 — .002
	5	5 1/8		.125	4.875	1.964	7.61	5.125 + .002 — .002
	6	6 1/8		.140	5.845	2.635	10.20	6.125 + .002 — .002
Govt. Type "K"	1/4	3/8	21	.032	.311	.0345	.133	
	3/8	1/2	18	.049	.402	.0694	.269	.500 + .001 — .0005
	1/2	5/8	18	.049	.527	.0887	.344	.625 + .001 — .0005
SOFT	3/4	7/8	16	.065	.745	.1654	.641	.875 + .001 — .0005
	1	1 1/8	16	.065	.995	.2165	.839	1.125 + .0015 — .0005
	1 1/4	1 3/8	16	.065	1.245	.2679	1.04	1.375 + .0015 — .0005
	1 1/2	1 5/8	15	.072	1.481	.3519	1.36	1.625 + .002 — .000
	2	2 1/8	14	.083	1.959	.5326	2.06	2.125 + .002 — .000
	2 1/2	2 5/8	13	.095	2.435	.7559	2.92	2.625 + .002 — .001
250 Lbs. Working Pressure	3	3 1/8	12	.109	2.907	1.033	4.00	3.125 + .002 — .001
	3 1/2	3 5/8	11	.120	3.385	1.322	5.12	3.625 + .002 — .002
	4	4 1/8	10	.134	3.857	1.684	6.51	4.125 + .002 — .002
	5	5 1/8		.160	4.805	2.499	9.67	5.125 + .002 — .002
	6	6 1/8		.192	5.741	3.585	13.87	6.125 + .002 — .002
	* 8	8 1/8		.271	7.583	6.689	25.90	8.125 + .002 — .002
	*10	10 1/8		.338	9.449	10.396	40.26	10.125 + .002 — .002
	*12	12 1/8		.405	11.315	14.92	57.76	12.125 + .002 — .002

(*) All items prefixed with an asterisk are not carried in stock but are made only to order.

STREAMLINE Solders and Fluxes

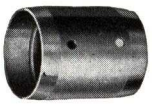
Choice of Solder Depends Upon Working Temperatures, Not Working Pressures
How Hot Does Pipe Line Get in Service?

WORKING TEMPERATURE	Solder	Flux	Melting Range	Recommended Uses		Procedure for Making Joints
				Regular Fittings	Fittings with Locking Wire Joints	
Not over 250° F.	No. 50	No. 50	358°-414° F.	Plumbing, Drainage, Industrial Piping and Steam not over 15 lbs. pressure	Steam up to 50 lbs. (297° F.) Type "L" or "K" Hard Pipe	Refer to page 4
Not over 312° F.	No. 95 No. 104	No. 50	450°-460° F. 460° F.	Refrigeration and Air Conditioning Steam up to 65 lbs.	Steam up to 125 lbs. (353° F.) Type "L" or "K" Hard Pipe	Refer to page 4
Not over 387° F.	No. 114	No. 50	625°-740° F.	Steam up to 200 lbs. Type "K" Pipe **not over** 2 in. in size	Steam up to 250 lbs. (403° F.) Type "K" Hard Pipe	Heat joint evenly to at least 800°—Test temperature by applying solder to outside of fitting which should be hot enough to make solder flow readily—Do not apply flame direct to solder as oxidation will occur
Not over 475° F.	Phos. Copper or No. 122	Borax Water Paste or Fluxine	1300° F. 1250° F.	Steam up to 250 lbs. (403° F.) Refer all inquiries to office at Port Huron		Use Oxy-Acetylene Torch
Over 475° F.				**Do not use copper**		

STREAMLINE
PIPE AND FITTINGS DIVISION
MUELLER BRASS CO.
PORT HURON, MICHIGAN

STREAMLINE SOLDER FITTINGS

90° Elbow
Copper to Copper



Coupling
Copper to Copper

Coupling
Copper to Outside I. P. S.

90° Elbow
Copper to Outside I. P. S.

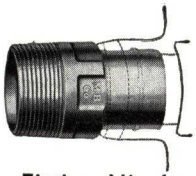
Coupling
Copper to Inside I. P. S.

Range Boiler Coupling

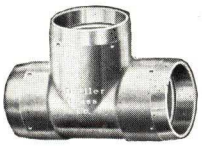
90° Elbow
Copper to Inside I.P.S.

45° Elbow
Copper to Copper

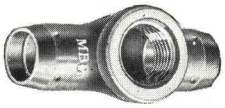
Range Boiler Elbow



Fitting Nipple
Fitting to Outside I. P. S.



Tee
Copper to Copper to Copper



Tee
Copper to Copper to Inside I. P. S.

Cross
Copper to Copper

Fitting Coupling
Fitting to Inside I. P. S.

90° Street Elbow
Fitting to Copper

45° Street Elbow
Fitting to Copper

Bushing
Fitting to Copper

Plug

Cap

Eccentric Coupling
Copper to Copper

Drop Ear Elbow
Copper to Copper to Inside I.P.S.

Drop Ear Elbow
Copper to Copper

Drop Ear Tee
Copper to Inside I. P. S.

Drop Ear Tee
Copper to Copper to Copper

We manufacture a complete line of FORGED brass STREAMLINE Fittings for mechanical refrigeration and air conditioning applications.

Note: With few exceptions, or where existing demand does not require them, STREAMLINE Solder Fittings are furnished in full range from ¼ in. to 8 in. inclusive. Our Catalog with complete detailed information on Streamline Copper Pipe and Fittings is available upon request.

STREAMLINE
PIPE AND FITTINGS DIVISION
MUELLER BRASS CO.
PORT HURON, MICHIGAN

OUTSTANDING ADVANTAGES
of STREAMLINE Copper Pipe and STREAMLINE Solder Fittings

Elimination of Threaded Connections

Piping Systems commonly used in the past for plumbing and heating have required labor consuming threaded connections. The STREAMLINE Copper Pipe and Fittings are the first practical solution of a permanently tight, easily made soldered connection. By the elimination of the cut thread the strength of the tube or pipe is not reduced at the connections—the STREAMLINE Fitting and the completely soldered connection actually increase the strength.

Permanence

Made of 99.90 per cent pure copper, STREAMLINE Copper Pipe is permanently non-corroding except under extremely unfavorable conditions seldom encountered. It is hard drawn and is shipped in 20-ft. straight lengths. Being hard drawn it retains its fine straight appearance and when installed there are no kinks, ripples or bends.

It requires no more hangers or supports than an ordinary iron installation—it actually weighs less.

With soft copper pipe there is always the danger of driving nails through it during the process of lathing, etc. With STREAMLINE Hard Copper Pipe (Types K, L, and M) tests conclusively show that its hard surface readily deflects nail points.

Installations of materials that rust away and corrode will, at best, last but a few years depending upon the nature of the soil or water and will then have to be replaced. In many cases corrosion and rust will start almost immediately, gradually decreasing their service and cutting down the flow capacity. At the end of a few years they have no salvage value. An installation of STREAMLINE Copper Pipe and STREAMLINE Solder Fittings will continue to give uninterrupted permanent capacity service.

Conservation of Space in Construction

Space saving is of major importance to both architect and owner. STREAMLINE Copper Pipe and Fittings require approximately 30 per cent less space than other materials—no room is required for wrench grip or swing necessitated by screwed fittings. A STREAMLINE Solder Fitting, although enormously strong, is little larger than the pipe itself. An installation of STREAMLINE Copper Pipe and Fittings can be placed close to walls, partitions or ceilings, and thus decreases space for vertical pipe shafts and horizontal pipe spaces.

Absence of Noise in STREAMLINE Installations

The smooth interior of the STREAMLINE Pipe and the absence of turmoil at the recessed fittings make for extreme quietness when water is running through it. This quality of silence is greatly desirable in residences, and particularly in apartment and hotel buildings where the noise created by water traveling through most piping systems is a source of considerable annoyance to people in adjoining rooms.

For Repair and Replacement Work

An installation of STREAMLINE Copper Pipe and Fittings cannot rust. They are ideal for replacement work and last a lifetime without further attention.

The cost of STREAMLINE Copper Pipe and Fittings is approximately the same as iron but costs very much less than iron in repair jobs, owing to the fact that it is not necessary to tear up large areas of wall and flooring to make a replacement. The removal of a base or floor board is generally all that is necessary.

TYPE L and **TYPE K** STREAMLINE Copper Pipe is pliable enough to be easily bent and worked around projections. It may be readily run between studding, over or under electric conduits, by manipulating and bending the pipe in almost the same way as an electrician installs an electric cable. A STREAMLINE installation requires less room than any other material for the same purpose. A joint made with STREAMLINE Solder Fittings and Copper Pipe is the strongest part of the installation. There is no danger of future leakage at these points.

STREAMLINE Copper Pipe is provided in both hard and soft tempers and either or both may be used to advantage. **TYPES O, M, L** and **K,** hard temper STREAMLINE Copper Pipe are particularly suitable on some of the larger jobs where utility corridors or large partition areas are available. In these cases, straight length runs are easily handled and the compactness of the STREAMLINE Fitting, which is very slightly larger than the pipe itself, makes an exceptionally handsome job.

TESTS

Expansion and Contraction—Sections of ¾-in. STREAMLINE Copper Pipe were connected with STREAMLINE couplings making a total length of 36 ft. containing 14 joints. Cold water was run through the Pipe for 15 seconds alternated with 100 lb. of steam at 339° F. This alternating test of steam and cold water was run continuously until 20,160 complete cycles had been effected. After a thorough inspection there was not the slightest sign of any damage or leak in the connection. This test was a very severe one and in view of the results obtained should satisfactorily answer any questions as to its dependability under service conditions.

Vibration—A test to determine the effect of continued vibration on connections made with STREAMLINE solder fittings to STREAMLINE Copper Pipe was conducted as follows:

The test was run on a 10-ft. length of ¾-in. vertical pipe which contained nine joints; the lower end was held rigid. The upper end of the pipe was attached to a vibrator. The vibrator was set in motion and run continuously day and night for one week. The pipe was subjected to 850 vibrations per minute, totaling 8,568,000 vibrations over the test period with not the slightest sign of failure.

TESTS

Tensile Strength—Two pieces of ¾-in. iron pipe were screwed into a coupling and pulled on the Olsen testing machine. Repeated experiments showed that the threads fractured at about 6,400 lbs.

Extra-heavy STREAMLINE Copper Pipe soldered into STREAMLINE couplings and subjected to the same test resulted in a fracture of the pipe itself at slightly over 9,000 lbs. but showed not the slightest sign of joint failure.

Deflection or Bending—Two pieces of ¾-in. iron pipe size brass pipe 6 in. long were screwed into a coupling and placed over supports 5⅜ in. center to center. A deflection test showed that the thread failed at 1 1/16 in. from horizontal.

The same test was carried out on two 6-in. pieces of Standard and Extra-Heavy STREAMLINE Copper Pipe and after being bent to a 45° angle the joint was still intact.

Heat Loss from Wrought Iron or Steel Pipe Is Approximately Twice That from STREAMLINE Copper Pipe

A STREAMLINE Copper Pipe and Solder Fittings installation emits very little heat by radiation and in hot water lines, steam lines, etc., can be very often advantageously installed **without insulation.**

There are two causes of heat loss from a pipe line, one is radiation and one is convection. Hard copper will have a radiation loss of about one-sixth that of black pipe but the loss by convection, which will be nearly alike on both, will bring the total heat loss from copper to less than half that of black pipe. This reduction frequently justifies the use of hard copper pipe without covering instead of covered steel pipe or wrought iron. This is particularly true where space is valuable, as it is in all large buildings. The smaller uncovered pipe not only takes little room but has a most handsome appearance. This question of covering must be considered on each job by itself. When a line is exposed to strong air currents or is over large outside doorways or places where convection loss would be high, it should be covered.

Not only many small jobs but many large ones, apartment houses, hotels and school buildings are installing heating systems with all copper lines and considering the saving by the use of smaller pipe sizes and saving of covering, their cost compares favorably with former practice.

Many contractors after completing a heating installation of STREAMLINE Copper Pipe and Fittings, polish the pipe and give it a light coat of thin lacquer. The preparatory cleaning is readily accomplished by the use of steel wool and gasoline. The lacquering keeps the pipe, in the majority of cases, permanently bright and lowers the heat emission.

Copper heating surfaces are widely used at present, especially in the form of finned tubes for convection heat transfer or as exemplified in the numerous convection types of exposed and concealed radiators. It is interesting to note that, without exception, when brass and copper surfaces are successfully used for heat transfer, the effective radiation area is necessarily greatly increased, as by the use of fins, and a current of air must be kept steadily moving over such surfaces; this current being provided either by power-driven fans or by natural convection or stack draft action such as may be effected by heated flues above the warm surfaces.

The users of concealed heaters built into the walls under the windows have learned the importance of the height of the heated flue. When air ceases to travel over the smooth surface of heated copper pipe, heat transfer ceases to a great extent.

Although copper pipe surfaces radiate very little heat, copper itself is a very rapid conductor of heat. Therefore it naturally follows that there is considerably less loss of heat when being conveyed from the point of generation to the points of distribution.

COST COMPARISONS

STREAMLINE Solder Fittings and Copper Pipe in certain installations may cost a little more than ordinary threaded iron pipe and fittings—but the possible extra cost is so little considering the trouble-free service it gives that it is relatively unimportant. For instance, in the average 6 to 8 room house costing from $5000 to $8000, the added cost of the STREAMLINE installation would range from about $15 to $30, depending, of course, on the extent of the plumbing and heating system.

This extra cost is probably less than ½ of 1% of the value of the house and for this the owner is getting lifetime trouble-free service. It is practically everlasting under ordinary conditions of soil and water. In a very few sections of the country where the water is acidulated owing to certain elements in the soil through which the water passes, it may attack the pipe but even under these conditions it will last a great deal longer than iron, which rusts under any condition. The first cost of installing STREAMLINE is the only cost.

A STREAMLINE Copper Pipe and Solder Fittings installation is, of course, much lower in cost than threaded brass or copper pipe, the wall of which must be a great deal thicker to accommodate the threading than is required in actual service.

STREAMLINE COPPER PIPE AND FITTINGS FOR PLUMBING, HEATING, AIR CONDITIONING, AND INDUSTRIAL USE

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*Branches marked * carry warehouse stocks in addition to the main plant at Port Huron, Michigan.

STREAMLINE
PIPE AND FITTINGS DIVISION
MUELLER BRASS CO.
PORT HURON, MICHIGAN

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BONNEY FORGE & TOOL WORKS

FORGED FITTINGS DIVISION

MAIN OFFICE

ALLENTOWN, PA.

STOCK FITTINGS FOR BRANCH PIPE CONNECTIONS BY WELDING

WeldOlets and ThredOlets are stock fittings for forming branch pipe connections of all kinds by welding. They eliminate direct pipe-to-pipe intersection welds which have never proved satisfactory. With the use of the WeldOlet or ThredOlet it is possible to obtain pipe junctions which are permanent, absolutely leakproof and which have full pipe strength.

The names "WeldOlets" and "ThredOlets" are Bonney trade-marks registered in the United States Patent Office. Full patent coverage has been granted in the United States and foreign countries.

All cutting and threading of main pipe lines is eliminated. Preliminary layouts of main pipe and branches are unnecessary. No templets are used. The fitting is simply welded in place on the main line at the proper point—the hole is cut *after* attaching the fitting. The branch line is then welded in place if a WeldOlet was used—if a ThredOlet was used, the branch is screwed in place.

The result is a neat, workmanlike job which, due to the funnel-shaped outlet of the fitting, reduces turbulence and friction to a minimum and provides free, unrestricted flow. Their heavy external rib compensates for loss of strength in the main pipe when the hole in cut and distortion is entirely eliminated.

Except in the very large sizes which are of cast steel, WeldOlets and ThredOlets are of drop-forged steel of the analysis most suitable for welding. Either oxy-acetylene or electric-arc welding may be used. They are also available in wrought iron, Toncan iron, Brass, Monel, Everdur and of other metals to meet every piping need.

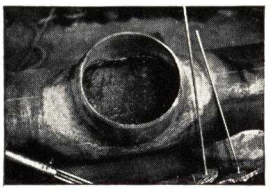
WeldOlets and ThredOlets are suitable for any type of building construction and are equally well adapted to new construction, remodeling and maintenance. Blueprints showing full dimensions, prices, etc. gladly furnished on request.

WeldOlets and ThredOlets are especially suitable for use as radiator take-offs, for header construction in heating systems, for spray heads in sprinkler systems, in high-pressure steam lines and, in fact wherever branch lines are to be taken off the main line.

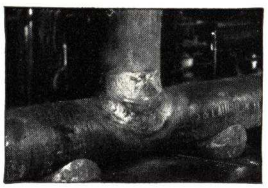
EASILY INSTALLED

WeldOlets and ThredOlets are easily installed. Simply select the position of the outlet, rub the fittings over the pipe several times to remove scale, mark center lines and tack the WeldOlet or ThredOlet into position.

The WeldOlet or ThredOlet is then welded into place either by the electric-arc or oxy-acetylene method. A junction of full pipe strength and an outlet that is leakproof is the result.



Where the outlet is 2 in. or larger it is recommended that the button be removed after the welding operation. On small sizes the fitting is used as a templet and the hole is cut in the main pipe first. A full inspection of the inside of the joint is possible by using these fittings, allowing removal of all scale, welding metal, etc.



The branch line is then welded into position using a simple vee weld. In the event that a ThredOlet is used the branch is threaded and screwed into place. The result is a junction of full pipe strength, absolutely leakproof with turbulence and friction reduced to a minimum.

STANDARD STOCK SIZES OF BONNEY WELDOLETS AND THREDOLETS

Pipe size, inches	Outlet sizes, inches														
	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12
¾		†¾x¾													
1	1x½	1x¾	1x1												
1¼	1¼x½	1¼x¾	1¼x1	1¼x1¼											
1½	1½x½	1½x¾	1½x1	1½x1¼	1½x1½										
2	2x½	2x¾	2x1	2x1¼	2x1½	2x2									
2½	2½x½	2½x¾	2½x1	2½x1¼	2½x1½	2½x2	2½x2½								
3	3x½	3x¾	3x1	3x1¼	3x1½	3x2	3x2½	3x3							
3½	3½x½	3½x¾	3½x1	3½x1¼	3½x1½	3½x2	3½x3½	3½x3	3½x3½						
4	4x½	4x¾	4x1	4x1¼	4x1½	4x2	4x2½	4x3	4x3½	4x4					
5	5x½	5x¾	5x1	5x1¼	5x1½	5x2	5x2½	5x3	5x3½	5x4	5x5				
6	6x½	6x¾	6x1	6x1¼	6x1½	6x2	6x2½	6x3	6x3½	6x4	6x5	6x6			
8	8x½	8x¾	8x1	8x1¼	8x1½	8x2	8x2½	8x3	8x3½	8x4	8x5	8x6	8x8*		
10	10x½	10x¾	10x1	10x1¼	10x1½	10x2	10x2½	10x3	10x3½	10x4	10x5	10x6	10x8*	10x10*	
12	12x½	12x¾	12x1	12x1¼	12x1½	12x2	12x2½	12x3	12x3½	12x4	12x5	12x6	12x8*	12x10*	12x12*

*These sizes made in WeldOlets only.
†This size made in ThredOlets only.

Larger sizes up to 24x24 in. available on special order.

WELDOLETS · THREDOLETS

177J

MEMORANDA

27
15

DURIRON

ACID-PROOF

EQUIPMENT

THE DURIRON COMPANY, Inc.

DAYTON • • • OHIO • • • U. S. A.

The DURIRON COMPANY, Inc.

General Offices and Plant: DAYTON OHIO

FACTORY BRANCH OFFICES

BOSTON, MASS., The Duriron Co., Inc., 80 Boylston Street
BUFFALO, N. Y., The Duriron Co., Inc., Jackson Building
CHICAGO, ILL., The Duriron Co., Inc., 310 So. Michigan Avenue
DETROIT, MICH., The Duriron Co., Inc., General Motors Building
NEW YORK, N. Y., The Duriron Co., Inc., 22 East 40th Street
PHILADELPHIA, PA., The Duriron Co., Inc., 1505 Race Street
PITTSBURGH, PA., The Duriron Co., Inc., Empire Building
ST. LOUIS, MO., The Duriron Co., Inc., Arcade Building, 8th and Olive

DIRECT SALES REPRESENTATIVES

ATLANTA, GA., Ray J. Welsh, P. O. Box 26
BIRMINGHAM, ALA., J. W. Eshelman, Martin Building
CLEVELAND, OHIO, R. L. Hanschke, 2029 Morrison, Lakewood
DALLAS, TEX., Joe P. Dillard, Construction Building
DENVER, COLO., F. H. Whiting Co., Exchange Building
DES MOINES, IOWA, C. E. Gibson, Masonic Temple
HOUSTON, TEX., Ayres Eng. Co., Petroleum Building
KANSAS CITY, MO., J. W. Pendergast, Jr., 700 W. 47th Street
LITTLE ROCK, ARK., E. L. Goldstein, P. O. Box 25
LOS ANGELES, CALIF., G. R. Oster, Hollingsworth Building
MIAMI, FLA., F. C. Jack, 206 N. E. 14th Street
MINNEAPOLIS, MINN., F. S. Gouldthrite, 923 Nicollet Avenue
NEW ORLEANS, LA., W. H. Grant, 824 Carondelet Street
OKLAHOMA CITY, OKLA., L. A. Wheaton, P. O. Box 411
RICHMOND, VA., M. R. Mills, Jr., 201 E. Franklin Street
ROCK HILL, S. C., Wm. H. Shepard, 1034 Park Avenue
SALT LAKE CITY, UTAH, H. L. Price, 228 So. West Temple
SAN FRANCISCO, CALIF., D. E. Jack, 244 9th Street
TACOMA, WASH., R. E. Chase & Co., Tacoma Bldg.
TULSA, OKLA., Edward Soph, Alexander Building
WASHINGTON, D. C., R. H. Stacy, 1673 Columbia Road
SAN JUAN, PORTO RICO, Carlos R. Rossi, Calle Tetuan No. 5

The services of The Duriron Company, specialists for 25 years in the handling of corrosive liquids and fumes, are oftentimes of great assistance to architects when they have corrosion problems. These services are freely offered and we shall be glad to make suggestions on any project involving the use or disposal of corrosive liquids.

PRODUCTS

Duriron Acid-Proof equipment is available for the chemical laboratories of schools, colleges, hospitals and similar institutions as follows:

- Drain Pipe and Fittings
- Exhaust Fans
- Sinks—hemispherical and flat rim
- Sink Strainers for Duriron, Alberene, stoneware and other acid-resisting sinks
- Overflows
- Floor Drains (double drainage type)
- Traps, regular and special designs for laboratory use
- Kettles, jacketed, for glassware cleaning solutions
- Kjeldahl Digestion Units (no hood required)

Durimet corrosion-resisting alloy steel sheet is available for fabricating fume ducts.

A wide variety of centrifugal pumps, both plain and self-priming, valves, flanged pipe and fittings and other equipment is available for sewage disposal plants, filtration plants, acid sumps and similar uses.

All equipment made by the Duriron Company is for the express purpose of handling corrosive liquids and fumes.

DURIRON *The Acid-proof Alloy*

DURIRON

Duriron is a high silicon iron alloy containing approximately 14.5% silicon. It is extremely resistant to nearly all kinds of corrosives and is practically proof against all acid wastes encountered in laboratories. Duriron is very hard, resists abrasion and scouring as well as corrosion. It is equally resistant throughout its structure, and is not dependent upon coating, lining or glazing. Duriron Acid-Proof Drain Pipe and Fittings can be expected to outlast the building in which they are installed.

Physical Characteristics

Weight, pounds per cu. in..... .255
Melting Point, degrees F.....2300
Thermal Conductivity (Ag-1) 0° C.....0.125
Tensile Strength (½" diameter bar)..16,000 lbs. sq. in.
Coefficient of expansion: (degrees F.) 32-212
.....0.00000360

Duriron is machinable only by grinding; it cannot be threaded. It can be welded by the oxyacetylene method: special instructions will be sent upon request.

Duriron is of great value where dirty and abrasive corrosive solutions are handled. The resistance to abrasion is especially desirable in laboratory piping where broken glass, solutions containing solids in suspension and similar matter are dumped into the sinks.

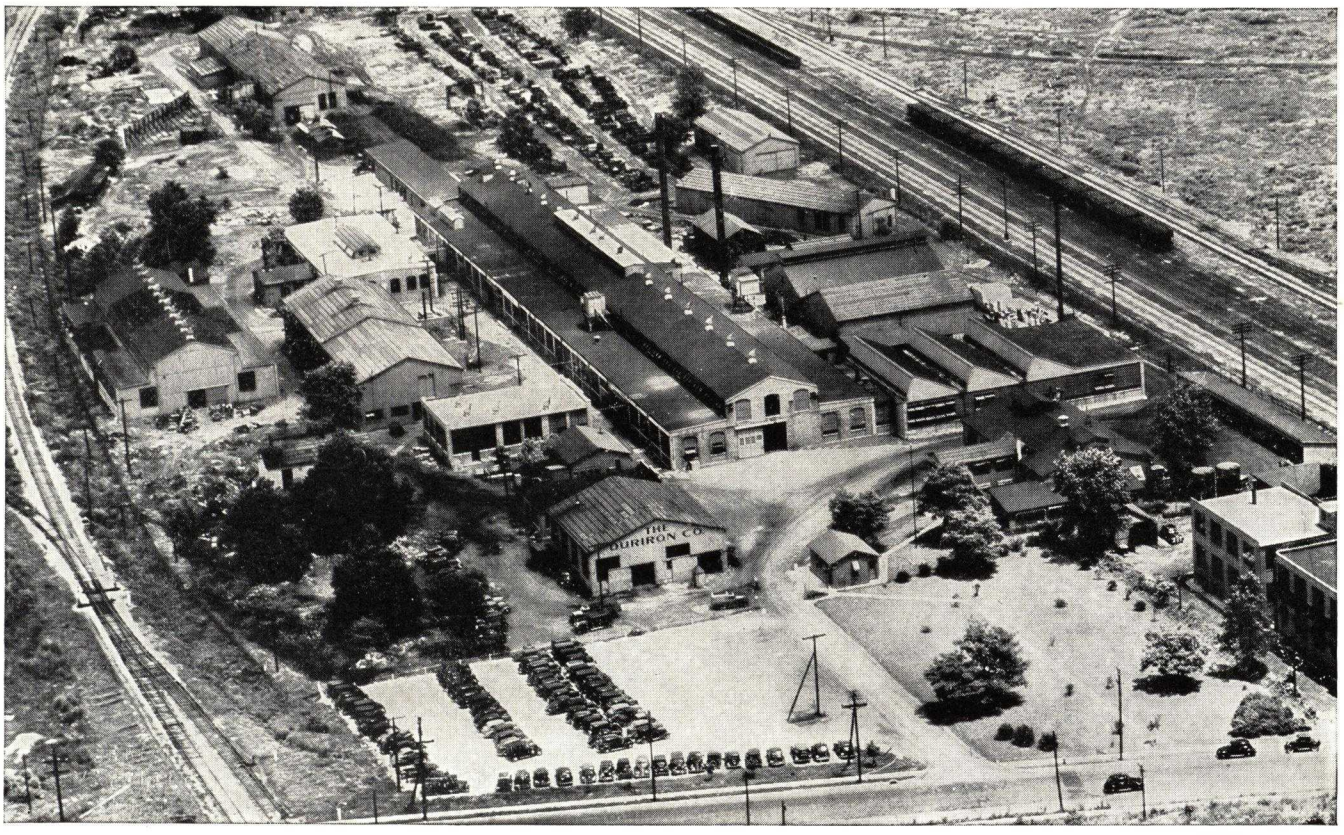
Chemical Characteristics

Duriron is practically unaffected by sulphuric, nitric, acetic, and most other commercial acids at any strength or temperature.

Duriron is not recommended for handling the following corrosives except as they are incidental wastes in laboratory drainage: bromine, fused alkalies, hydrofluoric acid, hydrofluosilicic acid when concentrated, sulphurous acid or strong, hot caustic solutions.

Chlorine and its compounds, such as hydrochloric acid and ferric chloride, have little effect on Duriron at room temperatures and low concentrations. For elevated temperatures and higher concentrations, we recommend DURICHLOR, another acid-resisting product of The Duriron Company.

World's Largest Exclusive Manufacturer of Corrosion-Resisting Alloys and Equipment



ADVANTAGES OF DURIRON

Duriron Acid-Proof Drain Pipe and Fittings are installed as easily and the same as extra heavy cast iron soil pipe. The working dimensions are the same and the work is familiar to plumbers.

Duriron pipe joints, properly calked, stay tight.

No protective coating is required inside or outside, nor is it necessary to encase the pipe in concrete. Lines may be concealed within the walls or ceiling without fear of leakage or discoloration.

Duriron Drain Pipe does not warp or sag from heat.

Duriron joints will not loosen under ordinary building vibration.

Duriron is not scoured by sharp solids, such as broken glassware, nor by sediment.

Duriron is not affected by mercury.

Solids do not cling to the walls of Duriron pipe.

Duriron pipe that has been in service can be used again if care is taken in making the removal.

THE INSTALLATION OF DURIRON

The labor cost of installing Duriron Acid-Proof Drain Pipe is the same as that of extra heavy cast iron soil pipe. The installation is identical except for the bell packing. Asbestos packing is used instead of hemp or oakum, which are not acid resistant. A support or hanger for each length of pipe is generally used, with a hanger provided for each bend.

The cost of using Duriron Pipe is about equal to that of less resistant material after one replacement. Where the walls or ceiling have had to be torn out to make the replacement, the cost of Duriron is less. In most instances, before replacement is made, there are numerous repair jobs. The cost of repairs added to the first cost, makes it cheaper to use Duriron Acid-Proof Drain Pipe and Fittings in the first place.

The freedom from repairs and replacements . . . the protection of walls and ceilings from the mars of repair work . . . the satisfaction to the architect and the owner in knowing that nothing better could be used, are the *Plus* values delivered with each Duriron Acid-Proof Drain Pipe installation.

PHYSICAL TESTS

The Testing Laboratories of Columbia University some years ago made an exhaustive series of tests, both chemical and physical, on vitrified tile, lead and Duriron pipe. Chemical tests show Duriron beyond comparison in universal acid resistance. Physical tests are summarized below:

COMPARATIVE PHYSICAL PROPERTIES DURIRON, LEAD AND VITRIFIED TILE PIPE

From Tests made by Testing Laboratories of Columbia University

	Vitrified Pipe	Lead Pipe	Duriron Pipe
Average ultimate crushing load, lbs. per ft.	1556	1492	13490
Average transverse ultimate load, lbs., center load, span 21 in.	1813	400	11250
Modulus of rupture, computed from crushing load, lbs. per sq. in.	1644	*	17200

*Impossible to compute for a plastic material such as lead.

TYPICAL SPECIFICATIONS

(1) **Pipe**—All pipe and fittings carrying acid waste from ..... to ..... shall be of Duriron as manufactured by THE DURIRON COMPANY, INC., Dayton, Ohio, of the sizes shown on drawings .....

(2) All such pipe and fittings shall be of bell and spigot type, extra heavy weight and dimensions, and shall fulfill the requirements of the city plumbing code of the City of .....

(3) **Joints**—All joints in lines carrying acid wastes shall be made by ramming tightly in bottom of bell one ring of pure asbestos wick packing, upon which shall be poured sufficient molten lead to fill the bell completely, the lead being properly caulked in the manner usual with cast iron soil pipe.

(4) **Cleanouts**—Suitable cleanout plugs shall be provided as shown on drawings.

(5) **Expansion Joints**—If lines are to handle wastes of high temperature, expansion joints shall be provided as shown on drawings.

(6) **Alignment**—All pipe lines shall be correctly aligned before joints are made. Proper supports shall be provided; at least one support to each length of pipe in horizontal lines, one at each bend, and supports at intervals no greater than 10 ft. in vertical lines.

(7) **Floor Drains**—Floor drains in ..... shall be of Duriron, double drainage type, Plate No. ....

(8) **Vents**—Vent lines carrying acid fumes shall be of Duriron as specified for pipe above. (Unless fumes are of extreme strength other materials may be used.)

(9) **Sinks**—All sinks in ..... shall be of Duriron, of the sizes and shapes as shown on detail drawings. Each sink shall bear the name "Duriron" cast thereon. Outlet fittings shall be of Duriron.

(10) **Sink Connections**—All connections from sinks to waste lines, including traps, shall be Duriron as specified.

(11) **Exhaust Fans**—All exhaust fans for exhausting acid fumes from hoods, together with all suction and discharge pipes connected therewith, shall be of Duriron or Durimet. Such fans shall be of the type, size and capacity as shown on drawings.

Important—It is important that the location of floor outlets follow exactly the specifications in laboratory installations.

If this is not done within close limits, the laboratory furniture can not be properly located. Inaccurate location of floor openings by the plumbing contractor offers an excuse to the furniture contractor to substitute an inferior material to offset the extra fitting work made necessary by this deviation.

DURIRON EXHAUST FANS

For the ventilation of laboratory hoods, pickling rooms and in processes involving fumes, the exhaust fan should not be affected by the gases handled. Duriron, being nearly universally acid resistant, is ideal. Duriron Fans are available in a wide range of capacities to take care of almost any condition and with little attention.

All parts coming in contact with the fumes are made of Duriron; no coating or lining is needed. Each fan casing is equipped with proper openings for the drainage of the condensate.

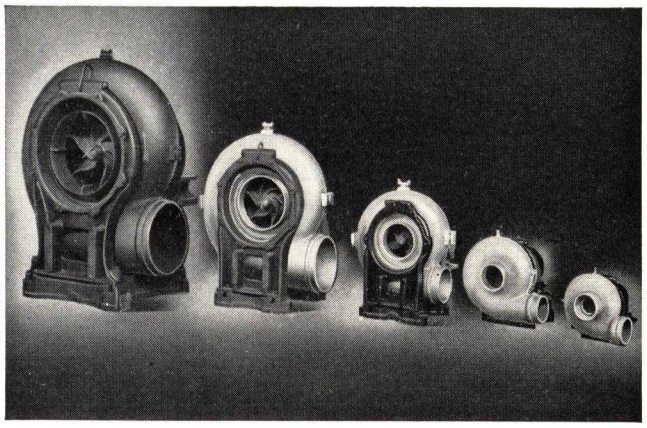
The impellers are mounted directly on the motor shafts, with the motors mounted on rubber cushions. This results in the reducing of vibration to a minimum. The impeller shaft is provided with a stuffing box to prevent the escape of fumes into the motor. All moving parts can be withdrawn without disturbing the duct connections.

When Duriron Fans are to be located in a chemistry laboratory or other location in which utmost quiet is desired, the "quiet operating" motors are recommended, especially with single phase motors.

Adequate exhaust fan equipment is important, and we suggest the selection of somewhat excess capacities, operated at conservative speeds, rather than barely sufficient exhausting capacity at the extreme speeds permissible. This applies also to duct capacities where oversizes are preferable.

Bulletin No. 1101 contains complete data on Duriron Exhaust Fans. A copy will be sent on request.

Flues for acid fumes should be made of vitrified brick and acid cement or of brick lined with vitrified tile. Acid fumes destroy cement mortar used in flues of ordinary brick and mortar construction. Sand lime brick is not satisfactory.



DURIMET DUCTS

Durimet "K," for fume ducts, is a nickel-chromium (stainless) alloy steel resistant to a wide range of corrosive fumes and is the only steel resistant to weak sulphuric acid. It is stronger than mild steel, is ductile, malleable and machinable.

Durimet "K" is extremely satisfactory for ducts for the disposal of corrosive fumes from battery stations, telephone buildings and for chemical laboratories.

In some atmospheres, Durimet "K" becomes discolored although not corroded. For this reason it is best to paint it if exposed to public view.

Durimet "K" sheet for duct work is carried in stock in the gauges and sizes listed here:

U.S.S. Gauge	Size Sheet	Theor. Wt., Lbs. per Sq. Ft.
16	36″ x 96″	2.63
20	36″ x 96″	1.58
22	36″ x 96″	1.32
24	30″ x 96″	1.05

Bolts and rivets are available for fabricating.

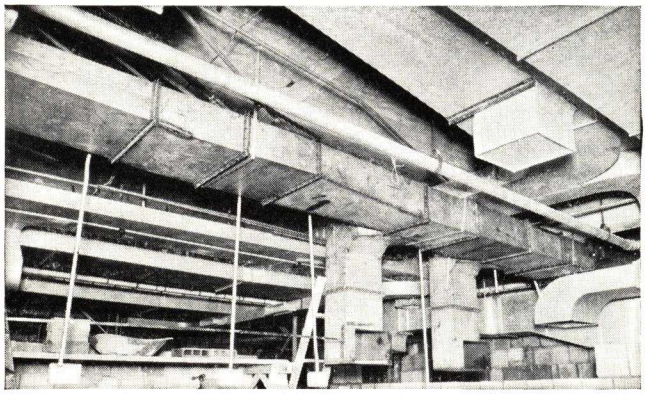
Durimet "K" is readily fabricated in welded, crimped or riveted construction. The material is so ductile that it does not crack when bent on a radius equal to the thickness of the sheet.

Soldering is difficult and not generally satisfactory. Fusion welding with the oxyacetylene torch is recommended.

Durimet "K" can be welded readily to ordinary steel and can be brazed to bronze or brass. This method of construction can be used where the joint so made will not be in contact with any corrosive elements. It is a satisfactory way to obtain additional stiffness in the duct, or for bracing or support on the outside of the duct.

Structural shapes are not available in Durimet "K". Where small angles are required, such shapes can be formed from strips cut from sheet stock.

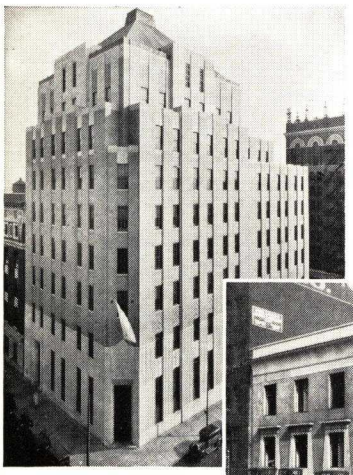
It is advisable to install drainage connections from the ducts at proper locations. Such a point would be the junction of a vertical section of the duct with a horizontal. Horizontal ducts should be installed in such a manner that each specific area will be drained at a definite point.



ARCHITECTURAL USES • • • •

Firestone Tire Store, Inc., Houston, Tex., uses Duriron for battery service room. R. F. Taylor, Mechanical Engineer

The Killian Co., Cedar Rapids, Iowa, use Duriron in restaurant kitchen



Chesapeake & Potomac Telephone Exchange, Richmond, Va., has Duriron in the battery room. Archts.: Voorhees, Gmelin & Walker, New York

Wayne County Morgue, Detroit, Mich., has Duriron in autopsy rooms, laboratory and refrigeration plant. Archt.: Aaron H. Gould & Son, Detroit

Soda Fountain in Western Union Building, Atlanta, Ga., Duriron specified by Western Union engineers

Walgreen Drug Store in Minimax Building, Houston, Tex., Duriron used in pharmacy. Archt.: Jos. Finger, Houston

FOR SCHOOL and • • • • Typical Installations-

Boston University, Boston, Mass.
California Institute of Technology, Pasadena, Calif.
University of Illinois, Urbana, Ill.
Columbia University, New York, N. Y.
University of Missouri, Columbia, Mo.
City-County Hospital, Houston, Texas.
University of Washington, Seattle, Wash.
State Medical & Surgical Building, Cranston, R. I.
Duke University, Durham, N. C.
Yale University, New Haven, Conn.
Beth Israel Hospital, New York, N. Y.

FOR COMMERCIAL and • • • Typical Installations-

The Palmer House, Chicago, Ill.
Spreckels Sugar Co., Woodland, Calif.
Sewage Disposal Plant, Toledo, Ohio.
U. S. Mint, Denver, Colo.
Atlanta Journal, Atlanta, Ga.
Buick Motor Car Co., Flint, Mich.
Edison Institute, Detroit, Mich.
Mellon Institute, Pittsburgh, Pa.

FOR VARIOUS CONDITIONS • • Typical Installations-

Firestone Service Stations, in many places.
Goodyear Service Stations, in many places.
New York Dock Co., Brooklyn, N. Y.
Trico Products Co., Buffalo, N. Y.
U. S. Treasury Dept., New York, N. Y.
U. S. Navy Yard Hangar, Philadelphia, Pa.
U. S. Northeastern Penitentiary, Lewisburg, Pa.
Town Hall Building, Wilkes-Barre, Pa.
Filtration Plant, Bristol, Tenn.
Jeffrey Mfg. Co., Columbus, O.
Walgreen's Drug Stores, in several cities.
Graffenburg Dairy, Utica, N. Y.
Christian Science Publishing House, Boston, Mass.
Lever Bros. Co., Roby, Ind.
Dr. D. C. Speas residence, Winston-Salem, N. C.

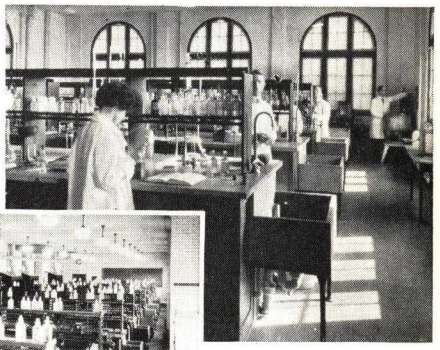
• • • • OF DURIRON PRODUCTS

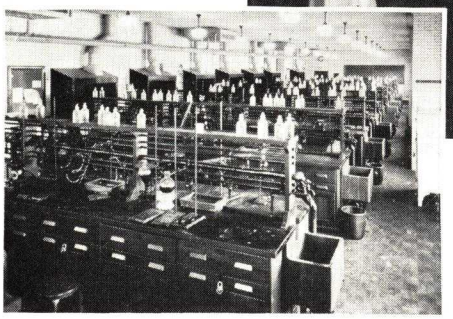
• • HOSPITAL LABORATORIES and Applications:

More than three thousand schools and hospitals have Duriron Drain Pipe, some of the installations having been in over 20 years.

Most of these are in laboratories for the disposal of corrosive wastes and fumes. The equipment used includes such items as Acid-Proof Drain Pipe and Fittings, sinks, sink strainers, overflows, Kjeldahl Digestion Units, exhaust fans and similar laboratory equipment.

Johns Hopkins University, Baltimore, Md., has Duriron sink strainers, pipe and fittings





Duriron-equipped Organic Laboratory in Science Bldg., Univ. of Ark., Little Rock, Ark. Arch.: Wittenberg & Deloney.

• • INDUSTRIAL BUILDINGS and Applications:

Many of these installations are in conjunction with testing laboratories, engraving plants, for the disposal of commercial acids under low pressure, for kitchen wastes and similar applications.

Other installations include centrifugal pumps, both plain and self-priming, valves and flanged pipe and fittings in sewage disposal plants, filtration and purification plants, acid sumps and similar places.

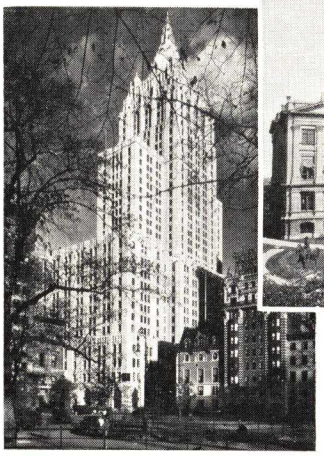
Beth Israel Hospital, New York, has two carloads of Duriron. Archt.: Louis Abramson; Engineer: A. E. Hansen

Life Sciences Building, Univ. of Calif., Berkeley, has Duriron fans, Kjeldahl equipment, drain pipe and fittings. Archt.: George W. Kelland, San Francisco

Duriron used in Photostat and engraving departments of New York Life Insurance Bldg., New York. Archt.: Cass Gilbert, New York.

• • • • • • and PLACES and Applications:

There are many and varied uses for Duriron Drain Pipe. For instance: in soda fountains where the carbonated water has a corrosive effect; in battery stations, either sales and service, or those in emergency lighting plants used in hospitals, theaters, telephone buildings; as drains for the acid from photostat equipment, photographic studios; for all roof vents where the sulphur in the atmosphere combines with moisture to form an extremely corrosive liquid; for drains through cinder fills where corrosion attacks the outside of the pipe; in memorial buildings where for esthetic reasons the drains are concealed within the walls or ceiling; in photoengraving plants; in kitchens of restaurants and cafeterias where the food acids, cleaning solutions and scouring powders cause much deterioration of ordinary drain pipe materials; for urinals in public lavatories.



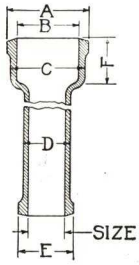
Duriron was used in State Chemist's Dept. in State Capitol Building, Atlanta, Ga.

PIPE

BRANCHES

BENDS

NOTE: *Larger sizes pipe than shown not regularly stocked, but furnished on special order.*



DIMENSIONS (IN INCHES) OF DURIRON PIPE

Size	1½	2	3	4	6	8	10	12	15
A	3 13/16	4 5/16	5 5/16	6 5/16	8 1/2	11 1/4	14 1/4	16 3/4	20 1/4
B	2 13/16	3 5/16	4 5/16	5 5/16	7 5/16	9 5/8	12 1/4	14 1/2	17 3/4
C	3 7/16	3 15/16	5 1/16	6 1/16	8 3/16	10 7/8	13 3/4	16	19 3/4
D	2 1/8	2 5/8	3 5/8	4 5/8	6 3/4	8 3/4	11 1/4	13 1/4	16 3/4
E	2 3/8	2 7/8	3 7/8	4 7/8	7 1/8	9 1/4	11 5/8	14	17 1/4
F	2 3/8	2 1/2	2 3/4	3	3	3 3/8	3 5/8	3 7/8	4 1/8

SINGLE HUB PIPE

Size, in.	Length, ft.	Over all length, ft.-in.	Wt., lb.
1½	3	3-2 3/8	20
2	4	4-2 1/2	32
3	5	5-2 3/4	56
4	5	5-3	86
6	5	5-3	135
8	5	5-3 3/8	217

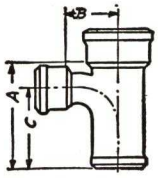
DOUBLE HUB PIPE

Size, in.	Length, ft.-in.	Over all length, ft.-in.	Wt., lb.,
1½	2-9 5/8	3-2 3/8	23
2	3-9 1/2	4-2 1/2	34
3	4-9 1/4	5-2 3/4	61
4	4-9	5-3	88
6	4-9	5-3	142
8	5-0	5-6 3/4	258

DOUBLE HUBS

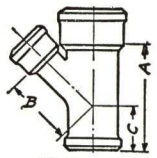
Size, in.	Wt., lb.	Dim. A, in.
1½	5½	1
2	6½	1
3	9	1
4	15	1
6	24	1
8	44	2

SANITARY T BRANCHES



T Branch

Size, in.	Wt., lb.	Dimensions, in. A	B	C	Size, in.	Wt., lb.	Dimensions, in. A	B	C
1½x1½	9	8 3/8	3 1/4	6 3/4	4x4	22	11	4½	8
2 x1½	10	8½	3½	6 3/4	6x2	35	9	5½	7
2 x2	11	9	3½	7	6x3	39	10	5½	7½
3 x1½	13	8½	4	6 3/4	6x4	44	11	5½	8
3 x2	14	9	4	7	6x6	52	13	5½	9
3 x3	17	10	4	7½	8x4	65	10 5/8	6¼	8
4 x1½	16	8½	4½	6 3/4	8x6	72	14½	6 5/8	10½
4 x2	18	9	4½	7	8x8	87	19	6 5/8	13½
4 x3	21	10	4½	7½					

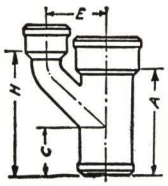


Y Branch

SANITARY Y BRANCHES

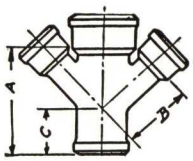
Size, in.	Wt., lb.	Dimensions, in. A	B	C	Size, in.	Wt., lb.	Dimensions, in. A	B	C
1½x1½	9	8 1/8	3 3/4	4 3/8	4x4	25	12	6 3/4	5 1/4
2 x1½	10	8 5/8	4 3/8	4 3/8	6x2	35	9	7 1/8	2 3/4
2 x2	11	9	4 1/4	4 3/4	6x3	39	10½	7 5/8	3½
3 x1½	13	8 5/8	5	3 7/8	6x4	44	12	8 1/8	4 1/4
3 x2	14	9	5	4 1/4	6x6	52	15	9 1/4	5 3/4
3 x3	17	10½	5½	5	8x4	71	13½	10	4½
4 x1½	17	9 1/8	5 3/4	3 7/8	8x6	87	16½	11	6 1/8
4 x2	18	9	5 3/4	3 3/4	8x8	122	19½	12 1/4	7 1/4
4 x3	21	10½	6 1/4	4½					

SANITARY UPRIGHT Y BRANCH OR H FITTING



Upright Y

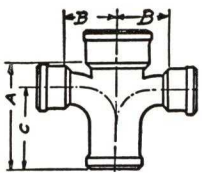
Size, in.	Wt., lb.	Dimensions, in. A	C	E	H	Size, in.	Wt., lb.	Dimensions, in. A	C	E	H
1½x1½	9	8 1/8	4 3/8	4	10	4x2	19	9	3 11/16	5½	11
2 x1½	11	8 5/8	4 3/8	4 1/4	10 1/4	4x3	22	10½	4½	6	12½
2 x2	12	9	4 3/4	4½	11	4x4	28	12	5 1/4	6½	14
3 x1½	14	8 5/8	3 7/8	4 3/4	10 1/4	6x2	36	9	2 11/16	6 3/4	11
3 x2	15	9	4 5/16	5	11	6x3	41	10½	3½	7 1/4	12½
3 x3	19	10½	5	5½	12½	6x4	46	12	4 1/4	8	14
4 x1½	18	9 1/8	3 7/8	5 1/4	10 3/4	6x6	56	15	5 3/4	8½	16 7/8



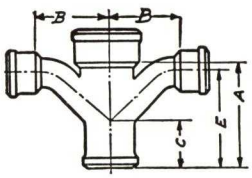
DOUBLE BRANCH SANITARY Y

1½x1½	11	8 1/8	3 3/4	4 3/8	4x2	21	9	5 3/4	3 3/4
2x1½	13	8 5/8	4 3/8	4 3/8	4x3	27	10½	6 1/4	4½
2x2	15	9	4 1/4	4 3/4	4x4	33	12	6 3/4	5 1/4
3x1½	13	8 5/8	5	3 7/8	6x2	42	9	7 1/8	2 3/4
3x2	15	9	5	4 1/4	6x3	51	10½	7 5/8	3½
3x3	21	10½	5½	5	6x4	55	12	8 1/8	4 1/4
4x1½	20	9 1/8	5 3/4	3 7/8	6x6	60	15	9 1/4	5 3/4

DOUBLE BRANCH SANITARY T



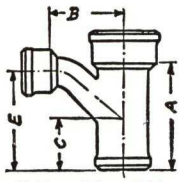
Size, in.	Wt., lb.	Dim., in. A	B+ B	C	Size, in.	Wt., lb.	Dim., in. A	B+ B	C
1½x1½	11	8 3/8	6½	6 3/4	4x2	20	9	9	7
2x1½	12	8½	7	6 3/4	4x3	26	10	9	7½
2x2	14	9	7	7	4x4	33	11	9	8
3x1½	18	8½	8	6 3/4	6x2	42	9	11	7
3x2	20	9	8	7	6x3	50	10	11	7½
3x3	21	10	8	7½	6x4	54	11	11	8
4x1½	19	8½	9	6 3/4	6x6	65	13	11	9



DOUBLE BRANCH COMBINATION Y AND 1/8 BEND

Size, in.	Wt., lb.	Dimensions, in. A	B+ B	C	E	Size, in.	Wt., lb.	Dimensions, in. A	B+ B	C	E
1½x1½	14	8 1/8	9 1/4	4 3/8	7 3/8	4x2	26	9	12½	3 11/16	8 3/16
2x1½	15	8 5/8	9 1/4	4 3/8	7 3/8	4x3	30	10½	14	4½	9 9/16
2x2	18	9	10½	4 3/4	8 1/4	4x4	45	12	15½	5 1/4	10 13/16
3x1½	21	8 5/8	10 1/4	3 7/8	7 3/8	6x2	44	9	14½	2 11/16	8 3/16
3x2	22	9	11½	4 3/16	8 3/16	6x3	53	10½	16	3½	9 9/16
3x3	29	10½	13	5	9 9/16	6x4	57	12	17½	4 1/4	10 13/16
4x1½	24	9 1/8	11 3/4	3 7/8	8 1/8	6x6	71	15	20½	5 3/4	13 7/16

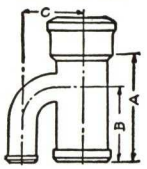
SANITARY T-Y OR COMBINATION Y AND 1/8 BEND



T-Y or Y and 1/8

Size, in.	Wt., lb.	Dimensions, in. A	B	C	E	Size, in.	Wt., lb.	Dimensions, in. A	B	C	E
1½x1½	9	8 1/8	4 5/8	4 3/8	7 3/8	4x2	19	9	6 1/4	3 11/16	8 3/16
2 x1½	11	8 5/8	4 5/8	4 3/8	7 3/8	4x3	22	10½	7	4½	9 9/16
2 x2	12	9	5 1/4	4 3/4	8 1/4	4x4	28	12	7 3/4	5 1/4	10 13/16
3 x1½	14	8 5/8	5 1/8	3 7/8	7 3/8	6x2	26	9	7 1/4	2 11/16	8 3/16
3 x2	15	9	5 3/4	4 3/16	8 3/16	6x3	34	10½	8	3½	9 9/16
3 x3	19	10½	6½	5	9 9/16	6x4	36	12	8 3/4	4 1/4	10 13/16
4 x1½	18	9 1/8	5 7/8	3 7/8	8 1/8	6x6	47	15	10 1/4	5 3/4	13 7/16

Vent Branch



VENT BRANCHES

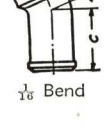
Size, in.	Wt., lb.	Dim., in. A	B	C
2x2	11	9	7	4½
3x2	14	10	7	5
3x3	18	10	7½	5½
4x2	18	11	7	5½
4x3	20	11	7½	6
4x4	26	11	8	6½
6x3	32	13	7½	7¼
6x4	33	13	8	8
6x6	43	13	9	8½

SCREWED CLEANOUT PLUGS

Size, in.	Weight, lb.
1½	2¼
2	3½
3	5¼
4	8¾
*6	14

*Bolted type.

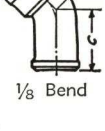
SIXTEENTH BENDS



1/16 Bend

Size, in.	Wt., lb.	Dim., in. B	C
1½	4½	1	4½
2	6	1 1/8	4 5/8
3	9	1 1/4	4 11/16
4	12	1 3/8	4 13/16
6	17	1½	5
8	44	2	7 1/8

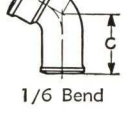
EIGHTH BENDS



1/8 Bend

Size, in.	Wt., lb.	Dim., in. B	C
1½	5	1 5/8	5 1/8
2	6	1 3/4	5 1/4
3	9	2	5 7/16
4	13	2 1/4	5 11/16
6	25	2 1/2	6 1/16
8	50	3 11/16	8 15/16

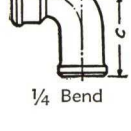
SIXTH BENDS



1/6 Bend

Size, in.	Wt., lb.	Dim., in. B	C
1½	5½	2	5 5/8
2	7	2 1/4	5 3/4
3	10	2 1/2	6
4	13	2 3/4	6 5/16
6	27½	3 3/8	6 7/8

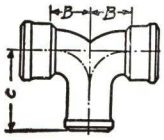
QUARTER BENDS



1/4 Bend

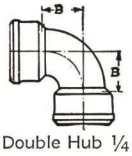
Size, in.	Wt., lb.	Dim., in. B	C
1½	6	3 1/4	6 3/4
2	7	3½	7
3	12	4	7½
4	16	4½	8
6	30	5½	9
8	67	6 1/8	10

DOUBLE QUARTER BENDS



Double 1/4

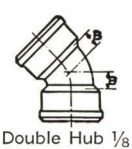
Size, in.	Wt., lb.	Dim., in. B+ B	C
1½	11	6½	6 3/4
2	12	7	7
3	17	8	7½
4	25	9	8
6	40	11	9



Double Hub 1/4

DOUBLE HUB QUARTER BENDS

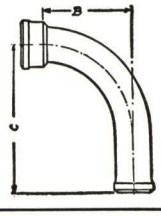
Size, in.	Wt., lb.	Dim., in. B
1½	8	3 1/4
2	9	3½
3	16	4
4	19	4½
6	39	5½



Double Hub 1/8

DOUBLE HUB EIGHTH BENDS

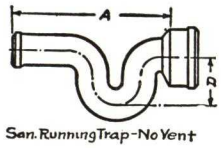
Size, in.	Wt., lb.	Dim., in. B
1½	6	1 5/8
2	7	1 3/4
3	13	2
4	17	2 1/4
6	34	2½



LONG SWEEP QUARTER BENDS

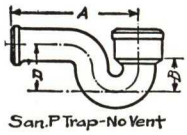
Size, in.	Wt., lb.	Dimensions, in. B	C
1½	10	8 1/4	11 3/4
2	12	8½	12
3	19	9	12½
4	28	9½	13
6	50	10½	14

RUNNING TRAP—NO VENT



Size, in.	Wt., lb.	Dim., in. A	Dim., in. B
1½	9	12⅛	4
2	13	13½	4½
3	21	15½	5½
4	40	17½	6½
6	48	21½	8½
8	155	26⅞	11

P TRAP (½ S TRAP)—NO VENT

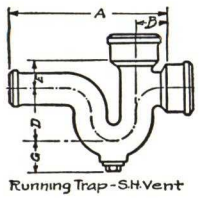


Size, in.	Wt., lb.	Dimensions, in. A	B	D
1½	8	10¼	2⅜	4
2	11	11	3	4½
3	19	12½	4¼	5½
4	27	14	5½	6½
6	67	17	8½	8½

S TRAP—NO VENT

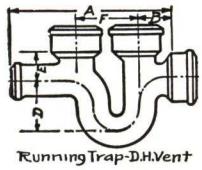
Size, in.	Wt., lb.	Dimensions, in. A	B	C	D
1½	9	5⅛	2⅜	7	4
2	14	5½	3	8	4½
3	22	6¼	4¼	10	5½
4	32	7	5½	12	6½
6	46	9	8½	16	8½

RUNNING TRAP—SINGLE HUB VENT (Showing Cleanout)

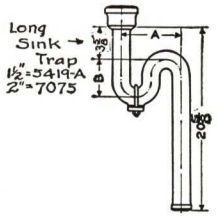


Size, in.	Wt., lb.	Vent, in.	Dimensions, in. A	B	D	E	G
1½	13	1½	12⅛	17⅛	4	17⅛	2¾
2	17	2	13½	2½	4½	2½	3
3	27	3	15½	3	5½	3¼	3½
4	43	4	17½	3½	6½	3½	4
6	60	4	21½	4½	8½	4¼	5
8	187	6	26⅞	5½	11	4¼	6

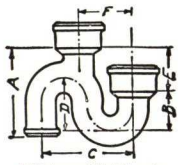
RUNNING TRAP—DOUBLE HUB VENT



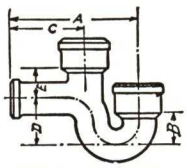
Size, in.	Wt., lb.	Vent, in.	Dimensions, in. A	B	D	E	F
1½	16	1½	12⅛	17⅛	4	17⅛	4¾
2	19	2	13½	2½	4½	2½	5¼
3	32	3	15½	3	5½	3¼	6¼
4	45	4	17½	3½	6½	3½	7¼
6	88	4	21½	4½	8½	4¼	8¼
8	208	6	26⅞	5½	11	4¼	12



S TRAP—HUB VENT



Size, in.	Wt., lb.	Vent, in.	Dimensions, in. A	B	C	E	F
1½	13	1½	8⅜	2⅜	7	3¼	4⅛
2	16	2	9¼	3	8	3¾	4¾
3	28	3	10½	4¼	10	4¼	6¼
4	39	4	11¼	5½	12	4¼	7
6	57	4	14	8½	16	5	9



P TRAP (½ S)—HUB VENT

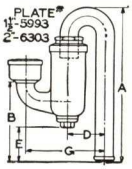
Size, in.	Wt., lb.	Vent, in.	Dimensions, in. A	B	C	D	E
1½	12	1½	10¼	2⅜	6⅛	4	1⅝
2	15	2	11	3	6¼	4½	2¼
3	24	3	12½	4¼	6¼	5½	3
4	38	4	14	5½	7	6½	3¼
6	82	4	17	8½	8	8½	4

LONG SINK TRAPS

Plate No.	Size, in.	Dim., in. A	Dim., in. B
5419-A	1½	6¾	4¼
7075	2	7¾	5

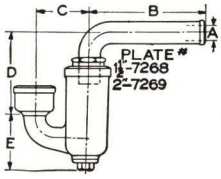
DRUM TRAPS

Plate No.	5872	5856	5872-A	5856-A	5498	6165
Size, in.	1½	2	1½	2	1½	2
Wt., lb.	16	22	14	20	27	31
Dimensions, in. A	6⅝	7¾	12¼	13¾	11	11⅜
Dimensions, in. B	4¼	5	4¼	5	2⅝	2¾
Dimensions, in. D	4½	4½	4½	4½	4	4½
Dimensions, in. E	1⅞	2¼	1⅞	2¼	9⅜	10⅜
Dimensions, in. G	3½	3¾	3½	3¾	2⅜	2⅝



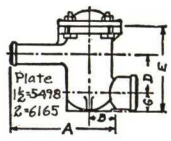
CENTRIFUGAL DRUM TRAPS (NON-SYPHON)

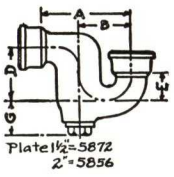
Plate No.	Size, in.	Wt., lb.	Dimensions, in. A	B	D	E	G
5993	1½	23	16½	8½	4	3½	8½
5993-A	1½	29	24½	16½	4	11½	8½
6303	2	38	20¼	13	5½	4	11
6303-A	2	44	28¼	21	5½	12	11

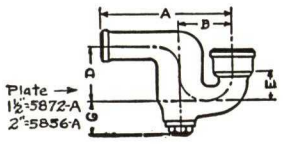


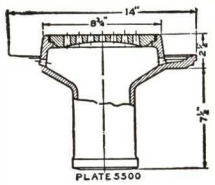
NON-SYPHON P TRAP

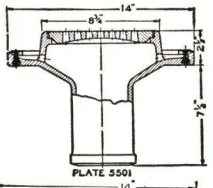
Plate No.	Size A, in.	Wt., lb.	Dimensions, in. B	C	D	E
7268	1½	18	8	4½	6¾	5¼
7269	2	28	8	5½	6	9

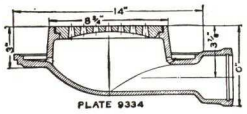


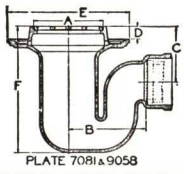


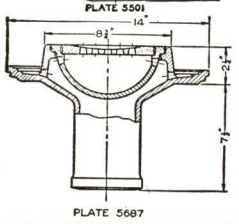








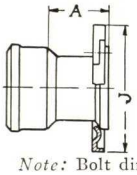




FLOOR DRAINS—DOUBLE DRAINAGE TYPE

Plate No.	Outlet size, in.	Wt., lb.	Dimensions, in. A	B	C	D	E	F	Flashing ring
5500	2, 3, 4 or 6	40	...	...	...	...	...	...	No
5501	2, 3, 4 or 6	40	...	...	...	...	...	...	Yes
7081-A	1½	30	4	6⅝	3⅞	1½	10⅜	9	No
7081-B	2	32	4	6½	3⅝	1½	10⅜	9	No
9058-3	3	75	8	9	5⅞	1½	14	14½	No
9058-4	4	79	8	9	6⅜	1½	14	14½	No
5687	2, 3, 4 or 6	72	...	...	...	...	...	...	No
5687-A	2, 3, 4 or 6	75	...	...	...	...	...	...	Yes
9334	2	40	...	...	...	...	...	...	No

ADAPTER—BELL AND FLANGE



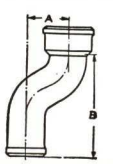
Size, in.	Wt., lb.	Dim. A, in.	Dim. J, in.
1½	7	2⅛	5
2	9	2½	6
3	14½	2½	7½
4	21	2¾	9
6	30	3	11
8	35	3½	13½

Note: Bolt dimensions U. S. 1914 Standard.

SANITARY REDUCERS

Size, in.	Wt., lb.	A, in.	Size, in.	Wt., lb.	A, in.
2x1½	5	5	6x2	12	5
3x1½	6	5	6x3	13	5
3x2	7	5	6x4	14	5
4x1½	7	5	6x5	18	5
4x2	8	5	8x4	27	6
4x3	9	5	8x6	29	6
5x4	12	5			

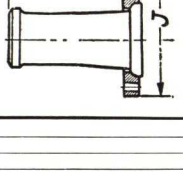
SANITARY OFFSETS



Size in.	Dimensions, in. A	B	Wt., lb.
1½	2	8⅛	7½
1½	4	8⅝	9¼
1½	6	9⅛	9½
1½	8	9⅝	10½
1½	10	10⅛	11½
1½	12	10⅝	12½
2	2	8	8
2	4	8½	9½
2	6	9	11
2	8	9½	14
2	10	10	15
2	12	10½	16
3	2	8½	12
3	4	9½	13
3	6	10	15
3	8	10½	16½
3	10	11	18
3	12	11½	19½

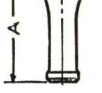
Size in.	Dimensions, in. A	B	Wt., lb.
4	2	9	19½
4	4	11	23
4	6	11	26
4	8	11½	29
4	10	12	34½
4	12	12½	37½
6	2	10	33
6	4	12	38½
6	6	13	44
6	8	13½	48
6	10	14	52
6	12	14½	55

ADAPTER—SPIGOT AND SPLIT FLANGE



Size, in.	Wt., lb.	Dim. A, in.	Dim. J, in.
1½	6	5¼	5
2	9	5¾	6
3	16	7	7½
4	24	8	9
6	32	9½	11
8	45	10¾	13½

SANITARY INCREASERS



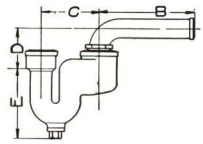
Size, in.	Wt., lb.	A, in.	Size, in.	Wt., lb.	A, in.
1½x2	7	9	3x6	16	9
1½x3	8½	9	4x5	16	9
1½x4	10½	9	4x6	17½	9
2x3	9	9	4x8	43	11⅝
2x4	11	9	5x6	18	9
2x6	15	9	6x8	50	11⅞
3x4	13	9			

(See page 9 for other traps)

DURIRON Can't Pull Anti-Syphon Trap

The Duriron Can't Pull Anti-Syphon Trap is produced and sold under license agreement with the Buffalo Wash Tray Works, Inc., Buffalo, N. Y. The trap is simple in operation and retains a perfect water seal under all conditions of service. Vent connections are not needed to prevent syphoning.

The Duriron Can't Pull Anti-Syphon Trap is acid-proof; anti-syphon; perfect sealing; non-clogging; easily installed. In sizes 1½" and 2". Made in all Duriron Company alloys.



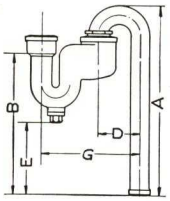
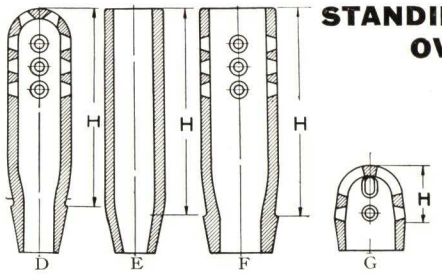


Plate No.	Size	Wt. Lbs.	Dimensions, in Inches					
			A	B	C	D	E	G
3751-S	1½	26	16⅜	10⅝	....	4	3¼	10¾
3751-SA	1½	28	24½	18¾	....	4	11⅜	10¾
3480-S	2	39	20⅛	13¼	....	5½	4½	13
3480-SA	2	42	28⅛	21¼	....	5½	12½	13
3751-P	1½	22	....	8	6¾	4¾	7	....
3480-P	2	32	....	8	7½	5⅝	8¾	....

STANDING OVERFLOWS



Style	Size, in.	Plate No.	H, in.	Type
D	1½–2	5692	4¾	Beehive
D	1½–2	5692-A	9¼	Beehive
D	1	8210	4⅞	Beehive
D	1½–2	7189-B	9½	Beehive
D	1½–2	7189-C	4	Beehive
D	1½–2	7189-D	6	Beehive
D	1½–2	7189-E	8	Beehive
E	1	7796*	9 max.	Open end
E	1½–2	5962	9 max.	Open end
F	1½–2	7032	8½	Open end
G	1	8888	1⅛	Beehive
G	1½–2	7365	1⅜	Beehive

No standing overflows can be furnished for strainers Nos. 5733, 8608, 8711, 8730, 9662.

*Not kept in stock. Shipment one week.

DURIRON SINK STRAINERS

SELECTION DRAWINGS

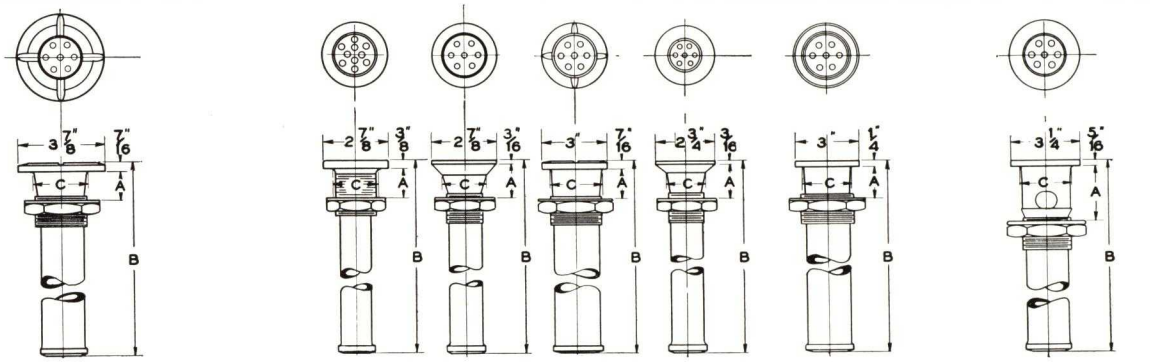


Plate No.	5588	7113	7188	1348	341†	5773	6985	7334	7424	7594	9984†	8121*	9740†*
Size, ins.	1½, 2	1½, 2	1½, 2	1	1	1	1	1½, 2	1	1½, 2	1	1½, 2	1½, 2
A	1 to 2	1 to 2¼	1 to 2	⅞ to 1¾	1 to 2	¼ to 1¾	1 to 2¼	1 to 2	½ to 1⅛	1 to 2	¼ to 1	2 to 3¼	½ to 2
B	10	13	4⅝	11¼	13	8⅝	10	10	10	10	10	10	10
C	2½	2½	2½	2	2⅜	2⅛	2¼	2½	1¾	2½	1⅝	2½	2⅝

SELECTION DRAWINGS

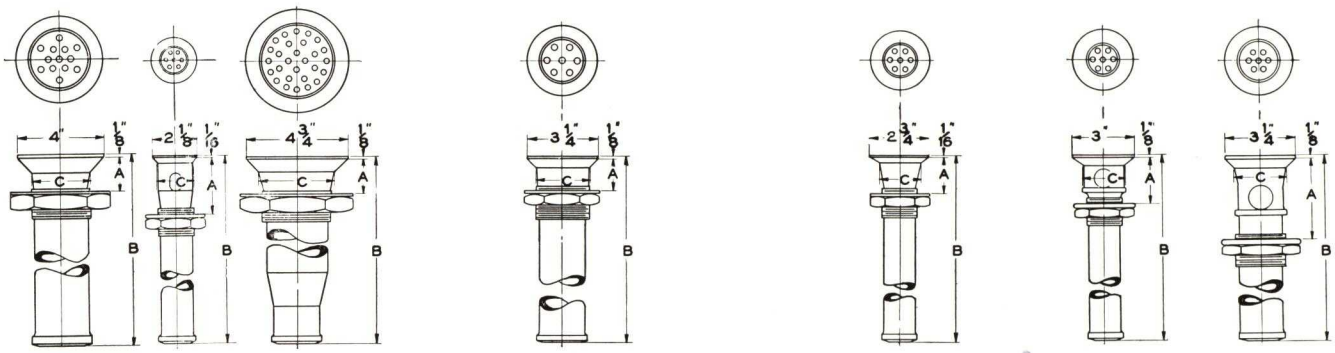


Plate No.	8608	8711*	8730	8909	565†	1055†	9318	2602	9662*	9387†*
Size, ins.	2	1	1½	1½, 2	1½, 2	1½, 2	1	1½, 2	1	1½, 2
A	1 to 1¾	2 to 2¾	1¼ to 2¼	1 to 2	1 to 1½	½ to 1¼	¼ to 1⅜	½ to 1¼	1¼ to 2¼	2¾ to 4¼
B	5¼	10	7	10	10	12⅝	10	10	10	10
C	3	1¾	3¾	2½	2½	2 5/16	2	2½	2	2½

Furnished with flat loose strainers.
Nos. 5733, 8608, 8711, 8730 and 9662 are not ground for Duriron stoppers or overflows.
†Not kept in stock. Shipment one week. *For sink with patent overflow.

LABORATORY SINKS AND BRACKETS

FLAT RIM SINKS

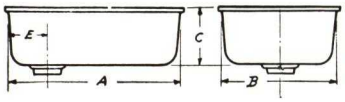
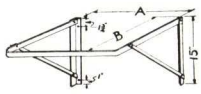


Plate No.	Wt., lb.	Dimensions, in.			
		A	B	C	E
5851	72	16	14	8	5 3/8
5852	103	24	16	8	5 7/16
5853	120	28	16	8	5 7/16
5964	73	17	9	10	8 1/2
7924*	58	14	10 1/2	9	5 3/8
7925*	68	16	12	9	5 3/8
8142*	45	15 1/4	7 1/4	7 1/2	7 5/8

*Not carried in stock.

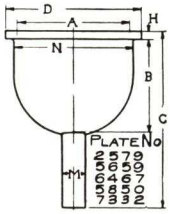


STEEL BRACKETS

Size	To fit sink No.	Dim., in.	
		A	B
1	5851	16 1/8	14 5/8
2	5852	24 1/8	16 5/8
3	5853	28 1/8	16 5/8
4	5964	17 1/8	9 5/8

HEMISPHERICAL SINKS

Duriron Hemispherical Sinks are used in fume hoods and tops of tables.



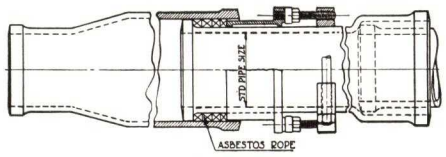
When set in a hood, one bowl should be placed in each compartment, recessed so that the top of the sink rim is slightly below the working surface.

A drainage groove should be provided in the floor of the hood, sloping to the sink across the rear of the hood.

Plate No.	Size (i.d.) outlet in.	Dimensions, in.					
		A	B	C	D	H	M
2579	1 1/2	3	3 7/8	12	4 1/4	3/8	2
5649	1 1/2	5	5	11	6 1/4	3/8	2
6467	1 1/2	6	6	12	7 1/2	1/2	2 1/4
5850—1 1/2	1 1/2	8	4 1/2	10 1/2	9 1/2	1/2	2 1/4
5850—2	2	8	4 1/2	10 1/2	9 1/2	1/2	2 3/4
7332—1 1/2	1 1/2	12	6	12	13 1/2	5/8	2 1/4
7332—2	2	12	6	12	13 1/2	5/8	2 3/4

DURIRON EXPANSION JOINTS

When drainage systems are subject to unusual variations in temperature, special provision must be made for expansion.



Duriron Expansion Joint

The Duriron expansion joint is the same length as a full piece of corresponding pipe so that it may be installed without difficulty. Made in 3", 4", and 6" sizes. These sizes are carried in stock; other sizes made to order when required.

Care must be taken to provide suitable anchors for the pipe line at points midway between expansion joints. In extreme cases it may also be necessary to provide locking clamps at all pipe joints. Our experience on this point is available without any obligation.

DURIRON ROPE ASBESTOS PACKING

Duriron asbestos packing is made from commercially pure asbestos treated with special materials to make it most desirable for acid service. Pure asbestos rope should always be specified instead of hemp or oakum which are not acid proof.

In packing a joint, the packing should be separated into two or three strands, laid in so that the ends will overlap, and tightly rammed.

The amounts of packing given here fill up the bell or hub from 1 1/2" to 1 3/4" from the top. The rest of the space is used for the molten lead.

DURIRON ROPE ASBESTOS PACKING

Pipe size, in.	1 1/2	2	3	4	6	8
Weight per joint, lb.	0.14	0.16	0.22	0.26	0.35	0.44
Length, in.	10	12	16	19	26	33

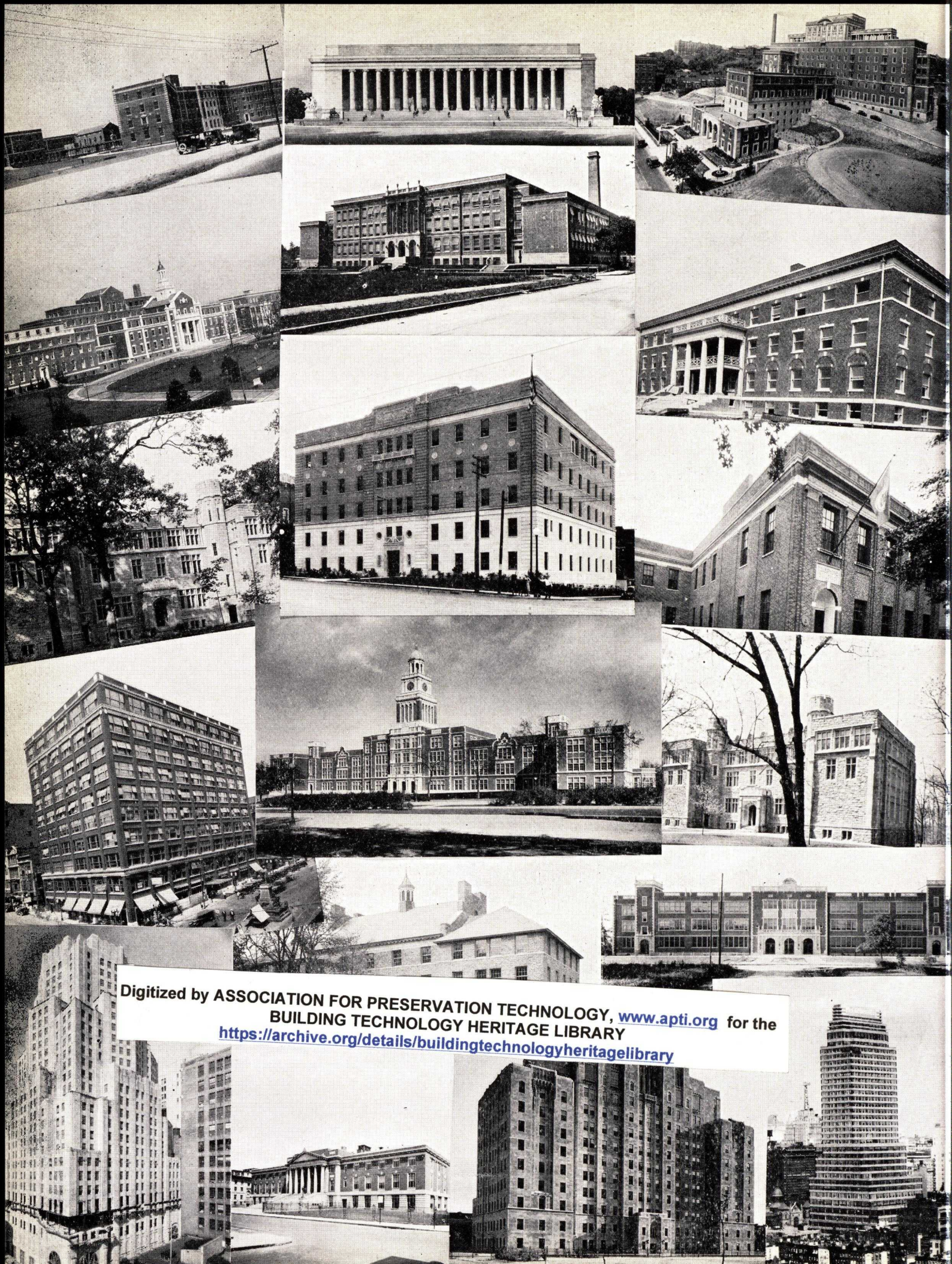
Note: 100 ft. (1200 in.) of this packing weighs 16 lb.

OTHER LABORATORY EQUIPMENT

Many educational and hospital laboratories have occasion to perform protein, nitrogen or ammonia determinations by the Kjeldahl digestion process. For this purpose, there is available a complete Duriron digestion unit which does not require the use of a hood. Send for Bulletin No. 160 for detailed data.

Large laboratories often find it desirable to provide a container for the acid cleaning of glassware. Duriron jacketed kettles, heated by steam or hot water, are available in two standard sizes, 13 gal. and 35 gal. Send for Bulletin No. 169.

For commercial laboratories, the Duriron No. 2A Centrifugal Pump is a convenient size. It has a capacity range from 2 1/2 g.p.m. against a 25 ft. head to 25 g.p.m. against a 5 ft. head, with a 1/4 h.p. motor. Bulletin 169 contains complete data.



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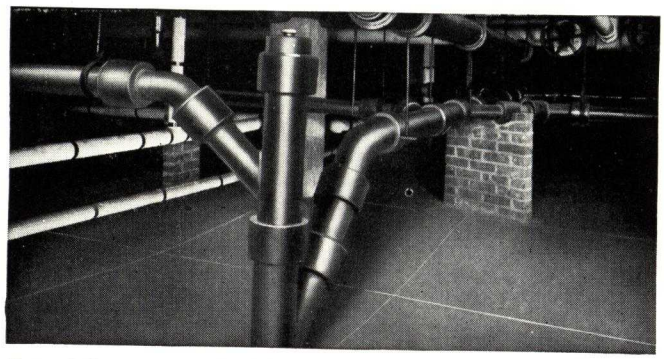
GENERAL CERAMICS COMPANY

Manufacturers of Acid-Proof Chemical Stoneware

30 Rockefeller Plaza, NEW YORK, N. Y.

ACID-PROOF CHEMICAL STONEWARE LABORATORY EQUIPMENT

The Chemical Stoneware Division of the General Ceramics Company makes a complete line of acid-proof chemical stoneware equipment for chemistry and physics laboratories in educational and research institutions; for general industrial chemical purposes; and for hospitals, electro-plating plants, newspapers, photo-engraving shops, and other establishments where corrosive fluids are used.



General Ceramics Chemical Stoneware Piping in the Sterling Chemistry Laboratory at Yale University

General Ceramics Chemical Stoneware Laboratory Equipment is widely used in educational institutions throughout the country. In fact, a list of the colleges and universities with chemistry laboratories equipped with General Ceramics Chemical Stoneware is practically a roster of our leading institutions of learning, including among many others Yale, Harvard, California Institute of Technology, Vassar, Radcliffe, Duke, Pittsburgh, Wesleyan, Lehigh, Tulsa, Toledo, Berea, Purdue, Vanderbilt, McGill, and the State Universities of Maryland, Illinois, New Hampshire, Connecticut, Indiana, Pennsylvania, Ohio, Wisconsin, Nevada, California, and California at Los Angeles. General Ceramics equipment is used also in such buildings as the Walter Reed Hospital in Washington, the Curtis Publishing Company Building in Philadelphia, and, in New York, the Times Building, Metropolitan Life Building, and United States Assay Office.

The General Ceramics line of stoneware equipment includes laboratory sinks, drain lines and fittings, sumps, fume ducts, pumps, ventilating fans, and countless other items.

Description

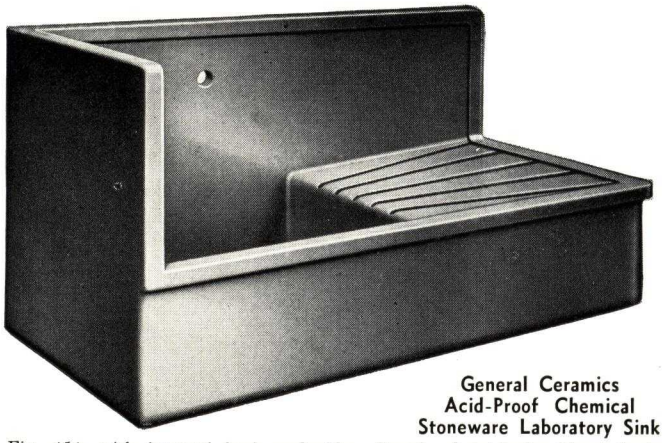
General Ceramics Chemical Stoneware is a dense granite-like material with an attractive glazed surface. Both the glaze and the body of the ware are completely impervious to all acids and other chemicals, excepting hydrofluoric acid. The surface glaze is an integral part of the ware itself and therefore free from crazing and cracking. General Ceramics Ware is mechanically strong, leak-proof, and easy to keep clean, and it cannot contaminate the chemicals handled. It lasts indefinitely and there is no upkeep or replacement expense.

Engineering Service and Catalogues

Our Engineering Department will assist in selecting the right stoneware equipment for any requirements. We co-operate in laying out laboratories and other buildings where corrosive products are handled, also in the design of special chemical apparatus. A new Bulletin on General Ceramics Laboratory Sinks will be furnished, on request.

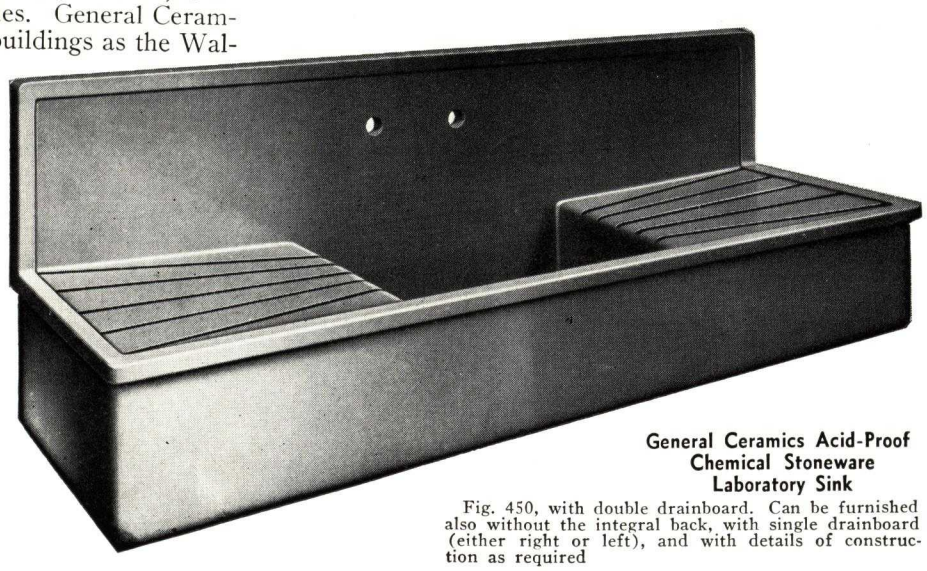
Specifications

Specifications should read as follows: "All parts of this installation subject to the action of acids or acid wastes are to be made of high-grade acid-proof chemical stoneware manufactured by the GENERAL CERAMICS COMPANY of New York."



General Ceramics Acid-Proof Chemical Stoneware Laboratory Sink

Fig. 454, with integral back and side. Can be furnished without back and side and in various other types and sizes



General Ceramics Acid-Proof Chemical Stoneware Laboratory Sink

Fig. 450, with double drainboard. Can be furnished also without the integral back, with single drainboard (either right or left), and with details of construction as required

MAURICE A. KNIGHT

Knight-Ware Acid, Alkali and Corrosion Proof Chemical Stoneware

AKRON, OHIO

SALES ENGINEERING OFFICES

NEW YORK, N. Y. CLEVELAND, OHIO | CHICAGO, ILL. NIAGARA FALLS, N. Y. | DETROIT, MICH. ST. LOUIS, MO. | LOS ANGELES, CAL. SAN FRANCISCO, CAL. | TORONTO, CAN. MONTREAL, CAN.

What Knight-Ware Is

Deairated Knight-Ware is an improved ceramic product having a tight, close-grained body which is tough, uniform, thoroughly vitrified and wholly inert to the action of acids, alkalis, chemicals, and corrosive solutions and gases, weak or strong, hot or cold. Its acid-proof qualities do not depend upon any glaze, enamel or veneer, "It is the body itself."

The dearing process eliminates such body defects as blisters, pinholes and lamination. It safely permits a reduced thickness of the ware, giving it greater resistance to thermal shock, a neater appearance and a decreased weight.

Where Knight-Ware Is Used

Knight-Ware Plant Equipment is used by the manufacturer and the user of chemicals, and in processes where contamination must be avoided.

Knight-Ware Laboratory Sinks, Table Troughs, Sumps and Piping are used in school, university and commercial laboratories, in hospitals, in newspaper buildings and wherever acid-proof waste or ventilating lines are necessary.

Deairated Knight-Ware is mechanically strong, and is equaled only by glass or fused silica in chemical inertness.

A typical specification should read, "All parts of job subject to the action of chemical wastes, acid fumes, or chemical corrosion shall be of Knight-Ware as manufactured by MAURICE A. KNIGHT of Akron, Ohio."

Knight-Ware Laboratory Sinks

Knight-Ware sinks are custom built to suit your requirements. Because they are entirely handmade, it costs no more for this service. The one-piece construction, smooth surfaces, rounded corners and acid-proof quality means a freedom from leaks and a cleanliness that is highly desirable, and what is more, permanent. Outlets of various designs are furnished as an integral part of the sink or separately as desired.

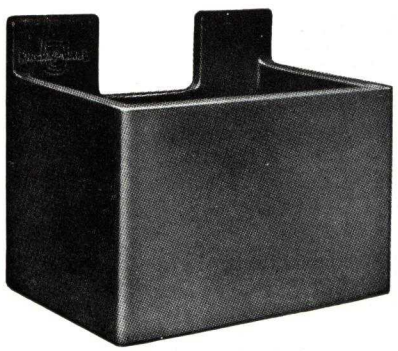
Knight-Ware Acid Waste Pipe and Fittings

Bell and spigot pipe and fittings are available in any bore from 1 up to 60 in. in any lengths up to 5 ft. Special fittings for unusual places or to eliminate unnecessary joints are furnished at no great increase in cost. Flanged or plain ground end connections can be furnished where desired.

Knight-Ware B&S joints packed and poured to our specifications are absolutely acid and leak proof. Installation is no more difficult than with ordinary cast iron pipe. Pressure-Flex, a new type rubber joint, is now available for an easily installed, positive connection.

Knight-Ware Acid Ventilating Pipe and Fittings

This pipe is furnished in round or rectangular cross section in bores of from 4 to 60 in. Bell and spigot, flanged, or plain butt end connections are available. Fume condensates are often more corrosive than the gas itself. Specify Knight-Ware for positive protection.



238 End Table Sink

Guaranty and Service

All Knight-Ware is guaranteed to be acid-proof, free from defects and satisfactory in every respect.

We are prepared to assist you in making layouts using Knight-Ware, and with special designs for piping and sinks.

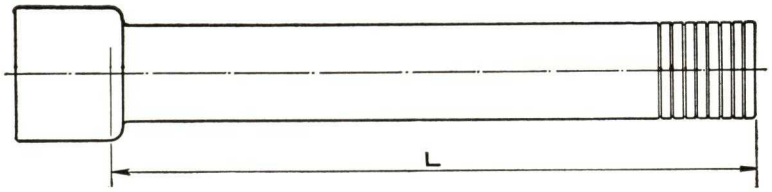
Literature

Our 48-page catalog on Knight-Ware Laboratory Equipment containing complete details and fully illustrated will be sent upon request.

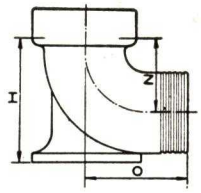
275-A—Table Trough

SOME KNIGHT-WARE INSTALLATIONS

INSTITUTION	ARCHITECT	ENGINEER	CONTRACTOR
Princeton University	Charles Z. Klauder	Louis T. Klauder	John Black & Son C. H. Cronin, Inc.
Columbia University	McKim, Mead and White	McKim, Mead and White	James McCullagh
Ohio State University	Jos. N. Bradford Howard Dwight Smith		Sam'l A. Esswein Spohn Plumbing & Heating
Columbia-Presbyterian Medical Center	James Gamble Rogers	Fred Brutschy	W. G. Cornell Co.
New York-Cornell Medical Center	Coolidge, Bullfinch, Shepley & Abott	James A. Cotter	John McMillan & Co., Inc.
Brooklyn College	Randolph Evans	Frank Sutton	J. L. Murphy, Inc.
Massachusetts Institute of Technology	Coolidge and Carlson	Chas. T. Main Stone & Webster	Wm. H. Mitchell & Sons Co.
Mellon Institute of Industrial Research	Jansen & Cocken	Janssen & Cocken	Mellon-Stuart
Duke University	Horace Trumbauer	Duke Construction Co.	Duke Construction Co.
Purdue University	Walter Scholer	R. T. Hamilton	A. E. Kemmer
McGill University	Nobbs & Hyde	Combe & Ryan	John Colford, Ltd.
University of Washington	Naramore, Thomas & Grainger	Lincoln Bouillon	Allied Plumbing & Heating Co.

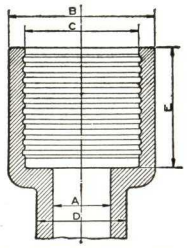


Right:
272-AB Knight-Ware Base Elbow



271—KNIGHT-WARE SINGLE HUB PIPE

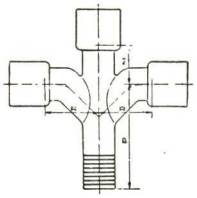
A	B	C	D	E	L	Wt. per ft., lbs.
1	3¼	2⅝	1⅝	3	1-3 ft.	2¼
1½	3½	2⅞	2⅛	3	1-4 ft.	3¼
2	4¼	3½	2¾	4	5	4
3	5½	4½	4	4	5	5½
4	6¾	5¾	5	4	5	8½
5	8	7	6	4	5	11
6	9⅛	8	7	4	6	15
8	11½	10¼	9¼	4	6	20
9	13¾	12¼	10⅝	4	6	24
10	14½	13	11⅝	4	6	28
12	16¾	15¼	13¾	4	6	36



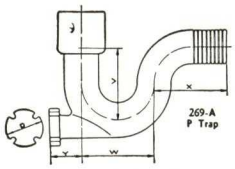
Detail of Knight-Ware Hub

272-AB—BASE ELBOW

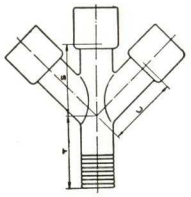
Bore	N	O	H	Wt., lbs.
4″	4″	8″	7½″	18
6″	6″	10″	10¾″	31
8″	10″	14″	15¾″	52
9″	10″	14″	16½″	63
10″	10″	14″	17¼″	77
12″	12″	16″	20¼″	100



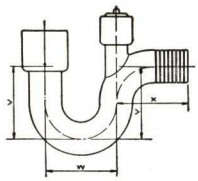
273B—Double T.Y.



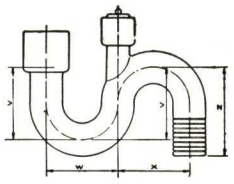
269-A, P Trap with Flange Cleanout



274A—Double Y Fitting



269—P Trap with Cleanout



268—S Trap with Cleanout

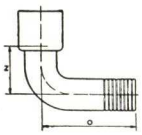
Bore, in.	P, in.	M, in.	R, in.	Wt., lbs.
1	8¾	3¼	3	6
1½	8¾	3¼	3	7
2	8¾	3¼	3	8½
3	8¾	3¼	4	12
4	13¼	4¾	6	28
5	13¼	4¾	7	38
6	13¼	4¾	8	52

Bore, in.	D, in.	V, in.	W, in.	X, in.	Y, in.	Wt., lbs.
1	4	4	4	6	2	5
1½	4	6	6	6	3	7
2	4	6	6	7	3¼	10½
3	5	8	8	8	4¼	17
4	5	9	9	9	4¾	28
5	5	9	9	10	5½	38
6	5	10	10	10	6¼	48

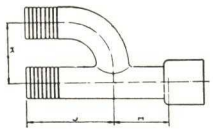
Bore, in.	S, in.	T, in.	U, in.	Wt., lbs.
1	6	6	6	7½
1½	6	6	6	10½
2	6	6	6	12
3	8	8	8	15
4	10	8	10	27
5	12	9	12	36
6	12	9	12	47

Bore, in.	V, in.	W, in.	X, in.	Wt., lbs.
1	4	4	6	4
1½	6	6	6	7
2	6	6	7	10
3	8	8	8	20
4	9	9	9	28
5	9	9	10	40
6	10	10	10	50

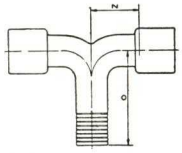
Bore, in.	V, in.	W, in.	X, in.	Z, in.	Wt., lbs.
1	4	4	4	5	6½
1½	6	6	6	7¼	7¼
2	6	6	6	7½	14
3	8	8	8	10	19
4	9	9	9	11½	30
5	9	9	9	12	42
6	10	10	10	14	52



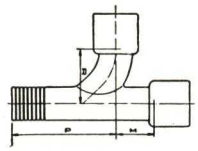
272A or B, ¼ and ⅛-in. Bends



273E—Vent T Fitting



272D—Twin Elbow



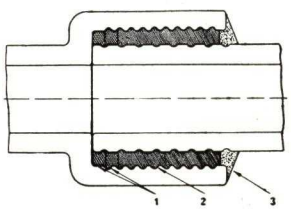
273-C—Single Sanitary T

Bore, in.	N, in.	O, in.	Wt., lbs.
1	4	8	2½
1½	4	8	3½
2	4	8	4½
3	4	8	8½
4	6	10	12¾
5	6	10	17
6	6	10	23

Bore, in.	J, in.	H, in.	K, in.	Wt., lbs.
1	8	4	4½	5½
1½	8	4	5½	6
2	8	4	5¾	7
3	8	4	7	9
4	12	6	8½	20
5	12	6	10½	26
6	12	6	11½	35

Bore, in.	N, in.	O, in.	Wt., lbs.
1	4	8	4½
1½	4	8	6
2	4	8	7
3	4	8	11
4	6	10	20
5	6	10	29
6	6	10	36

Bore, in.	P, in.	M, in.	R, in.	Wt., lbs.
1	8	4	4	5
1½	8	4	4	6
2	8	4	5	7
3	8	4	5	10
4	12	6	6	22½
5	12	6	6	27
6	12	6	7	38

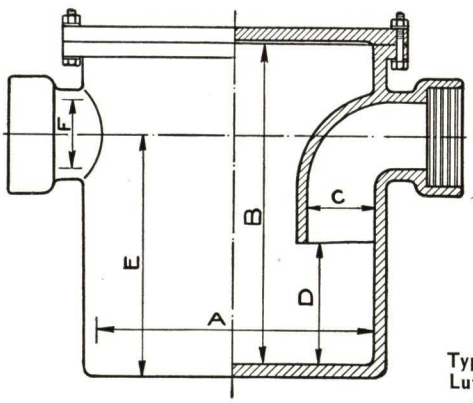


Method of Packing Bell and Spigot Joint

No. 1—Pure asbestos wicking; one ring for vertical and 2 rings for horizontal lines.

No. 2—Knight G-K Compound poured.

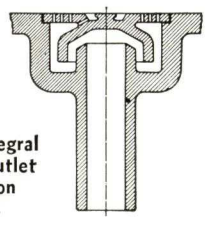
No. 3—Topping Material.



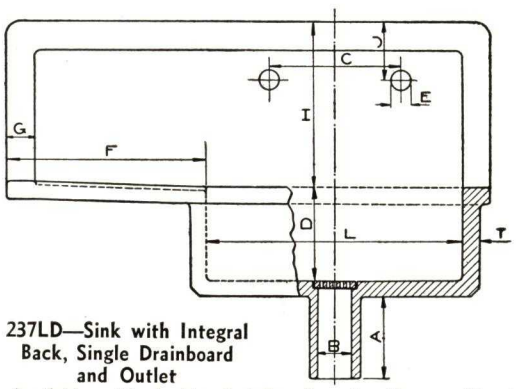
401—Knight-Ware Style "B" Sumps

401—KNIGHT-WARE STYLE "B" SUMPS

A	18½	24
B	24	36
C	4	4
D	12	15
E	17	28
F	4	4
Wt., lb.	175	400



Type A—Integral Lute Trap Outlet Available on All Sinks



237LD—Sink with Integral Back, Single Drainboard and Outlet

Available with double drainboard and with or without back or aprons. Measurements are optional

JENKINS BROS.

Manufacturer of Valves and Mechanical Rubber Goods

PRINCIPAL STORES AND OFFICES

NEW YORK, N. Y., 80 White Street
PHILADELPHIA, PA., 133 No. 7th Street
BOSTON, MASS., 524 Atlantic Avenue
CHICAGO, ILL., 822 Washington Boulevard
ATLANTA, GA., 376 Spring Street
BRIDGEPORT, CONN., 510 Main Street
FACTORIES IN BRIDGEPORT, CONN.

JENKINS BROS., LIMITED

CANADIAN WORKS AND HEAD OFFICE: 617 St. Remi Street, MONTREAL, QUE.
LONDON OFFICE: 6 Great Queen Street, Kingsway, W. C. 2

JENKINS BRONZE VALVES—FITTED WITH JENKINS RENEWABLE DISC

These Jenkins Valves offer the advantages of the genuine Jenkins Renewable Composition Disc. Made of various compositions to suit specific service conditions, the Jenkins Disc combines a resiliency that assures tight closing, with an unusual durability. The disc holder affords full protection for the entire rim of the disc and permits easy renewal. Many other superior features of design are described in the Jenkins Catalog.

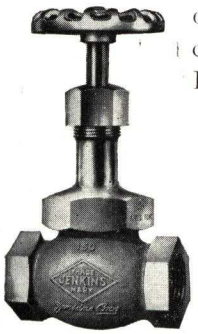


Fig. 105-A, Globe

REFERENCE CHART TO FIGURE NUMBERS OF JENKINS BRONZE VALVES

Pressures	Globe		Angle		Horizontal Check		Angle Check		Swing Check		Y or Blow-off		Quick Opening	
	Scrd.	Flgd.	Scrd.	Flgd.	Scrd.	Flgd.	Scrd.	Flgd.	Scrd.	Flgd.	Scrd.	Flgd.	Globe	Angle
Standard	106-A	107-A	108-A	109-A	117-A	316-A	118-A	317-A	352	353	124	125	941	943
Medium	600	.....	602	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
250 lb. extra heavy	801	802	803	804	807	808	809	810	.....	.....	.....	.....	.....	.....
300 lb. extra heavy	128	129	130	131	263	133	132	133a	260	262	134	135	246	248
Extra heavy—														
Special hard bronze	721	722	723	724	727	729	728	730	731	732	733	734	.....	.....

Consult Jenkins No. 23 Catalog for full details.

JENKINS BEVEL-SEAT "REGRIND-RENEW" VALVES

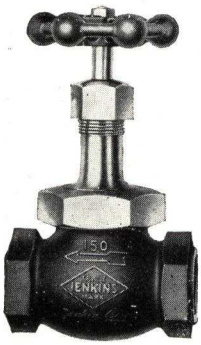


Fig. 890, Globe

Among the many excellent points of these valves is the Jenkins Improved Seating Arrangement for Regrinding Valves. Its special design allows you to regrind the valve more times without any damaging effect. Easily renewable and made of a special corrosion and erosion resistant alloy, both disc and seat ring have long life. The Jenkins Catalog gives complete details about the complete line covered in the chart below.

REFERENCE CHART TO FIGURE NUMBERS OF JENKINS BEVEL-SEAT "REGRIND-RENEW" VALVES

Pressures	Globe		Angle		Horizontal Check		Angle Check		Swing Check		*Globe		*Angle		*Horizontal Check		*Angle Check	
	Scrd.	Flgd.	Scrd.	Flgd.	Scrd.	Flgd.	Scrd.	Flgd.	Scrd.	Flgd.	Scrd.	Flgd.	Scrd.	Flgd.	Scrd.	Flgd.	Scrd.	Flgd.
Standard	890	.....	892	.....	896	.....	898	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Medium	950	951	952	953	756	757	758	759	762	763	795	796	797	798	946	947	948	949
Extra heavy	970	971	972	973	966	967	968	969	962	963	982	983	984	985	994	995	996	997

*Bolted bonnet valves. Medium patterns in 2½ and 3-in. sizes. Extra heavy patterns in 1½, 2, 2½ and 3-in. sizes. Consult Jenkins No. 23 Catalog for full details.

JENKINS PLUG-SEAT "REGRIND-RENEW" VALVES

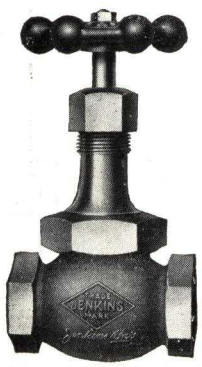


Fig. 956, Globe

Made with a plug-type seat which affords a larger area of seating surface, and permits throttling without cracking the seat, these Jenkins Valves are excellent for severe service conditions. Fig. 976 and Fig. 978, made for 300 lb. service, have a plug and seat of our JX500 special alloy steel exceeding 500 Brinell hardness . . . it practically nullifies wear and danger of wire drawing. Fig. 956, for 200 lb. service, and other valves in the line have a plug and seat ring made of a special nickel alloy of 300 Brinell hardness.

REFERENCE CHART TO FIGURE NUMBERS OF JENKINS PLUG-SEAT "REGRIND-RENEW" VALVES

Pounds Pressures (W.S.P.)	Globe		Angle		*Globe		*Angle	
	Scrd.	Flgd.	Scrd.	Flgd.	Scrd.	Flgd.	Scrd.	Flgd.
150	894	.....	895	.....	.....	.....	.....	.....
200	956	957	958	959	.....	.....	.....	.....
250	1156	977	1158	979	.....	989	.....	991
300	976	.....	975	.....	988	.....	990	.....

*Bolted bonnet valves made in sizes 1½, 2, 2½ and 3 in. Consult Jenkins catalog for full details.

JENKINS BRONZE GATE VALVES

Every feature of demonstrated worth to valve users is incorporated in Jenkins Bronze Gate Valves. Their advanced design is a result of Jenkins' 70 years experience. Remarkably strong bronze metals and painstaking craftsmanship add extra stamina and quality that means extra years of low-cost performance.

Fig. 370, Gate

REFERENCE CHART TO FIGURE NUMBERS OF JENKINS BRONZE GATE VALVES

Pounds pressure		Inside screw non-rising spindle		O. S. & Y. rising spindle		Inside screw traveling spindle		Split wedge inside screw traveling spindle	
		Steam and Oil, Water, Gas							
Steam	O.W.G.	Screwed	Flanged	Screwed	Flanged	Screwed	Flanged	Screwed	Flanged
125	200	370	371	368	369	47	48	62	63
*125	200	674	675	676	677	.....	.....	.....	.....
150	225	670	671	672	673	49	50	64	65
200	300	270	271	275	276	.....	.....	.....	.....
250	400	280	281	282	283	.....	.....	.....	.....
**300	.....	735	736	737	738	.....	.....	.....	.....

*Sizes 3½ in.
**Superheated steam to 700° F.

JENKINS IRON BODY VALVES—Renewable Disc Type

Reserve strength distinguishes these valves that incorporate a Jenkins Renewable Composition Disc. Bodies are unusually heavy and of the highest grade of gray iron, commonly termed "semi-steel." This metal has an average tensile strength of over 35,000 lbs. per sq. in. Cast bronze seat rings screw into the body in all sizes. Details in Jenkins Catalog.

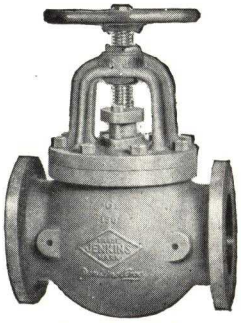


Fig. 142, Globe

REFERENCE CHART TO FIGURE NUMBERS OF IRON BODY RENEWABLE DISC-TYPE VALVES

Pressures	Globe		Angle		Horizontal Check		Angle Check		Swing Check		Y or Blow-off		Automatic Eq. stop and Check	
	Scrd.	Flgd.	Scrd.	Flgd.	Scrd.	Flgd.	Scrd.	Flgd.	Scrd.	Flgd.	Scrd.	Flgd.	Scrd.	Flgd.
Standard	141	142	143	144	151	153	152	153a	294	295	296	297	.....	.....
Medium	774	775	776	777	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Extra heavy	162a	162	163a	163	265	266	267	268	338	339	336	337	291	293

Consult Jenkins No. 23 Catalog for full details.

JENKINS IRON BODY REGRINDING VALVES

These valves have the advantage of the Jenkins Improved Bevel Seat Ring and Disc design. Because the diameter of the disc is scientifically correct in relation to the seat, you can regrind the valve more times without damaging the disc. The valve body is heavily constructed of highest grade gray iron, and other special features are provided that fit these valves for long, hard service.

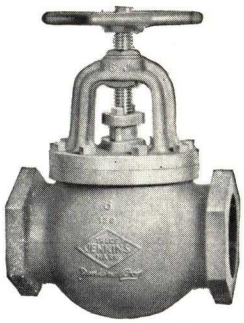


Fig. 912, Globe

FIGURE NUMBERS OF IRON BODY REGRINDING

Pressures	Globe		Angle		Horizontal Check		Angle Check	
	Scrd.	Flgd.	Scrd.	Flgd.	Scrd.	Flgd.	Scrd.	Flgd.
Standard	912	913	914	915	928	929	930	931
Medium	918	919	920	921	.....	.....	.....	.....
Extra Heavy	922	923	924	925	934	935	936	937

Consult Jenkins No. 23 Catalog for full details.

JENKINS IRON BODY GATE VALVES

Make a point-for-point comparison with other iron body gate valves. See the many superior features which Jenkins offers. Let your own judgment tell you whether a "Jenkins" is your "best buy."

REFERENCE CHART TO FIGURE NUMBERS OF IRON BODY GATE VALVES

Pressures	Solid Wedge						Double Disc				Hub End		Twin-Bolt			
	Inside screw		O. S. & Y. rising spindle		Quick-opening sliding stem and lever		Inside screw		O. S. & Y. rising spindle		Double Disc	Solid Wedge	Bronze mounted		All-iron	
	Scrd.	Flgd.	Scrd.	Flgd.	Scrd.	Flgd.	Scrd.	Flgd.	Scrd.	Flgd.			Scrd.	Flgd.	Scrd.	Flgd.
Standard	325	326	650	651	334	335	872	873	874	875	883	327	42	43	40	41
Medium	251	255	277	253	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Extra Heavy	203a	203	204a	204	.....	.....	876	877	878	879	.....	.....	.....	.....	.....	.....

Consult Jenkins No. 23 Catalog for full details.

All-Iron Gates with solid iron double face wedge; made with screwed bonnets in sizes ¼, ⅜ and ½ in.; or with bolted bonnets in sizes 3¼ in. and up.

Twin-bolt Iron Body Gates combining quality at low first cost are made in sizes ½ to 4 in.; either all-iron or bronze mounted.

All-Iron Globe and Angle Valves are made with screwed bonnets, sizes ½ to 2 in.

Radiator Valves

A wide variety is covered in Jenkins Catalog. Regular and low bonnet patterns; globe, angle, offset globe. Corner valves in straight or offset patterns, right or left hand. A black composition wheel is regularly fitted, but bronze wheel or lock shield and key are available. Finishes include chromium plate. Radiator gate valves are also obtainable.

Fire Line Valves

Types and sizes of Underwriters' approved angle and gate patterns for any building or service. For data see Jenkins Catalog.

ATEN SEWAGE DISPOSAL CO., INC.

TELEPHONE
LAckawanna 4-2770

286 Fifth Avenue
NEW YORK, N. Y.

ATEN SEWAGE DISPOSAL SYSTEMS

For Residences, Clubs, Schools, Hotels, Hospitals, Factories or Other Institutions Not Connected With City Sewers

The Aten Sewage Disposal System consists essentially of a septic tank and filtration fields or leaching chambers. A diverting gate, siphon, special fittings and special tile are features promoting automatic and efficient operation.

We contract for the complete installation of our systems, or we can furnish necessary parts (septic tank fittings, metal forms for crowned roofs and reinforced wire forms for concrete work, cast iron manhole collars and covers, siphons, diverting gates, special "Y" branches for tile lines, and special horse-shoe tile) for installation by common labor.

TRADE-MARK

Principles of Sewage Disposal

For systems adapted to individual buildings or groups of buildings the greatest efficiency is attained by settling and digesting the solids in septic tanks and disposing of the sewage effluent from these tanks by filtration through the ground by means of percolation tile drains, leaching chambers or filter beds.

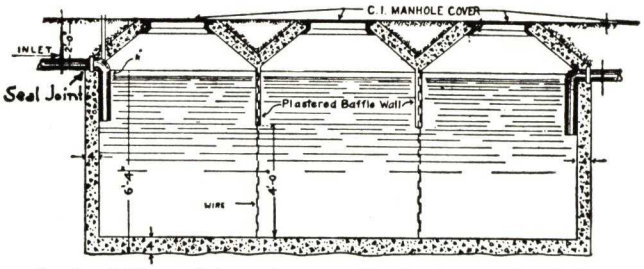
Septic Tank

The Aten Septic Tank consists of an airtight reinforced concrete chamber which receives the sewage, and settles and digests the solids by bacterial action. No chemicals used.

No Wooden Forms Required—After many years of experience and experimentation, we designed a reinforced wire form by means of which a concrete tank can be poured in position without the use of wooden forms. The Aten wire form is embedded and remains in the concrete, thus reinforcing it. This form saves about half the cost of concrete because thinner walls are used; it saves the cost of wooden forms and the time of a carpenter to erect and to take them down.

Filtration Field

The Filtration Field consists of at least two sets of tile lines, especially designed to allow air to reach the sewage and to insure uniform seepage to the soil. A diverting gate permits one set of lines to "rest" while the other is in operation.



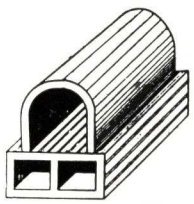
Sectional View of Aten Concrete Septic Tanks in Multiple

Aten single septic tanks can be furnished with capacities from 550 to 2500 gal. For schools, camps, clubs and factories where greater capacities are required septic tanks are installed in multiple, as shown above

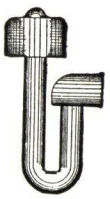
Leaching Chambers

Leaching Chambers are used where land is not available for tile fields. Two or more are used for each septic tank so that one chamber may "rest" while the other is in operation. Constructed of stone, brick, or hollow building block.

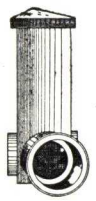
Special Y Branch



Aten Double Tile



Siphon



Diverting Gate

EXPERIENCE

The Company has had more than twenty years' active work in design and construction. The Engineering Staff is qualified through training and experience in sanitary and civil engineering to ably meet all conditions.

A FEW ATEN INSTALLATIONS

W. K. Vanderbilt, Centerport, N. Y.
Piping Rock Club, Locust Valley, N. Y.
Engineers Club, Roslyn, N. Y.
Canada Dry Ginger Ale Factory, Hudson, N. Y.
E. D. Morgan, Wheatly Hills, N. Y.
Thomas Hastings (Carrere & Hastings), Westbury, N. Y.
New and Old High Schools and Three Grade Schools, Oceanside, N. Y.
Cheney Bros. Hospital, South Manchester, Conn.
Nelson Doubleday, Oyster Bay, N. Y.
Dan Beard Outdoor School, Pike County, Pa.
Camp Pol-O-Moonshine, Willsborough, N. Y.
Four Grade Schools, Lynbrook, N. Y.
Department of Parks, New York, N. Y.
Florida East Coast Railways, New Smyrna, Fla.
Montauk Beach Development Corp., Montauk, N. Y.
Four Grade Schools, Valley Stream, N. Y.
Two Grade Schools, Rockville Center, N. Y.
Mrs. C. R. Holms, Port Washington, N. Y.
Chateau Apartments, Woodmere, N. Y.
Isolation Hospital, Perth Amboy, N. J.
Eddie Cantor, Great Neck, N. Y.
Milton L'Ecluse, Huntington, N. Y.
W. C. Langley, Old Westbury, N. Y.
Carbondale Machinery Co., Carbondale, Pa.
High and Grade Schools, Mineola, N. Y.
Central School, Pine Plains, N. Y.
Salisbury Golf Club, Garden City, N. Y.
Salisbury Country Club, Garden City, N. Y.
S. A. Lewisohn, Harrison, N. Y.
John W. Weber, Shelter Island, N. Y.
Camp Dudley, Westport, N. Y.
High School and Two Grade Schools, Westbury, N. Y.
A. H. Wyatt, Prop., Huellets-on-Lake George, N. Y.
Leake & Watts Orphan House, Tivoli, N. Y.
Cherry Lawn School, Darien, Conn.
Vincent Riggio, Chappaqua, N. Y.
High and Grade School, Bridgehampton, N. Y.
Evangeline Booth, Hartsdale, N. Y.
Supplee Wills Jones Dairy, Woodstown, N. J.
Queen of the Rosary Convent, Amityville, N. Y.
Two Grade Schools, Smithtown, N. Y.
Ieuan Harris, Salisbury, Conn.
Glen Oaks Country Club, Great Neck, N. Y.
Smithtown Theatre, Smithtown, N. Y.
Scanlan Gardens Apartments, Cedarhurst, N. Y.
Cooke Milk & Cream Co., Central Square, N. Y.
Nazareth Trade School, Farmingdale, N. Y.
Delaware County Hospital, Delhi, N. Y.
Sewanhaka High School and Two Grade Schools, Floral Park, N. Y.
Dr. Frederick Prime, Huntington and Shelter Island, N. Y.
St. Joseph's Novitiate, Metuchen, N. J.
Home for the Aged, Hempstead, N. Y.
Dr. Wesley Bowers, Southampton, N. Y.
Col. Henry Du Pont, Wilmington, Del.
Henry A. Colgate, Morristown, N. J.
The Dry Milk Company, Jasper, Mo.
Workman's Circle Camp, Sylvan Lake, N. Y.
Westchester Yacht Club, Mamaroneck, N. Y.
Deepdale Golf Club, Great Neck, N. Y.

KAUSTINE COMPANY, INC.

Engineers and Manufacturers of Sewage Disposal Equipment

Main Office and Factory, PERRY, N. Y.

Consult Telephone Directory for Local Offices

PRODUCTS AND ENGINEERING SERVICE

Kaustine Armco Ingot Iron Septic Tanks, Kaustine Super-Septic Tanks, Kaustine System Septic and Chemical Toilets, Kaustine Automatic Syphons, Kaustine Sewage Ejectors, Kaustine Multiple Distribution Chambers, Kaustine E-Z Drain Tile Connectors, Kaustine Grease Separators, Kaustine Chemicals.

Kaustine TRADE MARK

Kaustine Products are endorsed by Public Health Authorities.

With its corps of engineers at the home office and in the field, KAUSTINE COMPANY, INC., can adequately cope with *all* problems relating to sewage disposal. Architects using this service are relieved of the details of sewage treatment plant design and installation. Simply state the requirements of the particular job. KAUSTINE COMPANY, INC., will furnish all of the necessary plans and specifications, without cost or obligation.

Literature, containing valuable information respecting the various types of appurtenances which go to make up complete sewage treatment plants, as well as plans showing unusual installations, is available on request.

KAUSTINE STANDARD SERIES SEPTIC TANKS

Vertical Septic Tank

These tanks are made in two types. The vertical types (Nos. 62, 63 and 65) are designed for homes and small institutions. The horizontal types (Nos. 85, 810, etc.) are designed for use where larger capacities are required. All are constructed throughout of Armco Ingot Iron, which is noted for its rust-resisting qualities, and are coated inside and out with plastic enamel, which provides additional protection against corrosion.

The vertical tanks are made in 200, 300 and 490-gal. sizes, and are equipped with a removable cover. The horizontal tanks are made in capacities up to 5000 gals. and are provided with two or three manholes, according to size. The manhole covers are securely bolted to the tank sleeve with brass nuts, which eliminates corrosion at this point. This type of cover is easy to remove and insures quick access to the interior of the tank whenever necessary.

The internal design of Kaustine Tanks is unique. Baffle plates are placed at the intake and discharge openings and a sludge baffle is placed near the outlet. This construction utilizes the entire capacity of the tank, yet will not allow either the scum on the top or the sludge at the bottom to be discharged.

In addition to the special features noted above, attention is called to the new sizes and changes of gauges of metal shown in the table below. Information on tanks of larger capacities of the circular type and a free booklet describing installation methods will be furnished on request.

Horizontal Septic Tank

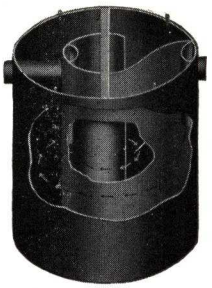
SPECIFICATIONS—STANDARD SERIES

No.	Total cap., gal.	Net working capacity, gal.	Number of people: *Home or Institution	Number of people: School	Number of people: Factory	Dimensions	Tile conn. accommodates	Gauge	Shipping wgt., lbs.
Vertical Tanks									
62	245	200	Up to 6	15	12	38″ dia. x 48″	4″ or 6″	14	220
63	345	300	6 to 9	25	20	46″ dia. x 48″	4″ or 6″	14	285
65	550	490	10 to 18	40	35	52″ dia. x 60″	4″ or 6″	14	390
Horizontal Tanks									
85	550	500	10 to 20	40	35	52″ dia. x 60″	4″ or 6″	14	415
810	1150	1000	20 to 40	80	70	52″ dia. x 10′	4″ or 6″	12	825
815	1675	1500	40 to 75	120	105	65″ dia. x 9′6″	4″ or 6″	12	1130
820	2250	2000	75 to 100	165	140	6′ dia. x 10′8″	6″ or 8″	3/16″	2270
825	2790	2500	100 to 125	210	175	6′ dia. x 13′2″	6″ or 8″	3/16″	2675
830	3350	3000	125 to 150	250	200	6′ dia. x 15′10″	6″ or 8″	3/16″	3095
835	3915	3500	140 to 175	290	235	6′ dia. x 18′6″	6″ or 8″	3/16″	3525
840	4475	4000	160 to 200	330	270	6′ dia. x 21′2″	6″ or 8″	3/16″	3945
845	5065	4500	180 to 225	370	305	6′ dia. x 23′10″	6″ or 8″	3/16″	4395
850	5550	5000	200 to 250	410	340	6′ dia. x 26′4″	6″ or 8″	3/16″	4800
845H	4900	4500	180 to 225	370	305	7′6″ dia. x 14′10″	6″ or 8″	1/4″	5365
850H	5450	5000	200 to 250	410	340	7′6″ dia. x 16′6″	6″ or 8″	1/4″	5790

*Lower figures in home ratings column are recommended by health officials for most satisfactory service. In no instance, even for temporary use, should maximum ratings shown be exceeded.

KAUSTINE SUPER-SEPTIC TANKS

Exterior View



Interior View

Vertical Model—Kaustine Vertical Super-Septic Tanks, available in sizes from 200 to 1500 gals. capacity, are equipped with a patented internal baffle which insures an effluent of the highest quality. The special interior construction prevents the discharge of unsettled sewage when a sudden inrush occurs. Dead areas within the tank are eliminated, which permits a uniform rate of flow of the sewage from inlet to outlet. These features result in a more equitable distribution of sludge in the bottom of the tank, with a more effective bacterial digestion and consequent reduction of sludge volume and a clearer effluent. All Kaustine Super-Septic Tanks are constructed throughout of rust-resisting Armco Ingot Iron and are coated inside and outside with black plastic enamel.

Horizontal Model—Kaustine Horizontal Super-Septic Tanks, available in size from 2250 to 19,800 gals. capacity, are designed to provide economical and effective single tank installations for schools, institutions, etc. Sloping baffles discharge the incoming flow over the entire width of the tank, with no disturbance of sludge and outlet baffles prevent discharge of scum into the disposal field. The tanks are specially shaped to allow for ample sludge, scum and gas areas. Data on special installations furnished on request.

Horizontal Super-Septic Tank

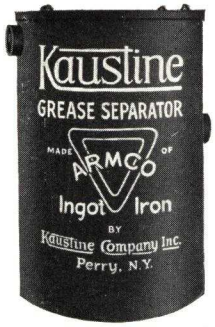
VERTICAL SUPER-SEPTIC TANK SPECIFICATIONS

Cat. No.	Dimensions	Total capacity, gal.	Working capacity, gal.	Number of Persons Designed to Accommodate: Home	Hotel	Factory	School	Approximate shipping wgt., lbs.
112	38″x50″	245	200	7	9	12	15	280
113	48″x50″	390	320	10	12	20	25	360
114	55″x60″	615	535	15-20	30	40	45	800
115	65″x60″	860	735	20-35	40	50	55	1290
116	75″x60″	1150	1000	35-45	60	70	85	1650
117	92″x60″	1700	1500	45-80	90	110	150	1950

HORIZONTAL SUPER-SEPTIC TANK SPECIFICATIONS—STANDARD SIZES

Cat. No.	Capacity, gal.	Length	Height	Width	Thickness of metal	Weight, lbs.: 3/16″	Weight, lbs.: 1/4″
S2250	2250	8′ 4″	7′ 0″	7′ 4″	3/16″ or 1/4″	3600	4300
S2800	2800	10′ 5″	7′ 0″	7′ 4″	3/16″ or 1/4″	4000	4900
S3400	3400	12′ 6″	7′ 0″	7′ 4″	3/16″ or 1/4″	4400	5600
S4000	4000	14′ 10″	7′ 0″	7′ 4″	3/16″ or 1/4″	4900	6300
S4600	4600	16′ 8″	7′ 0″	7′ 4″	3/16″ or 1/4″	5400	6800
S5200	5200	18′ 9″	7′ 0″	7′ 4″	3/16″ or 1/4″	5900	7500
S5800	5800	12′ 6″	9′ 9″	8′ 0″	3/16″ or 1/4″	6500	7400
S7800	7800	16′ 8″	9′ 9″	8′ 0″	3/16″ or 1/4″	7800	9000
S9800	9800	20′ 10″	9′ 9″	8′ 0″	3/16″ or 1/4″	9100	10500
S11800	11800	25′ 0″	9′ 9″	8′ 0″	3/16″ or 1/4″	10400	12100
S13800	13800	29′ 2″	9′ 9″	8′ 0″	3/16″ or 1/4″	11700	13700
S15800	15800	33′ 4″	9′ 9″	8′ 0″	3/16″ or 1/4″	13000	15300
S17800	17800	37′ 6″	9′ 9″	8′ 0″	3/16″ or 1/4″	14400	16900
S19800	19800	41′ 8″	9′ 9″	8′ 0″	3/16″ or 1/4″	16400	21100

KAUSTINE GREASE SEPARATOR



Grease Separator

The Kaustine Grease Separator is designed for use where large amounts of greasy wastes are discharged into the sewage system. Grease prevents proper bacterial action in the septic tank and, in addition, because of its lighter specific gravity when it is discharged into the absorption bed, rapidly clogs up the pores of the earth.

The separator is built of Armco Ingot Iron, with electrically welded seams. The removable cover is securely held in place by brass nuts, a construction which permits of easy access to the interior for cleaning and skimming. The baffles are arranged to provide for the maximum amount of grease and lighter floating solids and yet for the complete removal of the heavier solids. This prevents the possibility of putrefying organic matter from being held at the bottom of the unit. Generous capacities insure rapid coagulation of the grease. If separators of larger capacities than those listed below are required, full information and prices will be gladly furnished on request.

SPECIFICATIONS—KAUSTINE GREASE SEPARATOR

No.	Total gals.	Dimensions, in.		Connection, in.		Weight, lbs. (approx.)
		Dia.	Depth	Inlet	Outlet	
253	40	22	25	2	2	60
254	60	22	36	2	2	85
256	150	32	50	3	3	180

KAUSTINE SYPHON AND SYPHON COMPARTMENT

The Kaustine Syphon Compartment with automatic syphon is designed to receive and retain the effluent until the compartment becomes filled. This gives the absorption bed an opportunity to rest and dry out between dosings. The action of the syphon in discharging the contents of the compartment is entirely automatic.

Syphon and Syphon Compartment

The syphon compartment with syphon is built as a separate unit from the septic tank to permit of installation at the most advantageous point. Like all Kaustine products, the Kaustine Syphon Compartment is made of Armco Ingot Iron. The syphon is heavy cast iron.

SPECIFICATIONS—KAUSTINE SYPHON COMPARTMENT WITH SYPHON

Catalog No.	Dimensions, in.	Capacity, gals.	For use with Septic Tank Numbers	Connection, in.	Syphon outlet, in.	Discharge per min., gals.	Weight, lbs.
151	32x25	50	62, 63	4	3	90	210
152	48x25	110	65, 85, 810, 815	4	3	90	315
153	65x25	220	820, 825, 830	4	3	90	520
*153-D	65x25	220	820, 825, 830	4	3	90	590
154	80x25	330	835, 840	4	3	90	800
*154-D	80x25	330	835, 840	4	3	90	870
155	96x25	440	845, 850	4	3	90	1000
*155-D	96x25	440	845, 850	4	3	90	1070

*These are duplex syphon compartments equipped with two syphons which operate alternately. Each syphon outlet can be connected to a separate tile field and as they work alternately each tile field receives double the rest period. The duplex compartments are recommended particularly for heavy clay soils where drainage is slow.

KAUSTINE SYSTEMS FOR USE WHERE RUNNING WATER IS NOT AVAILABLE

Where running water and public sewage systems are not available, Kaustine chemical toilets or Kaustine septic type toilets that operate without chemical should be used.

Write our main office at Perry, N. Y., of your problem. Engineering service will be furnished promptly.

KAUSTINE SEPTIC TANK, SYPHON AND SYPHON COMPARTMENT COMBINATIONS

To make it convenient to order Kaustine Septic Tanks with the proper syphon and syphon compartment for the capacity septic tank required, various combinations are listed below. Each syphon and syphon compartment is a separate unit, designed for its special purpose. The septic tank provides proper digestion of the sewage and the syphon compartment with syphon provides periodical dosings of the field.

SPECIFICATIONS—KAUSTINE SEPTIC TANKS WITH SYPHON AND SYPHON COMPARTMENTS

Catalog No.	Total capacity, gals.	Syphon discharge per min., gals.	Approx. shipping weight, lbs.
62-151	250	90	430
63-151	350	90	495
65-152	610	90	705
85-152	610	90	730
810-152	1110	90	1140
815-152	1610	90	1445
820-153	2220	90	2840
825-153	2720	90	3290
830-153	3220	90	3695
835-154	3830	90	4380
840-154	4330	90	4800
845-155	4940	90	5395
850-155	5440	90	5800
Kaustine Super-Septic Tanks with Syphon and Syphon Compartments			
112-151	250	90	490
113-151	370	90	570
114-152	645	90	1115
115-152	845	90	1605
116-152	1100	90	1965
117-152	1610	90	2265

Note: If duplex syphon compartments equipped with two syphons are wanted with any of the above combinations, place the letter D after the number. For instance, the 3000-gal. tank with duplex compartment would be No. 830-153-D.

KAUSTINE SEWAGE EJECTORS

Sewage Ejector

The Kaustine Sewage Ejector is a device for pumping the effluent from the tank to the absorption bed on installation where the contour of the grounds is such that a gravitational flow is not possible. It consists of an electrically driven pump, placed in an Armco Ingot Iron tank. The pump, which is specially designed for sewage work, is controlled by an automatic float switch. It is mechanically perfect in design, noiseless in operation and can be installed anywhere. The table below shows the units in single and duplex arrangement. The single unit is satisfactory for a home or small plant. For a public or semi-public installation, however, a duplex unit is recommended. Kaustine Engineers will be glad to consult with you regarding the size and type ejector required.

Single Unit		Double Unit	
Tank size, in.	Capacity, gals.	Tank size, in.	Capacity, gals.
32x50	120	55x60	470
38x50	170	65x60	660
48x50	275	75x60	870

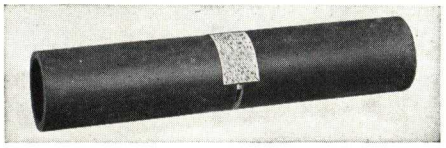
Multiple Absorption Bed Distribution Chambers

The KAUSTINE COMPANY, INC., has designed a series of multiple absorption bed distribution chambers to provide for a more equitable distribution of the effluent over the entire absorption bed area. These chambers are made of Armco Ingot Iron and have from 2 to 8 outlets, placed on the same elevation from which the effluent is simultaneously discharged into the absorption bed area. This prevents overworking the area adjacent to the tank. The chamber may, under certain conditions, be placed to permit the distribution of the effluent in the center of the absorption bed area, eliminating the long runs of tile that would otherwise be necessary.

An 8-Way Distribution Chamber

KAUSTINE TILE CONNECTORS

Kaustine E-Z Drain Tile Connectors are recommended for the installation of absorption bed tile. Their use insures perfect alignment and even spacing of the tiles, and as they are made of heavy, galvanized iron, they are practically indestructible. The connectors are made in two styles, illustrated below.



Style No. 1

Style No. 1 is used where gravel lines bottom of trench and where backfilled soil is firm. Upper half of joint is covered, sealing joint effectively against fillins or earth dams. Lugs on either side go inside the tile and insure proper spacing, are easily bent with the fingers and readily inserted in tile end. Style No. 1 is regularly furnished for 4-in. tile. Connectors for 5 and 6-in. tile can be furnished on request.

Style No. 2

Style No. 2 is designed for installations in sandy, open soil. This type extends entirely around the tile, forming a strong collar which holds tile ends securely in place. Bottom half is slotted and spacing of tile is automatic. Lugs are adjustable, permitting easy adaptation of the connector to any style of tile manufactured and to any irregularities in tile itself. Furnished only for 4-in. tile.

TYPICAL SPECIFICATIONS FOR KAUSTINE EQUIPMENT

The following is offered as a guide for the preparation of specifications covering installation for Kaustine Septic Tanks. The information outlined is essential for obtaining the best material and proper design and to enable contractor and manufacturer to figure prices accurately. These outlines are not intended to describe in detail. Tables and description of the various items as given will enable the specification writer to elaborate the specifications if he so desires. Catalog numbers, dimensions and capacities of tanks, and gauges of metal, are shown in the various tables.

Kaustine Armco Ingot Iron Septic Tanks

Vertical Type—Contractor shall furnish and install a No. ..... Kaustine Armco Ingot Iron Septic Tank to be constructed of 14-gauge pure iron having the following analysis: "carbon, manganese, phosphorus, sulphur and silicon, shall average a total of .06% and a maximum of .10%." Tank to be of ..... gallons net working capacity, and of following dimensions ..... Tank shall be equipped with inlet and outlet connections suitable to accommodate 4 or 6 in. standard pipe or tile. Inlet and outlet connections shall be provided with tile stops. Tank to be electrically welded throughout and to be provided with removable covers held in place with four bolts with brass nuts. Tank shall be coated inside and outside with black plastic enamel applied by the hot dip process.

Kaustine Super-Septic Armco Ingot Iron Tanks

Vertical Type—Contractor shall furnish and install a No. ..... Kaustine Super-Septic Armco Ingot Iron Tank to be constructed of ..... gauge pure iron having the following analysis: "carbon, manganese, phosphorus, sulphur and silicon, shall average a total of .06% and a maximum of .10%." Tank to be of ..... gallons net working capacity and of following dimensions ..... Tank shall be equipped with special Kaustine Super-Septic type circular baffle and inlet and outlet baffles. Tank shall have inlet and outlet connections, suitable to accommodate 4 or 6-in. standard pipe or tile. Inlet and outlet connections shall be provided with tile stops. Tank to be electrically welded throughout and to be provided with removable covers held in place with four bolts with brass nuts and in addition, to have a 14-in. diameter manhole with cover. Tank shall be coated inside and outside with black plastic enamel applied by the hot dip process.

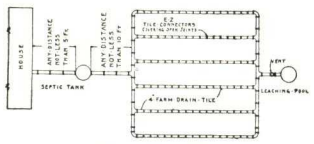
Cylindrical Horizontal Type—Contractor shall furnish and install a No. ..... Kaustine Armco Ingot Iron Septic Tank to be constructed of ..... gauge pure iron having the following analysis: "carbon, manganese, phosphorus, sulphur and silicon, shall average a total of .06% and a maximum of .10%." Tank to be of ..... gallons net working capacity and of following dimensions ..... Tank shall be equipped with inlet, outlet and sludge deposition baffles of standard Kaustine design and with inlet and outlet connection to take .... size standard pipe or tile. Inlet and outlet connections shall be provided with tile stops. Tank shall be equipped with ..... number of 18-in. diameter manholes with covers held in place with bolts with brass nuts. Tank shall be coated inside and outside with black plastic enamel applied hot.

Horizontal Type—Contractor shall furnish and install a No. ..... Kaustine Armco Ingot Iron Super-Septic Tank to be constructed of .... inch pure iron having following analysis: "carbon, manganese, phosphorus, sulphur and silicon, shall average a total of .06% and a maximum of .10%." Tank to be of ..... gallons net working capacity and of the following dimensions: Length ....., width ....., height ..... Tank shall be U-shaped in form, providing a hemispherical bottom and flat top. Tank shall be equipped with three 18-in. diameter manholes with covers securely held in place with bolts with brass nuts. Tank to have inlet and outlet baffles and specially designed sloping baffles and sludge deposition baffles. Inlet and outlet connection shall be ..... inches in diameter and shall be provided with tile stops. Tank shall be coated inside and outside with black plastic enamel applied hot.

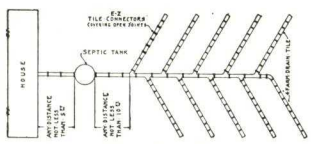
Tile or Drainage Field

Contractor shall install a drainage field in accordance with the plans. Field shall consist of .... feet of 4-in. farm drain tile laid with open joints, each joint connected with Kaustine E-Z Drain Tile Connectors, style ..... Layout of tile field, size of trenches, gravel fill, etc. shall be as shown on the plans.

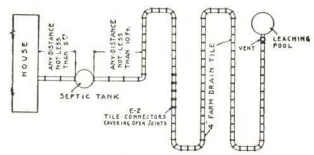
SIMPLE INSTALLATION PLANS



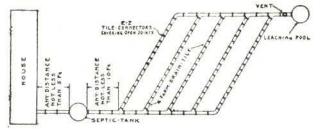
Plan No. 10



Plan No. 11



Plan No. 12



Plan No. 13

Plan No. 10 shows type of installation which provides best distribution and assures proper aeration of effluent. Where soil is semi-porous, leaching pool may be eliminated. If soil is clay a leaching pool size of tank should be provided. *Plan No. 11* should be used only where soil is porous, will readily absorb effluent and where plenty of room is available. *Plan No. 12* should be used where sewage installation is on a hillside, or where ground slopes steeply. Absorption bed is laid in long lines as indicated, practically level around the hill. Short lines carry effluent from one level to next one below. *Plan No. 13* may be used with either porous or non-porous soils. In porous soils leaching pool may be eliminated; in non-porous soils same leaching pool as recommended in Plan No. 10 should be used. In either case, a vent should be provided, as indicated.

INSTALLATION INSTRUCTIONS

Wherever possible do not install septic tank deeper than from 12 to 18 in. underground. Connect tank with absorption bed by means of bell and spigot pipe laid with cemented joints. Grade of the line from house to tank and from tank to bed should be ¼ in. per ft.

In porous soils place a layer of gravel from 8 to 12-in. depth under tile lines in absorption bed. In tight soils increase depth of gravel proportionately.

Drainage from septic tanks should be well removed and away from sources of water supply, such as wells and springs. Sufficient drainage area is necessary for successful operation of the septic tank. Amount of tile should be liberal.

Absorption bed should not be more than 2 ft. beneath surface of ground and, where surface conditions permit, depths of from 9 to 12 in. are more desirable. Slope of lines in absorption bed should not be more than 3 ft. in 100 ft.

Where conditions do not permit installation of tank according to these requirements consult our Engineering Department, sending full particulars. A request for this engineering service will place you under no obligation.

Daily Capacities of Septic Tanks—For single house, 30 gals. per capita; for schools, 10 to 12 gals. per pupil; for institutions and villages, 50 gals. per capita.

Depth Underground—For most climates, Kaustine Septic Tanks should be placed 12 in. underground. In colder climates greater depth is recommended.

Grading of Sewer and Tile Lines—From house to tank not less than ¼ in. drop per ft. From tank to absorption bed not to exceed ⅜ in. per ft. Lines in absorption bed, in extremely porous soil, never on grade steeper than 6 in. per 100 ft. In heavier soil, 2 in. per 100 ft. is recommended.

Absorption Bed Material—4-in. farm drain tile, joined with Kaustine E-Z Drain Tile Connectors is satisfactory.

Depth Underground of Absorption Tile—In most climates, 12 in. is satisfactory. In colder climates, depths up to 30 in. may be used. The closer absorption tile is kept to the surface, the quicker the effluent will receive its necessary supply of oxygen.

SAN-EQUIP INC.

Manufacturers of Complete Septic Sewage Disposal Systems

SYRACUSE, N. Y.

FACTORY REPRESENTATIVES

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BIRMINGHAM, ALA., W. T. Mayfield Co., 1409 Webb-Crawford Bldg.
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BROOKLYN, N. Y., F. Seeley, 1747 58th St.
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ST. PAUL, MINN., Wm. McNamara, 2694 University Ave.
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SYRACUSE, N. Y., H. D. Carey, 605 Beech St.

Distributors Are Leading Plumbing Supply Jobbers—Warehouse Service at Principal Cities

Products

San-Equip Horizontal Septic Tanks—For schools, factories, hotels, parks, etc.

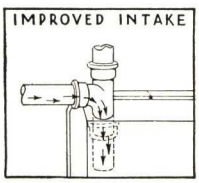
San-Equip Siphon Septic Tanks—Combining treatment tank with siphon discharge.

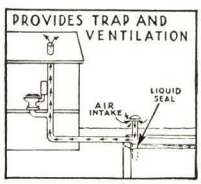
San-Equip Master Septic Tanks—An improved disposal service for homes and camps.

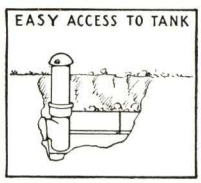
San-Equip Drain Pools and Filter Pipe—For more efficient septic system drainage.

Construction

For many years San-Equip Septic Tanks have been recognized by architects, engineers and health officials as standard equipment for unsewered areas. Designs follow the best sanitary engineering practice. Improved construction insures maximum durability. All tanks are made of special copper-bearing iron with welded seams. In addition, they are heavily coated with mineral asphalt to protect against the corrosive action of moisture and acids.





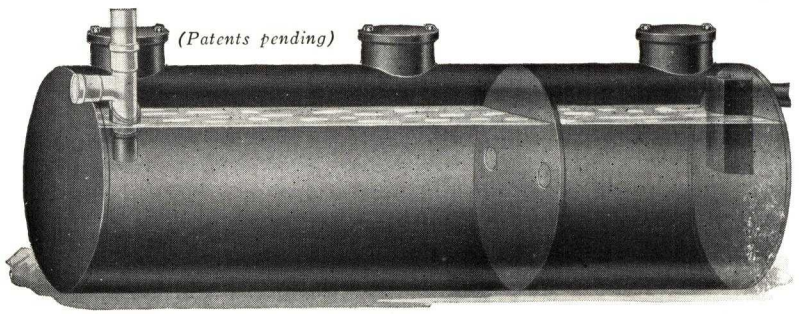


Improved Features

An important improvement in septic tank design is the new San-Equip top intake. By permitting sewage to enter the tank more rapidly it tends to keep the baffle clear and reduce the possibility of clogging. In addition, this new type of intake extends above the ground to serve as a fresh air intake to the house stack. No other trap or vent is required—the liquid seal below liquid level in the tank seals the line against escaping gases.

This improved feature also simplifies installation and servicing. The tank itself can be set at any angle to the house line by turning the T fitting—an advantage where space available is limited. Tank location is marked by the extension above ground and, if ever necessary, provides access to the intake baffle without digging. Intake opening in the tank itself is designed to take standard cast iron or tile sanitary T fitting.

SAN-EQUIP HORIZONTAL SEPTIC TANKS



Phantom View of Horizontal Septic Tank Showing Improved Top Intake and Partition Dividing Tank into Separate Sludge and Effluent Chambers

Septic tanks of 500 gallons capacity and up for schools, factories, parks, hotels, etc., are horizontal type as shown at the left. A full partition divides the tank into separate sludge and effluent chambers to insure thorough digestion and settling out of solids from large quantities of sewage. A safer effluent results with less suspended solids passing into the drainage field. Nos. 905 to 925 have two manholes—larger sizes have three. Electrically welded seams insure the permanent water-tight construction required for these systems.

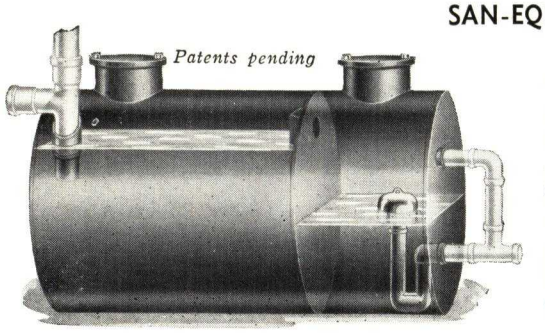
*SIZES AND RATINGS OF HORIZONTAL TANKS

No.	Total capacity gallons	Working capacity gallons	No. of people			Dia.	Length	Gauge	Size of openings	Shipping weight pounds
			*Home	School	Factory					
905	550	500	10 to 20	40	35	52″	5′	14	4″	425
910	1150	1000	20 to 40	80	70	52″	10′	12	6″	925
915	1725	1500	40 to 75	120	105	52″	15′	12	6″	1300
920	2300	2000	75 to 100	165	140	68″	11′8″	3/16″	6″	2400
925	2875	2500	100 to 125	210	175	68″	14′7″	3/16″	6″	2850
930	3450	3000	120 to 150	250	200	68″	17′6″	3/16″	8″	3300
935	4025	3500	140 to 175	290	235	68″	20′5″	3/16″	8″	3750
940	4600	4000	160 to 200	330	270	68″	23′4″	3/16″	8″	4200
945	5175	4500	180 to 225	370	305	68″	26′3″	3/16″	8″	4650
950	5750	5000	200 to 250	410	340	68″	29′2″	3/16″	8″	5100

Specifications and installation plans for tanks to 10,000 gallons on request

*Ratings shown are maximum based on ordinary operating conditions. Local regulations governing capacities or ratings should be followed where such exist. In no case, even for temporary service should maximum ratings be exceeded.

SAN-EQUIP SIPHON SEPTIC TANKS



An improved horizontal type septic tank that combines treatment chamber and automatic siphon discharge in one compact unit. The siphon discharges at four to eight-hour intervals in sufficient volume to distribute the effluent throughout the entire filter bed. Every foot of the tile field receives its share of the drainage load. Periods of rest between discharges improve the absorption process and speed final disposal. Possibility of overloading or clogging is reduced. A full partition separates the treatment and siphon chambers. Siphon unit is cast iron. Nos. 703 to 720 have two manholes—larger sizes have three.

*SIZES AND RATINGS OF SIPHON SEPTIC TANKS

No.	Total capacity gal.	Siphon discharge gal.	No. of People			Dia.	Length	Gauge	Size of intake	Size of outlet	From Top of Tank to center of		Shipping weight lbs.
			*Home	School	Factory						Intake	Outlet	
703	360	60	7	15	12	48″	4′	14	4″	4″	5″	34″	400
705	550	80	12	25	20	52″	5′	14	4″	4″	5″	38″	495
707	828	120	25	50	40	52″	7′6″	14	4″	4″	5″	38″	595
710	1150	160	40	75	60	52″	10′	12	6″	4″	6″	38″	1025
715	1725	225	70	110	95	52″	15′	12	6″	4″	6″	38″	1375
720	2300	300	85	155	130	69″	11′8″	3/16″	6″	6″	6″	37″	2475
725	2875	375	115	200	170	69″	14′7″	3/16″	6″	6″	6″	37″	2975

Ask for blueprints of larger sizes to 10,000 gallons.

*Ratings shown are maximum based on ordinary operating conditions. Local regulations governing capacities or ratings should be followed where such exist. In no case, even for temporary service should maximum ratings be exceeded.

SAN-EQUIP "MASTER" SEPTIC TANKS

A horizontal type septic for the average home or camp with many features not found in the ordinary tank of this size. The longer flow of sewage within the tank permits more thorough digestion and settling out of solids. Recommended for general use where a dependable, trouble-free service is required.

*SIZES AND RATINGS OF "MASTER" TANKS

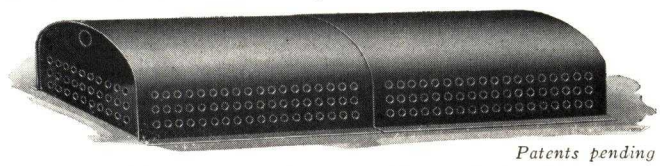
No.	Total capacity gallons	Working capacity gallons	No. of people			Dimensions			Shipping weight pounds
			*Home	School	Factory	Length	Width	Depth	
602	260	225	4 to 7	15	12	60″	26″	42″	255
603	375	335	7 to 10	25	20	60″	34″	48″	310

*Lower figures are recommended by health officials for most satisfactory service. In no instance should maximum ratings be exceeded.

SAN-EQUIP DRAINAGE

San-Equip Drain Pool

A correctly designed seepage pool that furnishes the most satisfactory drainage under average conditions. Perforations around the sides and ends, plus the open bottom provide a larger seepage area where soil conditions are best for final disposal.



Patents pending

No. 160DP—Single section pool 60″ long x 34″ wide x 19″ deep, for use with 200-gal. septics. Weight, 105 lbs.

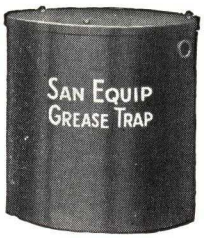
No. 250DP—Two section pool 96″ long x 34″ wide x 19″ deep, for use with 300-gal. septics. Weight, 173 lbs.

Waterless Toilet Systems

Where sanitary toilet equipment to operate without running water is desired, two types of San-Equip Systems are available. In one system the sewage is treated by bacteria process, in the other by chemical action. Complete catalog information on both types of equipment including sizes, ratings, etc., will be sent on request.

San-Equip Grease Trap

For use in hotels and restaurants or wherever the discharge of large amounts of grease and kitchen waste directly into the septic tank would tend to overload and clog the entire disposal system. Requires occasional skimming.



The grease trap is made of asphalt-coated, copper-bearing iron. Standard openings are 2-in. threaded couplings; 4-in. openings for tile or soil pipe connections can be furnished if specified. Available in two sizes as follows:

No. GT40—40-gal. size 22½″ diam. x 24″ deep, weight 61 lbs.
No. GT60—60-gal. size 22½″ diam. x 36″ deep, weight 79 lbs.
No. GT200—200-gal. size 38″ diam. x 48″ deep, weight 210 lbs.

Engineering Service

Additional information on San-Equip Sewage Disposal Systems will be furnished on request. Our Engineering Department is always available for assistance or advice with your particular disposal problems—without obligation. Write SAN-EQUIP INC., East Brighton and Glen Avenues, Syracuse, N. Y.

MEMORANDA

Established 1888

AMERICAN SEEP-PROOF

ROOF DRAINS

FLOOR DRAINS

GREASE TRAPS

WALL HYDRANTS

CLOSET SUPPORTS

BACK WATER TRAPS

DRINKING FOUNTAINS

SWIMMING POOL FITTINGS

American Foundry & Mfg. Co.
St. Louis, Mo.
Office and Factory, 1015 Hebert Street

AMERICAN SEEP-PROOF ROOF DRAINS

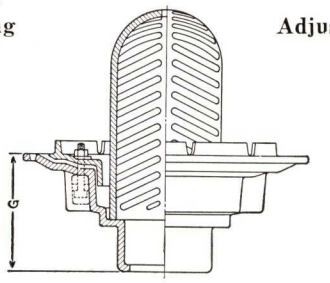
For Wood, Concrete, Gypsum, Precast Slab, Tile and Steel Decks,
Gravel, Slag, Tile or Smooth Surface Roofs

Cast Iron Body with Integral Flange—Anti-Tilting Dome Strainer Gravel Guard

Round Top Flange for Wood Deck
No. 1105 Bottom Outlet
No. 1111 Side Outlet

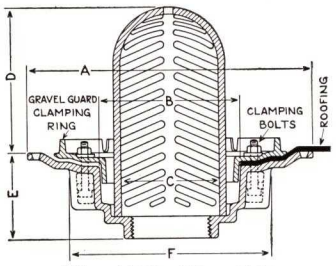
Water-Tight Clamping Ring

Bronze Adjustable Bolts

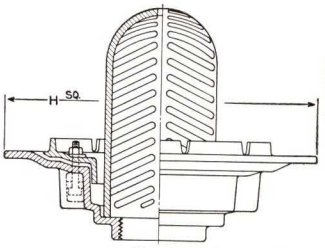


With Hub Outlet
For Inside Caulking

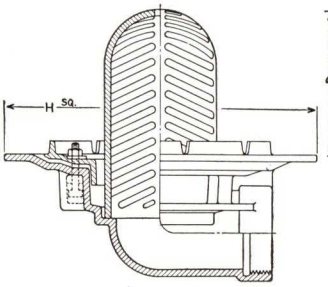
Round Top Flange for Concrete Deck
No. 1107 Bottom Outlet
No. 1113 Side Outlet

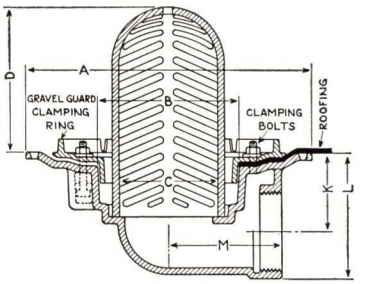


No. 1105—No. 1107
Dimensions



Square Top Flange For Wood Deck
No. 1109 Bottom Outlet No. 1115 Side Outlet





No. 1111—No. 1113
Dimensions

Dome Strainer Type—Bottom Outlet

Regularly furnished—Outlet Threaded Female Iron Pipe. Also furnished with Hub Outlet Inside Caulk when specified.

Specifications—Nos. 1005, 1107, 1109.
Dimensions are for Roughing In Only and may vary ¼ inch.

State Size Outlet	Size Top Flange	A Inches	B Inches	C Inches	D Inches	E Inches	F Inches	G Inches	H Inches	Round Top Flange No. 1105 or No. 1107 Black Cast Iron	Round Top Flange No. 1105 or No. 1107 Approx. Weight Pounds	Square Top Flange No. 1109 Black Cast Iron	Square Top Flange No. 1109 Approx. Weight Pounds
2″	16″	16	8	5½	8	5¼	11¾	6¾	17½	$16.00	47	$16.80	52
3″	16″	16	8	5½	8	5½	11¾	7	17½	16.00	47	16.80	52
4″	16″	16	8	5½	8	5½	11¾	7¼	17½	16.00	47	16.80	52
5″	18¼″	18¼	10¼	7½	8	5¾	14	7¼	19¾	19.50	73	20.50	80
6″	18¼″	18¼	10¼	7½	8	5¾	14	7¼	19¾	21.50	73	22.60	80
8″	20¼″	20¼	12¼	9½	8	6	15¾	7½	21¾	30.00	98	31.50	107

Dome Strainer Type—Side Outlet

Regularly furnished—Outlet Threaded Female Iron Pipe. Also furnished with Hub Outlet when specified.

Specifications—Nos. 1111, 1113, 1115.
Dimensions are for Roughing In Only and may vary ¼ inch.

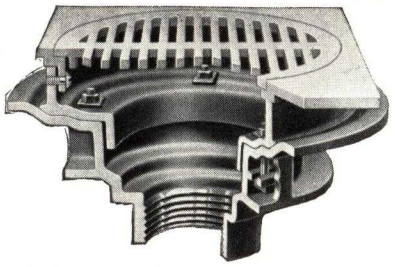
State Size Outlet	Size Top Flange	A Inches	B Inches	C Inches	D Inches	H Inches	K Inches	L Inches	M Inches	Round Top Flange No. 1111 or No. 1113 Black Cast Iron	Round Top Flange No. 1111 or No. 1113 Approx. Weight Pounds	Square Top Flange No. 1115 Black Cast Iron	Square Top Flange No. 1115 Approx. Weight Pounds
2″	16″	16	8	5½	8	17½	5	6¾	6½	$20.00	64	$20.80	69
3″	16″	16	8	5½	8	17½	4½	6¾	6½	20.00	64	20.80	69
4″	16″	16	8	5½	8	17½	4	6¾	6½	20.00	64	20.80	69
5″	18¼″	18¼	10¼	7½	8	19¾	5½	8¾	7½	24.40	90	25.30	97
6″	18¼″	18¼	10¼	7½	8	19¾	5	8¾	7½	26.90	90	27.90	97
8″	20¼″	20¼	12¼	9½	8	21¾	6½	11	8½	37.50	118	39.00	127

List Prices given are for Painted Cast Iron. Can be furnished Galvanized, All Cast Brass, or Combined Iron and Brass, when specified, at additional cost.

Dome Strainer with Opening in top to receive conductor pipe from a higher roof elevation can also be furnished when specified. The opening in the top is 2 inches less in diameter than outlet of drain.

AMERICAN SEEP-PROOF ROOF DRAINS

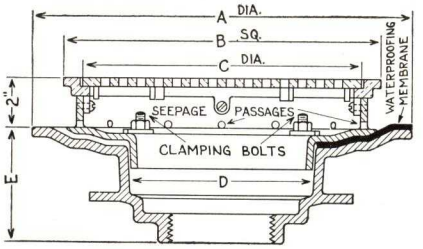
For Concrete, Gypsum, Precast Slab, Tile and Steel Decks,
Tile or Similar Surface Roofs



Square Top For Concrete Deck
No. 1121 Bottom Outlet

Cast Iron Body with Integral Flange
Anti-Tilting Grate—Promenade Deck Top

Water-Tight Clamping Ring — **Bronze Adjustable Bolts**



No. 1121 Dimensions

Promenade Deck Type—Bottom Outlet

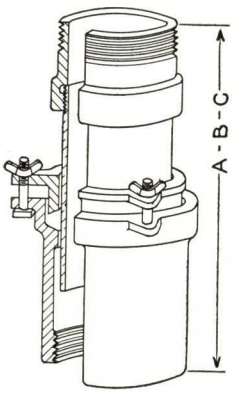
Regularly furnished—Outlet Threaded Female Iron Pipe. Also furnished with Hub Outlet Inside Caulk when specified.

SPECIFICATIONS—No. 1121.
Dimensions are for Roughing In Only and may vary ¼ inch.

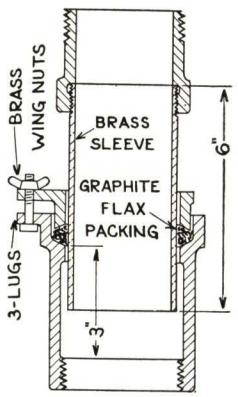
State Size Outlet	Size Deck Top	A Inches	B Inches	C Inches	D Inches	E Inches	Square Deck Top No. 1121 Black Cast Iron	Brass Top Black Body	Approx. Weight Pounds
2″	13¼″ x 13¼″	16	13¼	11¾	8	5¼	$20.00	$31.50	50
3″	13¼″ x 13¼″	16	13¼	11¾	8	5½	20.00	31.50	50
4″	13¼″ x 13¼″	16	13¼	11¾	8	5½	20.00	31.50	50
5″	15¼″ x 15¼″	18¼	15¼	13¾	10¼	5¾	24.50	39.00	71
6″	15¼″ x 15¼″	18¼	15¼	13¾	10¼	5¾	27.00	45.50	71
8″	17¼″ x 17¼″	20¼	17¼	15¾	12¼	6	36.00	55.00	91

List Prices given are for Painted Cast Iron and Combined Iron and Brass. Can be furnished Galvanized or All Cast Brass, also Chrom. Plated Finish or White Metal Top, when specified, at additional cost.

Promenade Deck Top above drain body regularly furnished 2 inches high, but can be furnished to meet various thicknesses of roof slabs when specified.



No. 1191



Sectional View

Expansion Joint Connection for Roof Drains

Cast Iron Body with Extra Heavy Brass Sleeve

Length of Travers 3 inches, permitting Expansion or Contraction of 1½ inches.

Size Outlet	No. 1191 Threaded Inlet Threaded Outlet A Inches	No. 1192 Threaded Inlet Spigot Outlet B Inches	No. 1193 Hub Inlet Spigot Outlet C Inches	Black Cast Iron	Galvanized Cast Iron	All Brass	Approx. Weight Pounds
2″	12	13	14¼	$ 5.50	$ 6.50	$ 9.00	9
3″	12	14¾	15¼	7.00	8.50	12.00	14
4″	12	15½	15¾	8.00	10.00	14.00	18
5″	12	15¾	16	11.00	13.50	18.00	24
6″	12	16¾	16½	13.00	16.00	22.00	31
8″	12	18	17¼	21.00	26.00	36.00	46

Dimensions are for Roughing In Only and may vary ¼ inch.

Integral Expansion Joint Type

Can be Repacked From Roof Level

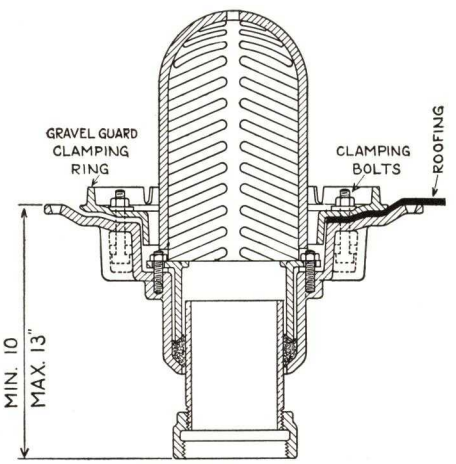
AMERICAN SEEP-PROOF Roof Drains with Bottom Outlet can be furnished with Integral Expansion Joints.

Roof Drains equipped in this manner eliminate access panels in ceiling suspended below roof level.

Expansion Joint contains all the principal features as detailed in Sectional View above with the exception that it can be Adjusted, Repacked and Removable Parts Replaced from the Top Side of the roof drain at roof level.

SPECIFICATIONS

Specify the Number of the Roof Drain and Add the Suffix I.E.J. which denotes that an Integral Expansion Joint is desired.



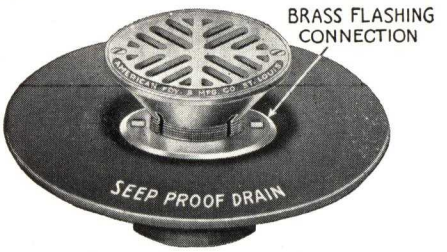
No. 1105 I.E.J.
No. 1105 Roof Drain equipped with Integral Expansion Joint

AMERICAN SEEP-PROOF ROOF DRAINS

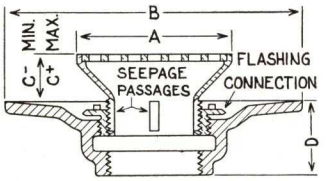
For Concrete, Tile Mosaic, Terrazzo, Mastic and other Composition Floors, Showers, Urinal Stalls, Gutters and Receptors.

Without Flashing Connection
No. 930 Bottom Outlet
No. 950 Side Outlet

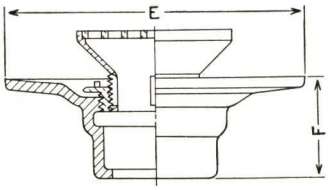
Cast Iron Body
Cast Brass Adjustable Head
with Removable Strainer



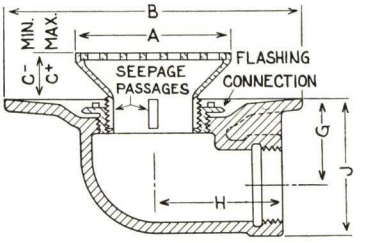
With Flashing Connection
No. 940 Bottom Outlet
No. 960 Side Outlet



No. 930—No. 940 Dimensions



With Hub Outlet for Inside Caulking



No. 950—No. 960 Dimensions

Plain Type—Bottom Outlet

Regularly furnished with Fig. 200 Strainer Head—Outlet Threaded Female Iron Pipe. Also furnished with Hub outlet inside Caulk when specified.

Specifications—Nos. 930, 940.
Dimensions are for Roughing In Only and may vary ¼ inch.

State Size Outlet	State Size Strainer	A Inches	B Inches	C— Inches	C+ Inches	D Inches	E Inches	F Inches	Without Flashing Connection, No. 930: Cast Iron Body, Pol. Br. or N. P. Strainer	Without Flashing Connection, No. 930: Approx. Weight, Pounds	With Flashing Connection, No. 940: Cast Iron Body, Pol. Br. or N. P. Strainer	With Flashing Connection, No. 940: Approx. Weight, Pounds
1½″	*4″	4½	10	1¼	2¼	2½	11	...	$ 6.50	6½	$ 7.50	7½
1½″	5″	5½	10	1¼	2¼	2½	11	...	7.50	7	8.50	8
1½″	6″	6½	10	1¼	2¼	2½	11	...	9.00	7½	10.00	8½
2″	*4″	4½	10	1¼	2¼	2½	11	4	6.50	6½	7.50	7½
2″	5″	5½	10	1¼	2¼	2½	11	4	7.50	7	8.50	8
2″	6″	6½	10	1¼	2¼	2½	11	4	9.00	7½	10.00	8½
3″	4″	4½	10	1¼	2¼	2¾	11	4¼	8.00	9	9.00	10
3″	*5″	5½	10	1¼	2¼	2¾	11	4¼	9.00	10	10.00	11
3″	6″	6½	10	1¼	2¼	2¾	11	4¼	10.50	10½	11.50	11½
3″	7″	7½	10	1¼	2¼	2¾	11	4¼	12.00	11½	13.00	12½
3″	8″	8½	10	1¼	2¼	2¾	11	4¼	13.50	12½	14.50	13½
4″	5″	5½	11	1¼	2¼	3	12	4½	10.00	13	11.00	14½
4″	*6″	6½	11	1¼	2¼	3	12	4½	11.50	13½	12.50	15
4″	7″	7½	11	1¼	2¼	3	12	4½	13.00	14½	14.00	16
4″	8″	8½	11	1¼	2¼	3	12	4½	14.50	15½	15.50	17
4″	10″	10½	11	1¼	2¼	3	12	4½	17.50	18	18.50	19½

Plain Type—Side Outlet

Regularly furnished with Fig. 200 Strainer Head—Outlet Threaded Female Iron Pipe. Also furnished with Hub Outlet when specified.

Specifications—Nos. 950, 960.
Dimensions are for Roughing In Only and may vary ¼ inch.

State Size Outlet	State Size Strainer	A Inches	B Inches	C— Inches	C+ Inches	G Inches	H Inches	J Inches	Without Flashing Connection, No. 950: Cast Iron Body, Pol. Br. or N. P. Strainer	Without Flashing Connection, No. 950: Approx. Weight, Pounds	With Flashing Connection, No. 960: Cast Iron Body, Pol. Br. or N. P Strainer	With Flashing Connection, No. 960: Approx. Weight, Pounds
1½″	*4″	4½	8½	1¼	2¼	2¾	3½	4	$ 8.00	10	$ 9.00	11
2″	*4″	4½	8½	1¼	2¼	2½	3½	4	8.00	10	9.00	11
3″	*5″	5½	10	1¼	2¼	3	4¼	5	11.00	12	12.00	13
3″	6″	6½	10	1¼	2¼	3	4¼	5	12.50	12½	13.50	13½
3″	7″	7½	10	1¼	2¼	3	4¼	5	14.00	13	15.00	14
4″	*6″	6½	11	1¼	2¼	3½	4¾	6	14.50	15	15.50	16
4″	7″	7½	11	1¼	2¼	3½	4¾	6	16.00	16	17.00	17

***Designates Size of Strainer regularly furnished unless otherwise specified. Strainer Heads can be furnished to fit all standard makes of receptors.**

Side Outlet Drains can also be furnished with various sizes of Strainers as shown in table for Bottom Outlet Drains.

List Prices given are for Plain Cast Iron Body. Can be furnished Galvanized, or All Cast Brass, also Chrom. Plated or White Metal Strainer Heads, when specified, at additional cost.

AMERICAN SEEP-PROOF FLOOR DRAINS

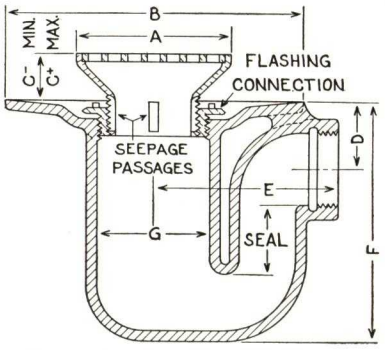
For Concrete, Tile, Mosaic, Terrazzo, Mastic and other Composition Floors, Showers, Urinal Stalls, Gutters and Receptors.

Without Flashing Connection
No. 934 Deep Pattern
No. 936 Shallow Pattern

Cast Iron Body
Cast Brass Adjustable Head with Removable Strainer

Water Seal
Deep Pattern 2½ Inches
Shallow Pattern 2 Inches

With Flashing Connection
No. 944 Deep Pattern
No. 946 Shallow Pattern



No. 934—No. 944 Dimensions

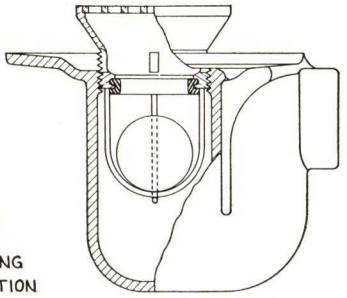


Fig. B. W.

With Removable Automatic Back Water Valve to prevent Waste Water from Backing up through Drain from Discharge Line.

Back Water Valve Consists of Copper Float operating agains a Brass and Rubber Seat within Brass Wire Cage.

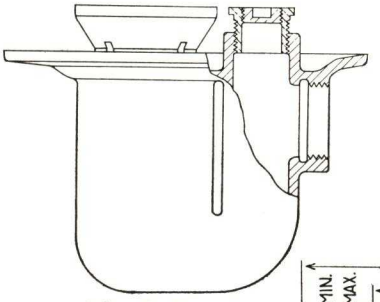
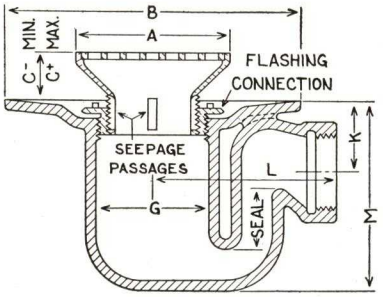


Fig. C. O.

With Cast Brass Cleanout to Floor on Outlet End of Trap. Cleanout opening consists of an Adjustable Brass Bushing to set flush with floor, having a Brass Cleanout Plug.



No. 936—No. 946 Dimensions

Drains Equipped with Back Water Valve—Cleanout to Floor on Outlet End of Trap at additional cost.

Combined Drain and Trap Type—Deep or Shallow Pattern

Regularly furnished with Fig. 200 Strainer Head—Outlet Threaded Female Iron Pipe. Also furnished with Hub Outlet when specified.

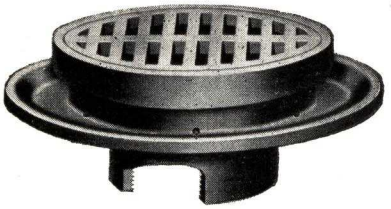
SPECIFICATIONS—Nos. 934, 936, 944, 946.
Dimensions are for Roughing In Only and may vary ¼ inch.

State Size Outlet	State Size Strainer	A Inches	B Inches	C— Inches	C+ Inches	D Inches	E Inches	F Inches	G Inches	K Inches	L Inches	M Inches	Without Flashing Connection No. 934 or No. 936 — Cast Iron Body, Pol. Br. or N. P. Strainer	Without Flashing Connection No. 934 or No. 936 — Approx. Weight Pounds	With Flashing Connection No. 944 or No. 946 — Cast Iron Body, Pol. Br. or N. P. Strainer	With Flashing Connection No. 944 or No. 946 — Approx. Weight Pounds
1½″	*4″	4½	10	1¼	2¼	1½	5½	6¾	4	2	6½	5½	$12.00	17	$13.00	17½
1½″	5″	5½	10	1¼	2¼	1½	5½	6¾	4	2	6½	5½	13.00	17½	14.00	18
1½″	6″	6½	10	1¼	2¼	1½	5½	6¾	4	2	6½	5½	14.50	18	15.50	18½
2″	*4″	4½	10	1¼	2¼	1¾	6	7½	4	1¾	6½	5½	12.00	18½	13.00	19½
2″	5″	5½	10	1¼	2¼	1¾	6	7½	4	1¾	6½	5½	13.00	19	14.00	20
2″	6″	6½	10	1¼	2¼	1¾	6	7½	4	1¾	6½	5½	14.50	19½	15.50	20½
3″	*5″	5½	10	1¼	2¼	2½	7½	9¼	4	2¼	8¼	6½	17.00	24½	18.00	25½
3″	6″	6½	10	1¼	2¼	2½	7½	9¼	4	2¼	8¼	6½	18.50	25	19.50	26
3″	7″	7½	10	1¼	2¼	2½	7½	9¼	4	2¼	8¼	6½	20.00	26	21.00	27
3″	8″	8½	10	1¼	2¼	2½	7½	9¼	4	2¼	8¼	6½	21.50	27	22.50	28
4″	5″	5½	11	1¼	2¼	3¼	10½	11	4	...	...	...	21.50	37½	22.50	39
4″	*6″	6½	11	1¼	2¼	3¼	10½	11	4	...	...	...	23.00	38	24.00	39½
4″	7″	7½	11	1¼	2¼	3¼	10½	11	4	...	...	...	24.50	38½	25.50	40
4″	8″	8½	11	1¼	2¼	3¼	10½	11	4	...	...	...	26.00	39½	27.00	41
4″	10″	10½	11	1¼	2¼	3¼	10½	11	4	...	...	...	29.00	42½	30.00	44

***Designates Size of Strainer regularly furnished unless otherwise specified. Strainer Heads can be furnished to fit all standard makes of receptors.**

List Prices given are for Plain Cast Iron Body. Can be furnished Galvanized or All Cast Brass, also Chrom. Plated or White Metal Strainer Heads, when specified, at additional cost.

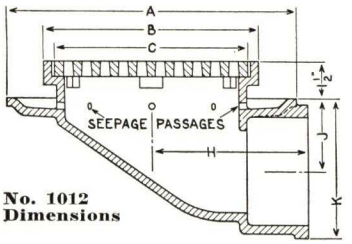
AMERICAN SEEP-PROOF AREA FLOOR DRAINS



No. 1002 Shallow Pattern Round Top
1005 Deep Pattern Round Top
1006 Shallow Pattern Square Top
1007 Deep Pattern Square Top

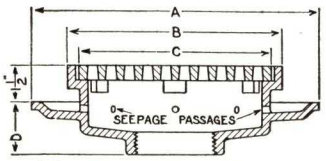
For Concrete, Tile, Mosaic, Terrazzo
Mastic and other Composition Floors

EXTRA HEAVY
ANTI-TILTING LOOSE GRATE
Without Inside Strainer

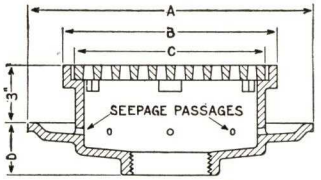


No. 1012 Dimensions

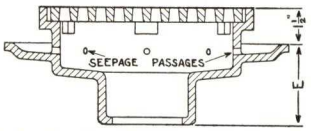
No. 1012 Round Top
1016 Square Top



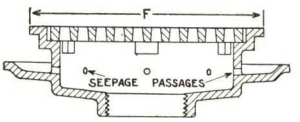
No. 1002 Dimensions



No. 1005 Dimensions



Hub Outlet For Inside Caulking



Square Top

Drains Equipped with Inside Strainer or Sediment Bucket at Additional Cost

Commercial Type—Bottom Outlet

Regularly furnished without Flashing Connection—Outlet Threaded Female Iron Pipe. Also furnished with Hub outlet inside Caulk when specified.

SPECIFICATIONS—Nos. 1002, 1005, 1006, 1007.
Dimensions are for Roughing In Only and may vary ¼ inch.

State Size Outlet	State Size Grate	A Inches	B Inches	C Inches	D Inches	E Inches	F Inches	Round Top No. 1002 or 1005 Black Cast Iron	Round Top No. 1002 or 1005 Brass Top Black Body	Round Top No. 1002 or 1005 Approx. Weight Pounds	Square Top No. 1006 or 1007 Black Cast Iron	Square Top No. 1006 or 1007 Brass Top Black Body	Square Top No. 1006 or 1007 Approx. Weight Pounds
2″	*9¾″	14	10½	9¾	2½	4½	11½	$7.00	$13.50	34	$ 7.35	$14.20	34
3″	*9¾″	14	10½	9¾	3	4¾	11½	7.00	$13.50	34	7.35	14.20	34
4″	*9¾″	14	10½	9¾	3	5	11½	7.00	13.50	34	7.35	14.20	34
4″	12½″	16½	13¼	12½	3	5	14¼	13.00	24.00	43	13.65	25.20	43
5″	*12½″	16½	13¼	12½	3¼	5	14¼	13.00	24.00	43	13.65	25.20	43
6″	*12½″	16½	13¼	12½	3¼	5	14¼	13.00	24.00	43	13.65	25.20	43

Commercial Type—Side Outlet

Regularly furnished without Flashing Connection—Hub Outlet for Soil Pipe. Also furnished with Outlet Threaded Female Iron Pipe when specified.

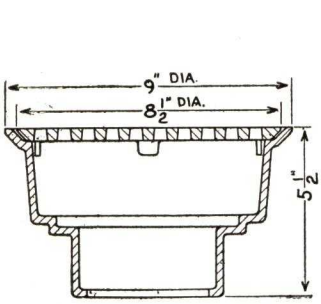
SPECIFICATIONS—Nos. 1012, 1016.
Dimensions are for Roughing In Only and may vary ¼ inch.

State Size Outlet	State Size Grate	A Inches	B Inches	C Inches	H Inches	J Inches	K Inches	Round Top No. 1012 Black Cast Iron	Round Top No. 1012 Brass Top Black Body	Round Top No. 1012 Approx. Weight Pounds	Square Top No. 1016 Black Cast Iron	Square Top No. 1016 Brass Top Black Body	Square Top No. 1016 Approx. Weight Pounds
2″	*9¾″	14	10½	9¾	7¼	3¼	5½	$10.00	$16.50	36	$10.35	$17.20	36
3″	*9¾″	14	10½	9¾	7½	2¾	5½	10.00	16.50	39	10.35	17.20	39
4″	*9¾″	14	10½	9¾	7¾	3¼	6½	12.00	18.00	44	12.35	18.70	44
4″	12½″	16½	13¼	12½	9	3¼	6½	22.00	33.00	56	22.65	34.20	56
5″	*12½″	16½	13¼	12½	9	4¾	8½	22.00	33.00	60	22.65	34.20	60
6″	*12½″	16½	13¼	12½	9	4¼	8½	22.00	33.00	65	22.65	34.20	65

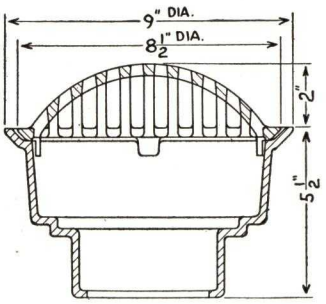
***Designates Diameter of Grate regularly furnished.**

Drains equipped with Backwater Valve, Deep Seal P Trap, or Primer Connection, at additional cost.

List Prices given are for Painted Cast Iron and Combined Iron and Brass. Can be furnished Galvanized, or all Cast Brass, also Chrom. Plated Finish or White Metal Top, when specified, at additional cost.



No. 1082 Round Top
With Flat Grate



No. 1083 Round Top
With Convex Grate

Cesspool Type—Light Pattern

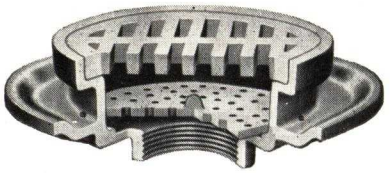
WITH ANTI-TILTING LOOSE GRATE—HUB OUTLET INSIDE CAULK

SPECIFICATIONS—Nos. 1082, 1083.

State Size Outlet	State Size Grate	Black Cast Iron	Brass Top Black Body	Approx. Weight Pounds
2″	8½″	$3.75	$9.50	12
3″	8½″	3.75	9.50	12
4″	8½″	3.75	9.50	12

List Prices given are for Painted Cast Iron and Combined Iron and Brass. Can be furnished Galvanized or All Cast Brass, also Chrom. Plated Finish or White Metal Top, when specified, at additional cost.

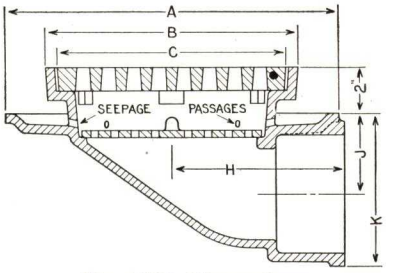
AMERICAN SEEP-PROOF AREA FLOOR DRAINS



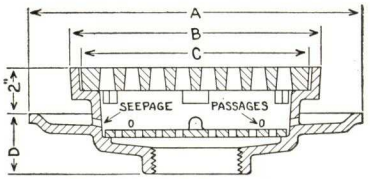
No. 1022 Round Top Bottom Outlet
1024 Square Top Bottom Outlet
1032 Round Top Side Outlet
1036 Square Top Side Outlet

For Concrete, Tile, Mosaic, Terrazzo
Mastic and other Composition Floors

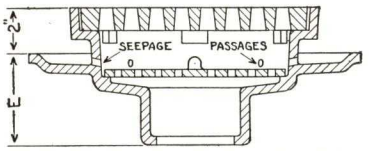
DOUBLE EXTRA HEAVY
ANTI-TILTING LOOSE GRATE
With Inside Strainer



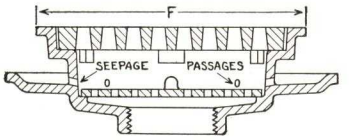
No. 1032 Dimensions



No. 1022 Dimensions



Hub Outlet for Inside Caulking



Square Top

Drains Equipped with Sediment Bucket at additional cost

Industrial Type—Bottom Outlet

Regularly furnished without Flashing Connection—Outlet Threaded Female Iron Pipe. Also furnished with Hub outlet inside Caulk when specified.

SPECIFICATIONS—Nos. 1022, 1024.
Dimensions are for Roughing In only and may vary ¼ inch.

State Size Outlet	State Size Grate	A Inches	B Inches	C Inches	D Inches	E Inches	F Inches	ROUND TOP No. 1022 Black Cast Iron	ROUND TOP No. 1022 Brass Top Black Body	ROUND TOP No. 1022 Approx. Weight Pounds	SQUARE TOP No. 1024 Black Cast Iron	SQUARE TOP No. 1024 Brass Top Black Body	SQUARE TOP No. 1024 Approx. Weight Pounds
2″	*10¾″	15¼	11¾	10¾	3	4½	12¾	$14.50	$25.50	38	$15.20	$26.80	38
3″	*10¾″	15¼	11¾	10¾	3¼	4¾	12¾	14.50	25.50	38	15.20	26.80	38
4″	*10¾″	15¼	11¾	10¾	3¼	5	12¾	14.50	25.50	38	15.20	26.80	38
4″	13″	17½	14¼	13	3¼	5	15¼	23.00	43.00	55	24.15	45.15	55
5″	*13″	17½	14¼	13	3¼	5	15¼	24.00	44.00	55	25.15	46.15	55
6″	*13″	17½	14¼	13	3¼	5	15¼	25.00	45.00	55	26.15	47.15	55
8″	*13″	17½	14¼	13	3¼	5¼	15¼	28.00	48.00	55	29.15	50.15	55

Industrial Type—Side Outlet

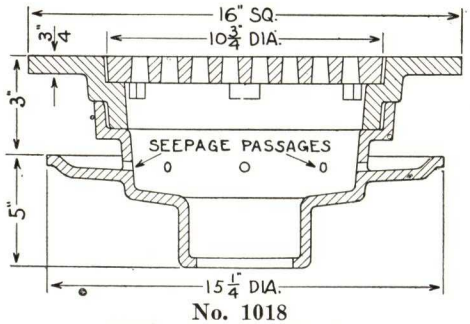
Regularly furnished without Flashing Connection—Hub Outlet for Soil Pipe. Also furnished with Outlet Threaded Female Iron Pipe when specified.

SPECIFICATIONS—Nos. 1032, 1036.
Dimensions are for Roughing In Only and may vary ¼ inch.

State Size Outlet	State Size Grate	A Inches	B Inches	C Inches	F Inches	H Inches	J Inches	K Inches	ROUND TOP No. 1032 Black Cast Iron	ROUND TOP No. 1032 Brass Top Black Body	ROUND TOP No. 1032 Approx. Weight Pounds	SQUARE TOP No. 1036 Black Cast Iron	SQUARE TOP No. 1036 Brass Top Black Body	SQUARE TOP No. 1036 Approx. Weight Pounds
2″	*10¾″	15¼	11¾	10¾	12¾	7½	3¾	6	$18.10	$31.85	40	$18.80	$33.15	40
3″	*10¾″	15¼	11¾	10¾	12¾	7¾	3¼	6	18.10	31.85	51	18.80	33.15	51
4″	*10¾″	15¼	11¾	10¾	12¾	8	3¾	7	18.10	31.85	56	18.80	33.15	56
4″	13″	17½	14¼	13	15¼	8½	3¾	7	28.75	53.75	68	29.90	55.90	68
5″	*13″	17½	14¼	13	15¼	8½	5¼	9	30.00	55.00	72	31.15	57.15	72
6″	*13″	17½	14¼	13	15¼	8½	4¾	9	31.25	56.25	77	32.40	58.40	77
8″	*13″	17½	14¼	13	15¼	8¾	6	11½	35.00	60.00	85	36.15	62.15	85

***Designates Diameter of Grate regularly furnished.**
Drains Equipped with Backwater Valve, Deep Seal P Trap, or Primer Connection, at additional cost.
NOTE: Low Dome, High Dome, Hinged and Locking Grate Furnished at Additional Cost.

List Prices given are for Painted Cast Iron and Combined Iron and Brass. Can be furnished Galvanized, or all Cast Brass. Also Chrom. Plated Finish or White Metal Top, when specified, at additional cost.



No. 1018
Without Inside Strainer

Packing House Type—Without Inside Strainer

Square Top—For Brick Floors

Regularly furnished without Flashing Connection—Hub Outlet inside Caulk.
Also furnished with Outlet Threaded Female Iron Pipe when specified.

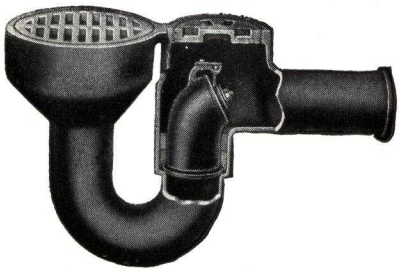
SPECIFICATIONS

State Size Outlet	State Size Grate	Black Cast Iron	Galv. Cast Iron	Approx. Weight, Pounds
3″—4″	10¾″	$18.50	$28.00	90
6″	10¾″	19.50	29.00	90

AMERICAN SEEP-PROOF AREA FLOOR DRAINS

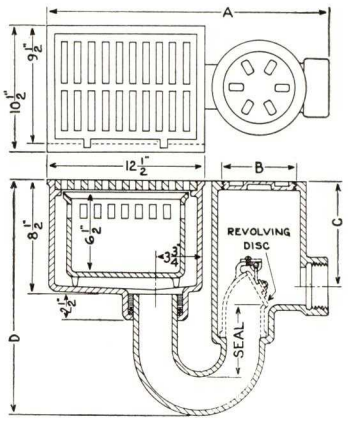
For Concrete, Tile, Mosaic, Terrazzo, Mastic and other Composition Floors

Self Cleansing Trap with or without Back Water Valve

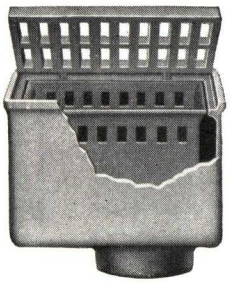


No. 1042 Round Top

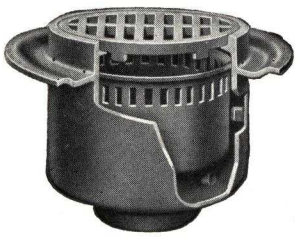
Brass Screwed Cleanout Plug with Countersunk Socket Wrench Hole extends to Finished Floor Level.



No. 1052—No. 1054 Dimensions Removable Sediment Buckets



No. 1054 Rectangular Top

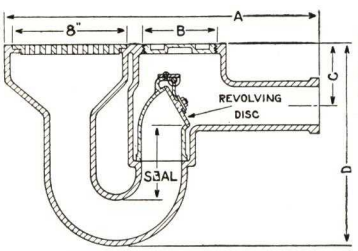


No. 1060 Round Top

No. 1065 Round Top

Combined Drain and Trap Type—Anti-Tilting Loose Grate

Regularly furnished with Brass Back Water Valve—Spigot Outlet for Soil Pipe. Also furnished with Hub outlet or Threaded Female Iron Pipe Outlet when specified.



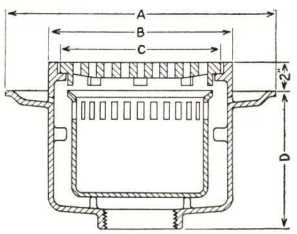
No. 1042 Dimensions

SPECIFICATIONS—No. 1042.
Dimensions are for Roughing In Only and may vary ¼ inch.

State Size Outlet	State Size Grate	A Inches	B Inches	C Inches	D Inches	Seal Inches	Without Safety Pan No. 1042 Black Cast Iron	Without Safety Pan No. 1042 Without B.W.V. Deduct	Without Safety Pan No. 1042 App. Wt. Lbs.
2″	8″	20¾	4½	4¼	11	4	$14.00	$4.00	45
3″	8″	21¾	5½	4	13¾	5	19.00	6.00	57
4″	8″	23¾	6½	4½	16	5	26.50	8.00	70

Combined Drain and Trap Type—Extra Heavy Hinged Grate

Regularly furnished Without Back Water Valve—Outlet Threaded Female Iron Pipe. Also furnished with Hub or Spigot Outlet when specified.



**No. 1060—
No. 1065 Dimensions**

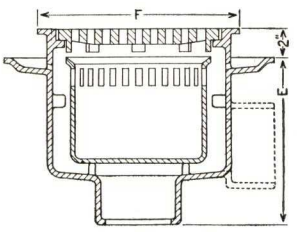
SPECIFICATIONS—Nos. 1052, 1054.
Dimensions are for Roughing In Only and may vary ¼ inch.

State Size Outlet	State Size Top	A Inches	B Inches	C Inches	D Inches	Seal Inches	With Trap No. 1052 Threaded Outlet Black Cast Iron	With B.W.V. Add	App. Wt. Lbs.	Without Trap No. 1054 Hub Outlet Black Cast Iron	App. Wt. Lbs.
2″	9″x12″	20	4½	7¼	14½	4	$32.50	$4.00	82	$19.00	57
3″	9″x12″	21	5½	7	17	5	35.00	6.00	90	19.00	57
4″	9″x12″	22	6½	6¾	18	5	38.50	8.00	102	19.00	57
6″	9″x12″	28	8¾	6½	21½	6	70.00	12.00	130	22.00	57

Non-Freezing Sediment Buckets furnished when Specified.

Deep Pattern Commercial Type—Extra Heavy Loose Grate

Regularly furnished Without Flashing Connection—Outlet Threaded Female Iron Pipe. Also furnished with Hub outlet inside Caulk when specified.



Square Top—Side Outlet—Inside Caulk

SPECIFICATIONS—Nos. 1060, 1065.
Dimensions are for Roughing In Only and may vary ¼ inch.

State Size Outlet	State Size Grate	A Inches	B Inches	C Inches	D Inches	E Inches	F Inches	With Safety Pan No. 1060 Black Cast Iron	With Safety Pan No. 1060 App. Wt. Lbs.	Without Safety Pan No. 1065 Black Cast Iron	Without Safety Pan No. 1065 App. Wt. Lbs.
2″	*10″	16	11	10	8	9¼	12	$21.50	59	$17.50	45
3″	*10″	16	11	10	8	9½	12	21.50	59	17.50	45
4″	*10″	16	11	10	8	9¾	12	21.50	59	17.50	45
4″	14″	20	15	14	11	12½	16	43.50	129	.....	..
5″	*14″	20	15	14	11	12½	16	43.50	129	.....	..
6″	*14″	20	15	14	11	12½	16	43.50	129	.....	..

***Designate Size of Loose Grate regularly furnished unless otherwise specified.**

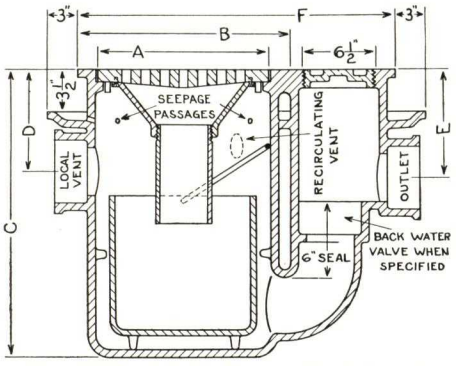
Non-Freezing Sediment Buckets furnished when specified.

List Prices given are for Painted Cast Iron. Can be furnished Galvanized, All Cast Brass, Iron Body Brass Top, Chrom. Plated Finish or White Metal Top, when specified, at additional cost.

Note: Square Top—Side Outlet at Added Cost.

AMERICAN SEEP-PROOF FLOOR DRAINS

Garage Type—Cast Iron



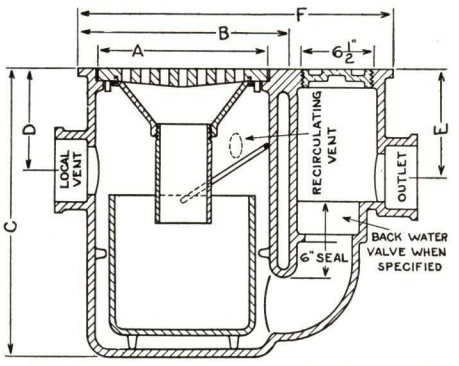
No. 1087 with Sediment Bucket and Gas Seal Cone Deflector With Safety Pan

EXTRA HEAVY ANTI-TILTING ROUND GRATE 4-INCH HUB OUTLET FOR SOIL PIPE

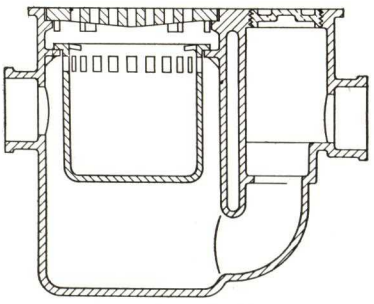
Brass Screwed Cleanout Plug with Countersunk Socket Wrench Head Extends to Finished Floor Level

Regularly furnished with 4-inch Local Vent—Without Flashing Connection and Without Back Water Valve.

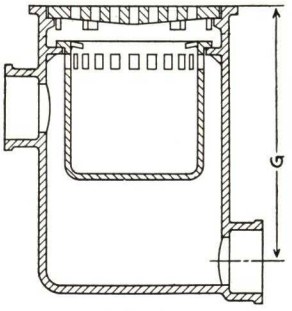
Also arranged with 2-inch, 3-inch or 4-inch Recirculating Vent above water line when specified at no additional cost. Recirculating Vent placed on Right Hand Side, unless otherwise specified.



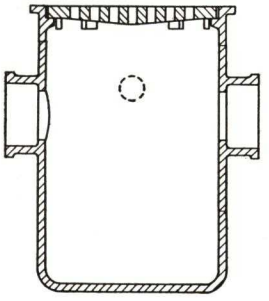
No. 1093 with Sediment Bucket and Gas Seal Cone Deflector Without Safety Pan



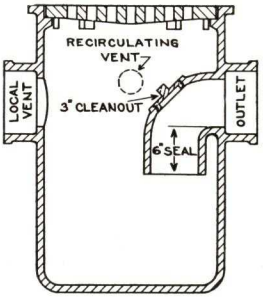
No. 1094 With Sediment Bucket



No. 1097 With Sediment Bucket



No. 1098 Without Sediment Bucket



No. 1095 Without Sediment Bucket

Diam. Grate In.	Height Overall In.	A In.	B In.	C In.	D In.	E In.	F In.	G In.	Slab Thickness	Outlet and Vent	Number 1087 List Prices	1087 Wt. Lbs.	Number 1093 List Prices	1093 Wt. Lbs.
14	24	14	16	24	8½	9	24	22	4″	4″	$ 76.50	272	$ 60.00	257
14	26	14	16	26	10½	11	24	24	6″	4″	83.00	284	66.50	269
14	28	14	16	28	12½	13	24	26	8″	4″	89.50	296	73.00	281
14	30	14	16	30	14½	15	24	28	10″	4″	96.00	308	79.50	293
14	32	14	16	32	16½	17	24	30	12″	4″	102.50	320	86.00	305
18	24	18	20	24	8½	9	28	22	4″	4″	100.50	354	80.00	334
18	26	18	20	26	10½	11	28	24	6″	4″	107.50	368	87.00	348
18	28	18	20	28	12½	13	28	26	8″	4″	114.50	382	94.00	362
18	30	18	20	30	14½	15	28	28	10″	4″	121.50	396	101.00	376
18	32	18	20	32	16½	17	28	30	12″	4″	128.50	410	108.00	390

Dimensions are for Roughing In Only and may vary ¼ inch.

MODIFICATION

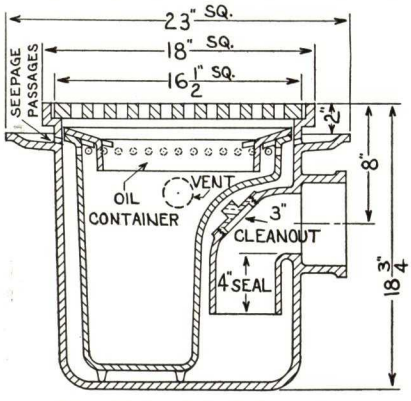
For approximate price on other styles of Drains not listed use the following differentials.

Add or Deduct Diameter ..... Grate	14″	18″
Local Vent	$ 3.00	$ 3.00
Back Water Valve.....	8.00	8.00
Sediment Bucket	10.00	12.00
Cone Deflector	6.00	8.00
Trap to Floor.....	14.00	14.00
Inside Trap	8.00	8.00

GARAGE DRAIN WITH DOUBLE WALL TRAP

Extra Heavy Bar Pattern Square Loose Grate Hub Outlet for Soil Pipe Brass Screwed Cleanout Plug
Removable Sediment Bucket and Oil Retainer Ring

Regularly furnished with 4″ Outlet, 2″ Right Hand Vent. Also furnished with Vent in any Desired Position when specified.



No. 1047 with Safety Pan

Always Specify size of Outlet, size of Vent and position Right or Left Hand.

Unless otherwise specified Outlet and Vent will always be furnished for Soil Pipe Connection.

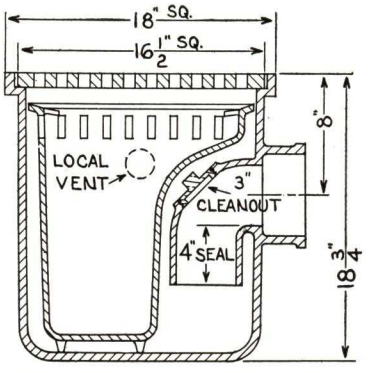
Outlet can be furnished with Hub for 3″ or 2″ Soil Pipe; also 4″, 3″ or 2″ Iron Pipe Female Thread when specified.

Vent can be furnished with Hub for 3″ or 4″ Soil Pipe; also 2″, 3″ or 4″ Iron Pipe Female Thread when specified.

SPECIFICATIONS

State Size Outlet	State Size Grate	Without Oil Retainer Ring No. 1046	With Oil Retainer Ring No. 1047
4″	16½″x16½″	$45.00*	$52.00**
Hinged Grate..Add		1.50	1.50
Sediment Bucket Deduct.....		14.00	14.00
Oil Retainer Ring Add or Deduct...		3.00	3.00

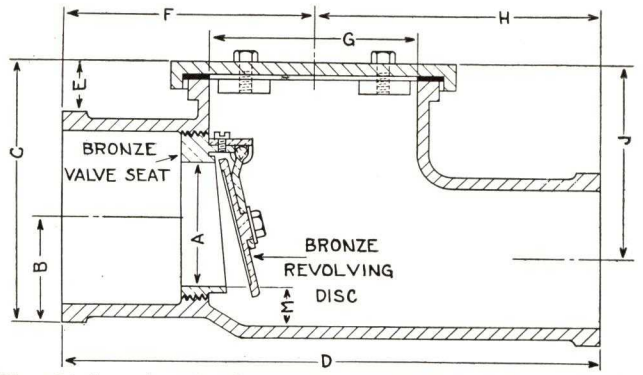
*App. weight, 275 lbs.
**App. weight, 300 lbs.



No. 1046 without Safety Pan

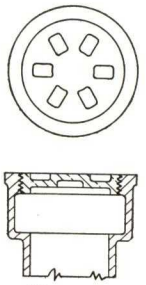
List Prices given are for Plain Cast Iron. Can be furnished Galvanized or Combined Iron and Brass, also Chrom. Plated Finish or White Metal Top, when specified, at additional cost.

AMERICAN BACKWATER TRAPS

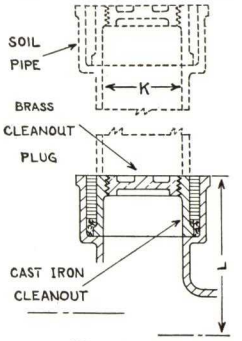


No. 583 American Backwater Trap with Bolted Cover, Heavy Cast Iron Body, with Bronze Bearings, Free Revolving Disc and Bronze Seat.

Open Flap Type



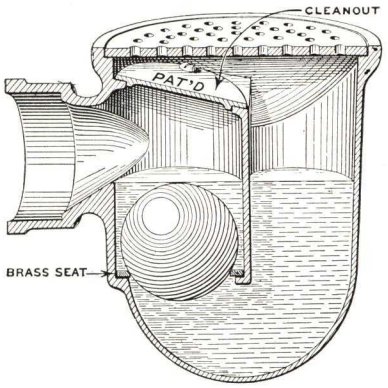
No. 585
With Threaded Brass Cleanout Cover



No. 587
With Hub for Caulking, Complete with Iron Cleanout and Brass Threaded Cover

Size Inches	No. 583	No. 585	No. 587	Weight Pounds	A Inches	B Inches	C Inches	D Inches	E Inches	F Inches	G Inches	H Inches	J Inches	K Inches	L Inches	M Inches
2	$10.00	$16.50	$16.50	19	2	1⅞	5⅛	14¼	1⅜	6	4	8¼	4⅝	4	7⅝	1¼
3	12.50	19.50	19.50	29	3	2⅝	6⅜	13¾	1⅛	6½	5	7¼	5	5	8⅛	1¼
4	17.50	24.00	24.00	30	4	3	7⅛	14¾	1⅛	7	6	7¾	5⅜	6	8½	1¼
5	24.10	29.90	29.90	50	5	3⅝	8⅛	16	⅞	7⅜	6⅝	8⅝	6¼	6	8¾	1½
6	28.70	34.50	34.50	65	6	4⅛	9⅛	17⅜	⅞	8	7¾	9⅜	6½	8	9½	1½
8	38.00	43.70	43.70	120	8	5⅛	11	24	¾	11	11	13	7⅜	10	10⅜	1½

Larger Sizes, Prices on Application. These Dimensions are for Roughing In Only and may vary ¼ of an inch.



With Back Water Trap
Fig. A—Hub Outlet
Fig. E—Spigot Outlet, ¾" "S" Pattern
Fig. F—Spigot Outlet Straight Pattern

HUNT'S COMBINED FLOOR DRAIN With Back Water Trap

PREVENTS SEWER GAS FROM ENTERING BUILDING SHOULD WATER SEAL BE BROKEN

THE ONLY DRAIN WITH AUTOMATIC BALL VALVE ON SEWER SIDE OF TRAP

Back Water Valve—Consists of a Large Copper Ball, which rests on a Brass Seat.

Operation—The Ball Valve operates automatically, allowing the waste water to flow freely through the outlet of the drain, but immediately after each discharge the ball seats itself on the brass seat and maintains a closed position against back water.

Seal—The back water valve being on the Sewer Side of the Trap, will maintain a Seal against sewer gas should the water evaporate from the basin of the drain.

Size Outlet Inches	Painted Cast Iron	Iron Body Polished Brass Top and Strainer	Approx. Weight Pounds	Dimensions Diam. Top Inches	Depth Overall Inches	Length Overall Inches
2	$ 8.00	$12.00	20	8	9	11½
3	12.00	18.00	30	9½	11	13¼
4	18.00	26.00	45	11	13	15

STOLTZ SANITARY BACK WATER VALVE AND DRAIN

To Caulk into Hub of Cast Iron Soil Pipe

Manually Controlled

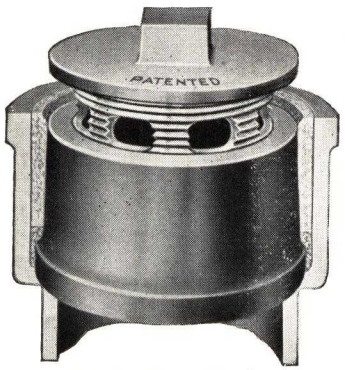


Fig. 1—Open Position For Drainage Purposes

When Valve is in a Closed Position a Positive Seal is Maintained against Back Water, Sewer Gas, Vermin and other objectionable Insects.

Easily Installed—Simple in Operation—Nothing to get out of order.

CAST IRON BODY
CAST BRASS COMBINATION VALVE
Regularly furnished with Square Raised Head.

Number		Each	Approx. Weight
2	For 2-inch Soil Pipe.....	$ 1.25	2 lbs.
3	For 3-inch Soil Pipe.....	1.75	3 lbs.
4	For 4-inch Soil Pipe.....	2.25	4 lbs.
5	For 5-inch Soil Pipe.....	5.00	6 lbs.
6	For 6-inch Soil Pipe.....	6.50	8 lbs.
8	For 8-inch Soil Pipe.....	15.00	15 lbs.
	Iron Key.....	.30	

Furnished with Countersunk Head when specified.

Countersunk Head Can Also Be Furnished

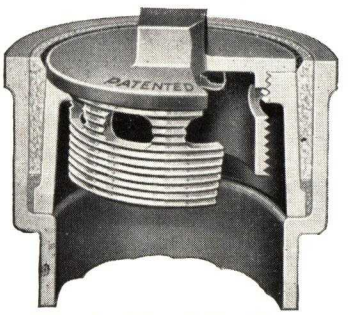
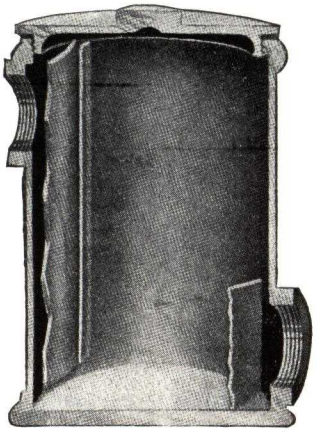


Fig. 2—Closed Position Check Against Back Water

STOLTZ SANITARY BACK WATER VALVES ARE ALSO ADAPTABLE TO OTHER TYPES OF DRAINS

AMERICAN GREASE TRAPS



No. 321 6-Inch Threaded Cover
No. 321-A Bolted Cover

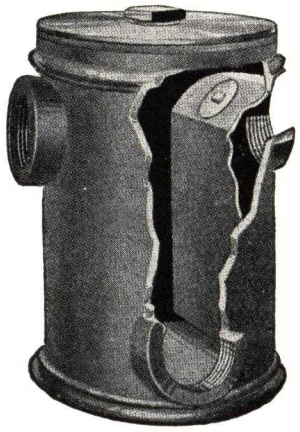
Cast Iron Body—Cast Brass Removable Cover

No. 321. Traps have a baffleplate cast integral with the trap, placed immediately in front of the lower opening, which is the inlet. Another large baffleplate prevents the grease from flowing out through the outlet opening.

No. 322—No. 323. The intercepter in these traps is cast integral with the trap, placed immediately in front of the outlet as shown and has a 1¼-inch brass trap screw in the web so that the outer space and waste pipe may be reached for cleaning.

Specifications Number	Height	Diameter	Inlet and Outlet	Painted	Weight Pounds
321 or 321A	10½″	7″	1½″ I.P.	**$10.00**	28
322 or 322A	10½″	7″	2″ I.P.	**13.00**	32
323 or 323A	10½″	12″	2″ I.P.	**18.00**	70

List Prices given are for Painted Cast Iron Body with Polished Brass Cover. Can be furnished Galvanized or Painted White Enamel Body, Nickel Plated or Chrom. Plated Finish Covers, when specified, at additional cost.



No. 322 6-Inch Threaded Cover
No. 322-A Bolted Cover
No. 323 6-Inch Threaded Cover
No. 323-A Bolted Cover

Cast Iron Body with Removable Cover

No. 175. Traps have a baffleplate cast integral in the center of the trap as shown, thus causing the water to ascend after entering the trap, the grease naturally collecting and remaining at the top as the water must first go down and come up over the baffeplate in seeking the outlet.

Specifications Number	Height	Width	Length	Inlet and Outlet	Painted	Weight Pounds
0	9″	8″	12″	2″ Hub	**$ 14.00**	45
0A	9″	8″	12″	1½″ I.P.	**15.00**	45
1	10″	11½″	19″	2″ Hub	**16.00**	85
1A	10″	11½″	19″	2″ I.P.	**17.00**	85
326	18½″	19¼″	22¼″	3″ Hub	**82.50**	260
326A	18½″	19¼″	22¼″	3″ I.P.	**85.50**	260
327	19½″	23¼″	33¼″	4″ Hub	**134.00**	400
327A	19½″	23¼″	33¼″	4″ I.P.	**138.00**	400

List Prices given are for Painted Cast Iron. Can be furnished Porcelain Enameled In and Out or Inside Only, when specified, at additional cost.

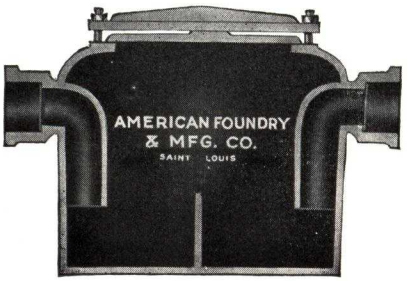


Fig. 175

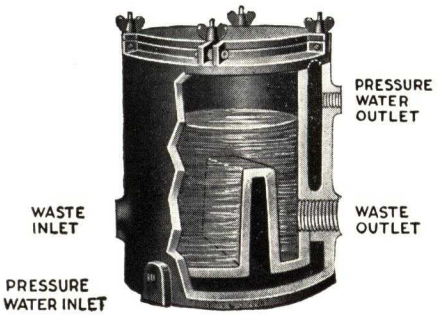


Fig. 335

AMERICAN WATER JACKET GREASE TRAPS

Cast Iron Body with Removable Cover

Fig. 335. Water Jacket Grease Traps are tested to withstand 60-pound pressure, yet we suggest and recommend that when water supply comes from roof tanks on high buildings or in cities where a heavy pressure is sustained, that pressure be reduced by water relief valve to 30 pounds or less to relieve excessive pressure on water jacket basins.

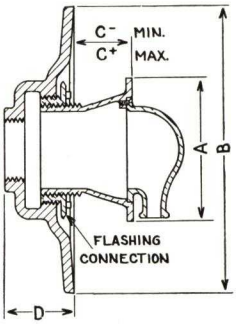
Regularly furnished with Iron Pipe Thread Connections.
Waste Inlet and Outlet can be furnished for Soil Pipe Connection when specified.

No.	Height	Depth Inside	Diam. at Top Inside	Waste Inlet and Outlet	Supply Cold Water	Grease in Pounds	Gals. Water per Hour	List Price Painted	Weight Pounds
10	15″	12″	10″	2″	¾″	25	75-100	**$48.00**	137
11	18″	15″	10½″	2″	¾″	35	100-150	**58.00**	193
12	19″	16″	13¾″	2″	1¼″	50	150-250	**98.00**	295
13	21″	18″	16¾″	3″	2″	80	250-350	**140.00**	407

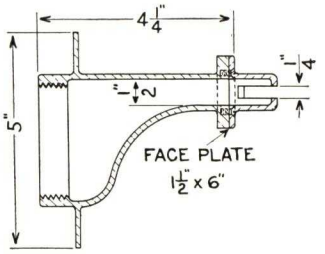
AMERICAN SWIMMING POOL DRAINS AND FITTINGS

No. 1204 FRESH WATER INLET CONNECTION WITH CAST BRASS ADJUSTABLE HEAD REMOVABLE FAN SHAPE FACE PLATE

Regularly furnished with Flashing Connection — Inlet Female Iron Pipe.



No. 1204 Dimensions



No. 1208 Dimensions

No. 1208

SPECIFICATIONS—No. 1204

State Size Inlet	State Size Outlet	A In.	B In.	C— In.	C+ In.	D In.	Cast Iron Body, Pol. Br. or N.P. Face Plate	Approx. Wt., Lbs.
1½"	1½"	5¼	10	1¼	2¼	2½	$11.00	10
2"	2"	5¼	10	1¼	2¼	2½	11.00	10
2½"	2½"	5¼	10	1¼	2¼	2¾	12.00	13½
3"	3"	5¼	10	1¼	2¼	2¾	12.00	13½
4"	4"	5¼	11	1¼	2¼	3	13.00	16½

Dimensions are for Roughing In Only and may vary ¼ inch.

No. 1208 FRESH WATER INLET OR SKIMMER SPRAY WITH REMOVABLE FAN SHAPE FACE PLATE

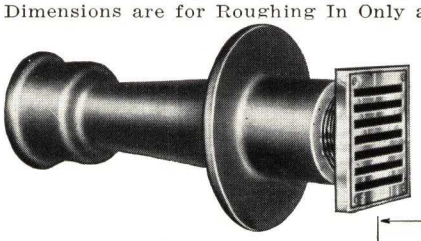
Regularly furnished with Slotted Fan Shape Spray—Inlet Threaded Female Iron Pipe. Also furnished with Straight Face Plate, Slotted, or Round Hole Spray when specified.

SPECIFICATIONS

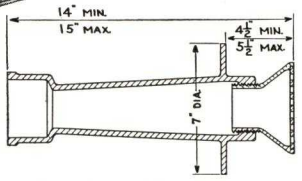
State Size Inlet	State Size Face Plate	Cast Brass Body, Pol. Br. or N.P. Face	Approx. Weight Pounds
2"	1½"x6"	$9.50	4
2½"	1½"x6"	9.50	4½

No. 1220 INLET AND OUTLET CONNECTION (CIRCULATING) WITH CAST BRASS ADJUSTABLE HEAD—REMOVABLE STRAINER

Regularly furnished—Hub Outlet for Soil Pipe.
Also furnished with Female Threaded Outlet when specified.



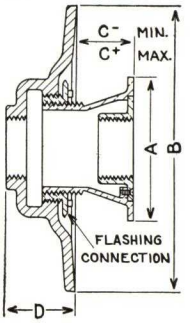
No. 1220



No. 1220 Dimensions

SPECIFICATIONS

State Size Pipe	State Size Strainer	Cast Iron Body, Pol. Br. or N. P. Strainer	Approx. Weight Pounds
2"	4"x4"	$ 8.50	10½
2"	5"x5"	9.75	11
3"	5"x5"	11.60	12½
2"	3"x9"	9.75	11
3"	3"x9"	11.60	12½
3"	6"x6"	13.50	13
4"	6"x6"	16.00	15



No. 1224 Dimensions

No. 1224

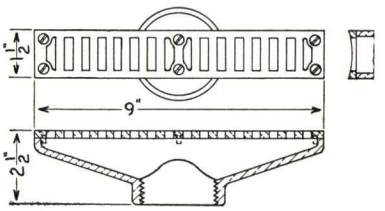
No. 1224 VACUUM ATTACHMENT—WITH CAST BRASS ADJUSTABLE INLET CONNECTION

Regularly furnished with Flashing Connection—Outlet Threaded Female Iron Pipe. Vacuum Connection 2-inch Iron Pipe Thread. Also furnished with Brass Plug to fit flush with top of Vacuum Connection when specified.

SPECIFICATIONS

State Size Outlet	State Size Inlet	A Inches	B Inches	C— Inches	C+ Inches	D Inches	Cast Iron Body, Pol. Br. or N.P. Face Plate	Approx. Weight Pounds
1½"	2"	5¼	10	1¼	2¼	2½	$10.50	9
2"	2"	5¼	10	1¼	2¼	2½	10.50	9
2½"	2"	5¼	10	1¼	2¼	2¾	11.50	12½
3"	2"	5¼	10	1¼	2¼	2¾	11.50	12½
4"	2"	5¼	11	1¼	2¼	3	12.50	15½

Dimensions are for Roughing In Only and may vary ¼ inch.

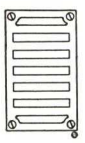


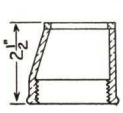
No. 1234

No. 1230

No. 1230 SCUM GUTTER DRAIN WITH FLAT TOP—REMOVABLE STRAINER

Regularly furnished with Flat Strainer — Outlet Threaded Female Iron Pipe. Also furnished with Concave Top when specified.

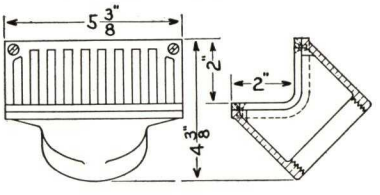




SPECIFICATIONS

State Size Outlet	State Size Top	Cast Brass Body, P.B. or N.P. Top	Approx. Weight Pounds
1½"	3¾"x2¼"	$4.50	2
2"	3¾"x2¼"	4.50	2
2½"	5⅜"x2½"	7.00	3½
3"	5⅜"x2½"	7.00	3½

Always Specify whether Nickel Plated or Polished Finish



No. 1232

SCUM GUTTER DRAIN (ANGLE PATTERN) WITH REMOVABLE STRAINER

Regularly furnished—Outlet Threaded Female Iron Pipe.

State Size Outlet	State Size Top	Cast Brass Body, P.B. or N.P. Top	Approx. Weight Pounds
1½"	5⅜"x2"	$6.50	2
2"	5⅜"x2"	6.50	2
2½"	5⅜"x2"	6.50	2

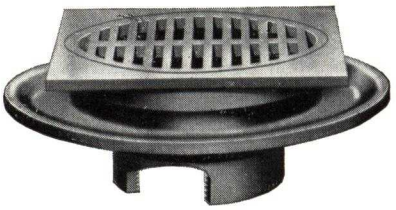
SCUM GUTTER DRAIN WITH CONCAVE TOP—REMOVABLE STRAINER

Regularly furnished with Concave Top — Outlet Threaded Female Iron Pipe. Also furnished with Flat Top when specified.

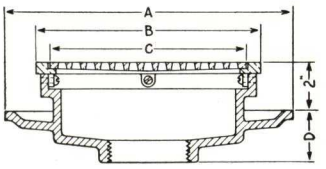
State Size Outlet	State Size Top	Cast Brass Body, P.B. or N.P. Top	Approx. Weight Pounds
1½"	1½"x9"	$7.00	2½
2"	1½"x9"	7.00	2½

List Prices given are for Nickel Plated or Polished Finish. Can be furnished Chrom. Plated or White Metal Finish, All Cast Brass or Galvanized Iron Body, when specified, at additional cost.

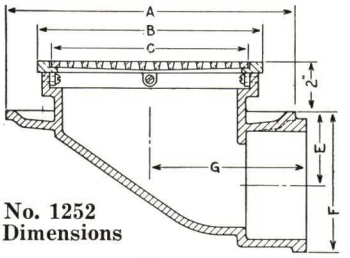
AMERICAN SWIMMING POOL DRAINS AND FITTINGS



No. 1250



No. 1250 Dimensions



No. 1252 Dimensions

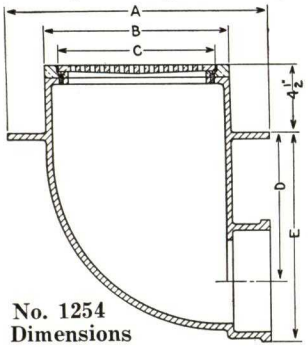
MAIN POOL OUTLET DRAIN WITH REMOVABLE STRAINER (With Safety Pan—No Seep Holes)

Square Top with Slotted Strainer. Can be Furnished with Round Hole Strainer when specified

Regularly furnished without Flashing Connection—Outlet Threaded Female Iron Pipe. Also furnished with Hub Outlet Inside Caulk when specified.

SPECIFICATIONS—Nos. 1250, 1252.
Dimensions are for Roughing In Only and may vary ¼ inch.

State Size Outlet Inches	State Size Strainer Inches	A In.	B In.	C In.	D In.	E In.	F In.	G In.	Threaded Outlet No. 1250 Cast Iron Body, Pol. Br. or N. P. Top	Threaded Outlet No. 1250 Approx. Weight Pounds	Hub Outlet No. 1252 Cast Iron Body, Pol. Br. or N. P. Top	Hub Outlet No. 1252 Approx. Weight Pounds
3	9¾	14	11	9¾	3	2¾	5½	7½	$14.20	34	$18.70	44
4	9¾	14	11	9¾	3	3¼	6½	7¾	14.20	34	18.70	44
5	12½	16½	13¾	12½	3¼	4¾	8½	9	25.20	43	34.20	60
6	12½	16½	13¾	12½	3¼	4¼	8½	9	25.20	43	34.20	65



No. 1254 Dimensions

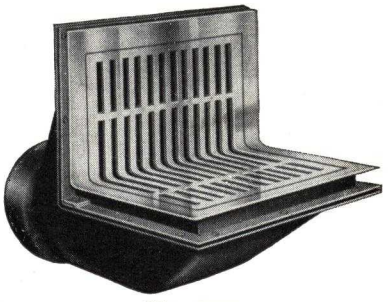
No. 1254 MAIN POOL OUTLET DRAIN WITH REMOVABLE STRAINER

Square Top with Slotted Strainer
Can be Furnished with Round Hole Strainer when specified

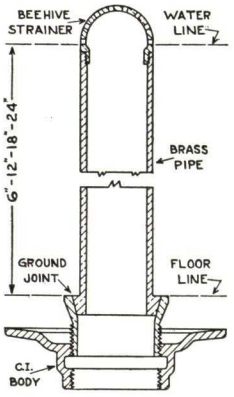
Regularly furnished with Hub Outlet for Soil Pipe. Also furnished with Female Threaded Outlet when specified.

Specifications—Dimensions are for Roughing In Only and may vary ¼ inch.

State Size Outlet Inches	State Size Top Inches	A In.	B In.	C In.	D In.	E In.	Cast Iron Body, Pol. Br. or N. P. Top	App. Wt. Lbs.
4	12x12	17¼	12	11	10¼	13¼	$43.00	84
5	12x12	17¼	12	11	9¾	13¼	43.00	84
6	12x12	17¼	12	11	9¼	13¼	43.00	84
8	15¼x15¼	23¼	15¼	14	18¼	24	70.00	175
10	15¼x15¼	23¼	15¼	14	17¼	24	70.00	175



No. 1256



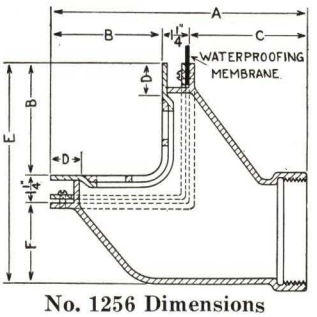
No. 1266

No. 1256 MAIN POOL OUTLET DRAIN WITH REMOVABLE STRAINER (Angle Pattern Reversible)

Regularly furnished with Flashing Connection—Outlet Threaded Female Iron Pipe. Also furnished with Hub Outlet when specified.

Specifications—Dimensions are for Roughing In Only and may vary ¼ inch.

State Size Outlet Inches	State Grate Surface Inches	A In.	B In.	C In.	D In.	E In.	F In.	Cast Iron Body, Pol. Br. or N. P. Top	App. Wt. Lbs.
2	*5x8	8¾	5	2½	1	8¼	2	$26.75	30
3	*5x8	8¾	5	2½	1	8¼	2	26.75	30
4	*5x8	8¾	5	2½	1	8¼	2	26.75	30
4	9x10½	16¾	7	8½	1¾	13¼	5	40.00	55
5	*9x10½	16¾	7	8½	1¾	13¼	5	40.00	55
6	*9x10½	16¾	7	8½	1¾	13¼	5	40.00	55



No. 1256 Dimensions

No. 1266 POOL OR FOUNTAIN DRAIN WITH REMOVABLE OVERFLOW CONNECTION (With Safety Pan—No Seep Holes)

SPECIFICATIONS State Size Outlet	State Height Standpipe	Cast Iron Body, Pol. Br. or N. P.	Approx. Weight Pounds
2″	6″	$12.80	9¾
2″	12″	14.60	11¾
2″	12″	16.40	13¾
2″	18″	18.20	15¾
3″	6″	16.10	15½
3″	12″	19.70	19¾
3″	18″	23.30	24
3″	24″	26.90	28¼

No. 1270 HAIR INTERCEPTOR FOR CIRCULATING LINES

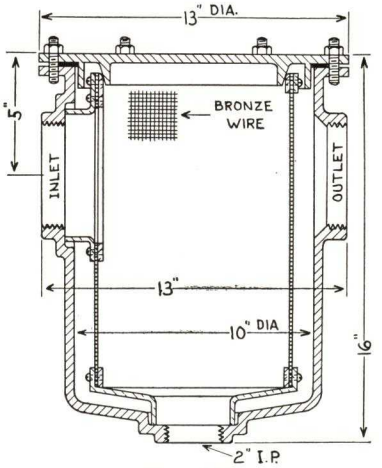
Extra Heavy Cast Iron Body with Removable Cover and Brass Basket

Regularly furnished—Threaded Female Iron Pipe Connections. Can be furnished with Flange Connections at added cost.

SPECIFICATIONS State Size Inlet	State Size Outlet	Painted Enameled Cast Iron Body	Approx. Weight Pounds
2″	2″	$73.00	110
3″	3″	73.00	110
4″	4″	75.50	110
5″	5″	76.50	110
6″	6″	77.50	110

Specify whether Nickel Plated or Polished Finish

List Prices given are for Nickel Plated or Polished Finish. Can be furnished Chrom. Plated or White Metal Finish, All Cast Brass or Galvanized Iron Body, when specified, at additional cost.



No. 1270

AMERICAN OUTDOOR DRINKING FOUNTAINS

Anti-Freezing

American Type "D" Cast Iron Bubble Fountain is Sanitary, Self-Closing, Anti-Freezing and Self-Draining.
The Bubbler is set at an angle from the vertical and opening is above the edge of the receptor so that bubbler opening will not be flooded in case the drain from the bowl of the fountain becomes clogged. Bubbler furnished with Mouth Guard when required. Inside Working Parts can be repaired without digging up and we recommend this fountain for durability and low cost of maintenance. See sectional illustration showing simplicity in construction.

Type "D"

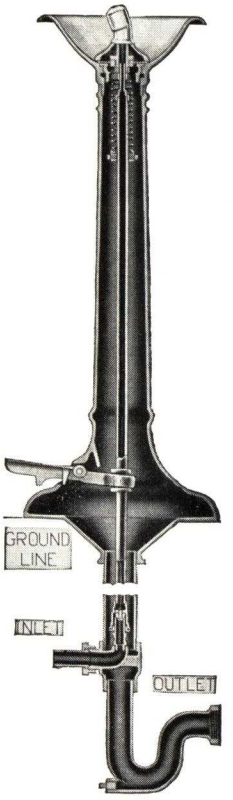
FURNISHED IN THE FOLLOWING FINISHES

Length in Ground	Alum. Ptd. Cast Iron Receptor Painted Pedestal	Porc. Enmld. Cast Iron Receptor Painted Pedestal	Chrom. Pltd. Bronze Receptor Painted Pedestal	Chrom. Pltd. Bronze Receptor Porc. Enmld. Pedestal	Porcelain Enameled All Over
1½ or 2 feet	$58.00	$63.00	$68.00	$ 98.00	$103.00
2½ or 3 feet	60.00	65.00	70.00	100.00	105.00
3½ or 4 feet	62.00	67.00	72.00	102.00	107.00
4½ or 5 feet	64.00	69.00	74.00	104.00	109.00
5½ or 6 feet	66.00	71.00	76.00	106.00	111.00

WEIGHT—Approximately 120 pounds for length 2 feet in ground. Add 5 pounds for each additional foot in length.

DESCRIPTION

Receptor—Cast Iron Aluminized painted or Porcelain Enameled—Cast Bronze, Chromium Plated.
Bubbling Nozzle—Bronze, Chromium Plated, Anti-Squirt Type, Concealed regulating screw in head to adjust flow of water.
Pedestal—Cast Iron, strong and durable. Painted Green in color. Other finishes furnished when desired.
Inner Working Parts—All Brass, simple in construction, no complicated or intricate parts to get out of order.
Valve Spring—Phosphor Bronze, rust proof, insures long life.
Supply Pipe—Brass, iron pipe size.
Pedal—Foot Operated, positive shutting off of valve after each operation.
Self-Closing—A slight pressure on the foot pedal supplies a refreshing flow of water which stops instantly when foot is removed.
Self-Draining—No water remains within fountain to freeze in winter or become stagnant in summer.
Anti-Freezing—Inlet Connection and Control Valve buried below frost line.
Trap—Brass Cleanout Plug permits, if necessary, the removal of any foreign matter Without Disconnecting or Removing Fountain from ground.



Sanitary—Clean Sweep Trap, at waste outlet, maintains an absolute water seal, prevents Sewer Gas from rising to drinking point or coming in contact with the supply.
Tested—Each fountain is thoroughly tested before leaving factory.
Repairing—Simplicity of construction permits renewing of valve packings without digging up fountain. By removing pedal, bubble nozzle and spring gland, all inner working parts can then be withdrawn.

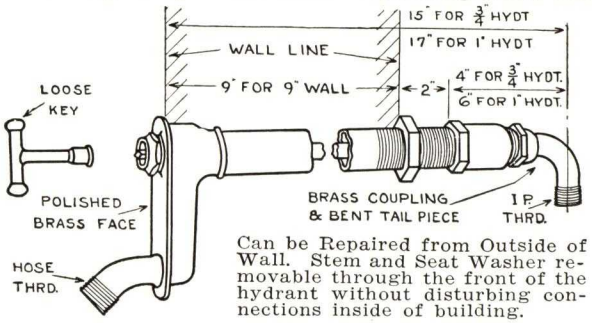
DIMENSIONS

Receptor—12″ diameter. **Base**—14″ diameter.
Height Above Ground—34″. Furnished 30 inches high where required.
Length in Ground—1½′ from ground line to inlet connection.
Longer Lengths—Furnished in multiples of 6″.
Inlet Connection—¾″ I. P. male thread tailpiece with heavy brass union coupling.
Waste Outlet Connection—1½″ I. P. female thread.
Center of Inlet to Center of Waste Outlet—3½″.

No. 75
With Polished Brass Face

AMERICAN WALL HYDRANT

Anti-Freezing Compression Valve—Operating Parts Brass



Can be Repaired from Outside of Wall. Stem and Seat Washer removable through the front of the hydrant without disturbing connections inside of building.

Length—Illustration shows dimensions applying to a hydrant for a 9-inch wall. For other length hydrants to go through wall, these dimensions will be in proportion.
Outer Casing Pipe—Is always 2 inches longer than thickness of wall (allowing for unevenness).
Overall Dimension—For ¾-inch hydrant is always 6 inches longer than thickness of wall, for 1-inch hydrant, 8 inches longer than thickness of wall.

Wall Thickness .....Inches	9	11	13	15	16	18	20	22	24	26	28	30	32	34	36
*¾-Inch Size .....Each	5.00	5.25	5.50	5.65	5.75	6.00	6.25	6.50	6.75	7.00	7.25	7.50	7.75	8.00	8.25
**1-Inch Size .....Each	9.00	9.30	9.60	9.90	10.05	10.35	10.65	10.95	11.25	11.55	11.85	12.15	12.45	12.75	13.05

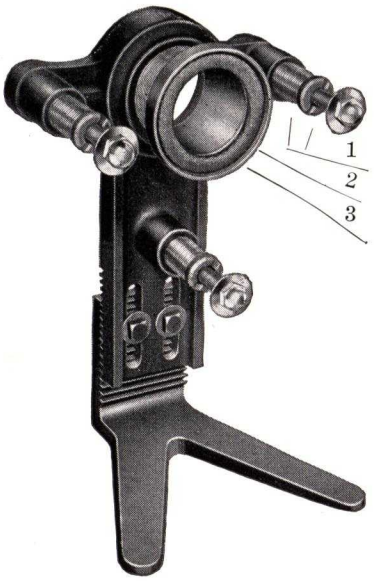
Add for Nickel Plated Face, each $0.50 **Add for Chromium Plated Face, each $0.90**

***Size ¾-inch regularly furnished with Nozzle Outlet for ¾-inch Hose Thread, Inlet Connection ½-inch I. P. Thread. Can be furnished with ¾-inch Inlet Connection when specified at same price.**

****Size 1-inch regularly furnished with Nozzle Outlet for 1-inch Hose Thread, Inlet Connection ¾-inch I. P. Thread. Can be furnished with 1-inch Inlet Connection when specified at same price.**

Type 1935

AMERICAN ADJUSTABLE CLOSET SUPPORTS



1. Independent Adjustment
2. Adjustable Closet Flange
3. Graphited Asbestos Gasket

A SUPERIOR SUPPORTING STRUCTURE FOR WALL HUNG CLOSET BOWLS

All Adjustments Made from Front Side of Wall

Carrier Chair—Cast Iron, Extra Heavy, Plain or Galvanized, Adjustable in Height. Can be furnished to fit any make of Blowout or Syphon Jet Bowl.

Foot—Cast Iron, Extra Heavy, V-shaped, Non-Slip Adjustment. Can be furnished in reversed position, solid foot and other arrangements when required.

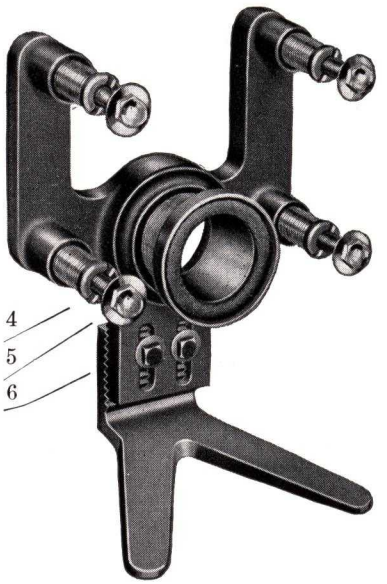
Bearing Sleeves — Cast Iron, externally threaded, screw into internally threaded holes in the carrier chair.

Stud Bolts—Cold Roll Steel, Extra Long, are so threaded that they can be adjusted without cutting them off.

Cap Nuts and Washers—Cast Brass or White Metal with Nickel Plated or Chromium Plated finish.

Closet Flange—Cast Brass, Adjustable, furnished to fit any style of bowl.

Gasket—Graphited Asbestos, furnished to fit any style of bowl.



4. Bearing Device
5. Retaining Device
6. Non-Slip Adjustment

Outlet Connection—Can be furnished for Threaded Iron Pipe, Soil Pipe, Lead Pipe or Copper Tubing Soldered Joint.

Bearing Device—Consists of several bearing sleeves externally threaded, which screw into internally threaded holes in the carrier chair; these sleeve are provided with enlarged heads, to support bowl.

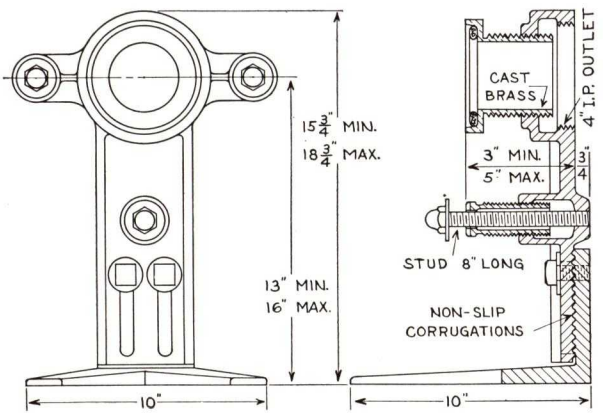
Retaining Device—Consists of several stud bolts adjustably mounted in carrier chair and provided with cap nuts and washers that engage the bowl and clamp same tightly against the bearing sleeves.

Independent Adjustment—The stud bolts pass inwardly through the bearing sleeve without contact, therefore, even though the stud bolts turn during the operation of tightening the cap nuts, there is no possibility of the bearing sleeve turning and getting out of adjustment.

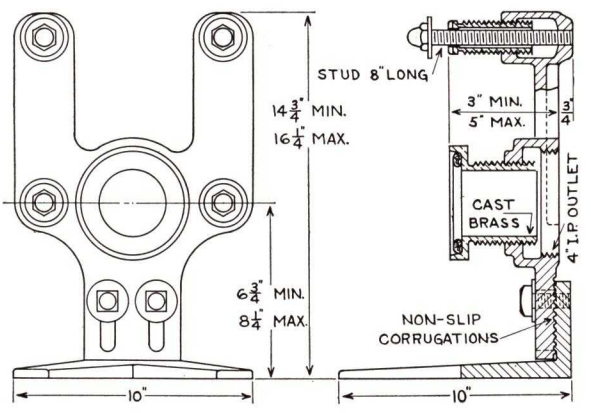
Installation—The carrier chair is embedded in the wall prior to finishing the front face of the wall. If the wall is provided with a facing of tile, marble or the like, the carrier chair is set inwardly some distance from the rough or unfinished face of the wall and after the finished surface is applied, the bearing sleeve pieces are screwed into the carrier chair and set or adjusted so that front ends will project about 1/16 of an inch beyond the finished front face of the wall.

Irregularity or Unevenness—If there is any irregularity or unevenness in the portions of the bowl that come in contact with the wall, or if the finished face of the wall is wavy or irregular, such conditions are taken care of, due to the fact that the bearing sleeves and closet flange are accessible from the front side of the wall and can be easily adjusted so as to set them in proper position.

No Nipples or Sleeves to cut, Lock Nuts to set or other Intricate Parts to get out of adjustment



No. 1 For Blowout Bowl



No. 5 For Syphon Jet Bowl

	List Prices	
Complete with Bearing Sleeve, Brass Closet Flange, Graphited Asbestos Gasket, Stud Bolts, Chromium Plated Brass Cap Nuts and Washers and Test Plug	No. 1 $15.00	No. 5 $16.00
Approximate Weight, Pounds	32	37

Regularly furnished with Outlet Threaded Female for Iron Pipe.

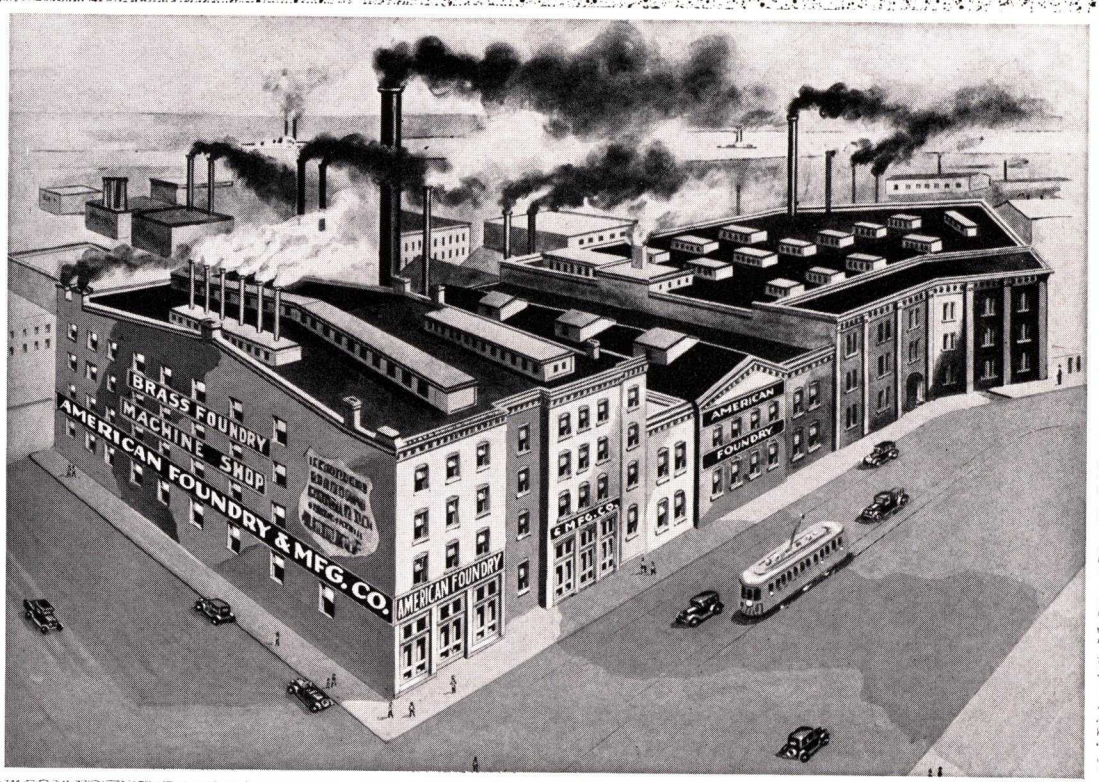
Chair Carrier furnished with Solid Foot at No Extra Cost. Specify Style when ordering.

Adjustable Foot can be furnished in Reverse Position at No Extra Cost.

Longer Foot furnished at Extra Cost.

Longer Length Bearing Sleeves, Closet Flanges and Stud Bolts furnished at Extra Cost.

Also furnished with Outlet for Soil Pipe.



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THE BARRETT COMPANY

Barrett-Holt Roof Drains

NEW YORK, N. Y. CHICAGO, ILL. BIRMINGHAM, ALA.

THE BARRETT COMPANY LIMITED, MONTREAL, QUE.

For Complete Details and Specifications on Barrett Built-up Roofing, Waterproofing, Dampproofing and Barrett Rock Wool Insulation, see File Index

BARRETT-HOLT ROOF DRAINS AND VENT CONNECTIONS

For All Types of Roof Construction

In all types of roof construction, it is of paramount importance that roof drains and vent connections be as effective and permanent as the roof coverings they serve. Twenty years of use have proved Barrett-Holt Roof Leader and Vent Connections to be the most dependable on the market.

For Complete Specifications and Details of Barrett-Holt Roof Drains, see Barrett Reference Manual on Built-up Roofing in File Index.

There is a type for every need. Each consists of a roof fitting with roof locking attachment, a component flashing flange and an expansion joint.

The types used with inside leader pipes are equipped with a cast-metal tile or gravel stop, a strainer plate, and serviceable cast-metal strainer.

Types and Details (Specify by Key Number)

Type 1-LG (Slag or Gravel Surface)
Type 1-LS (Smooth Surface)
Type 1-LM (Metal Covered Gutters)
For flat roofs having interior drainage, where ample working space is provided below roof deck, excepting roofs covered with tile or a similar material.

Type 2-LG (Slag or Gravel Surface)
Type 2-LS (Smooth Surface)
For inclined roofs ranging from 12° to 42° and having interior drainage. The range of variation of the standard connection is from 18° to 28°. For lesser inclines ranging from 12° to 18°, or greater inclines ranging from 28° to 42°, special fittings are furnished.

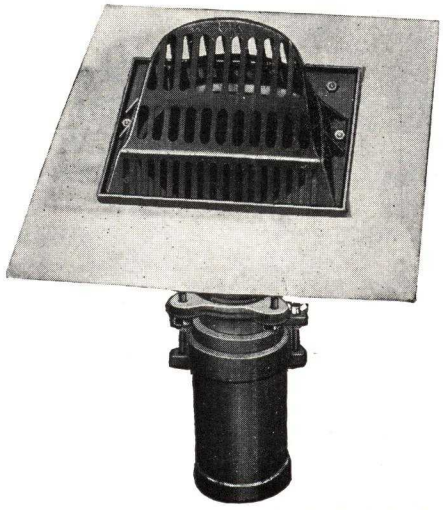
Type 5-LG (Slag or Gravel Surface)
Type 5-LS (Smooth Surface)
Type 5-LM (Metal Covered Gutters and Roofs)
For flat roofs having interior drainage, where a sump type of roof connection is desired.

Type 6-LG (Slag or Gravel Surface)
Type 6-LS (Smooth Surface)
Type 6-LM (Metal Covered Gutters and Roofs)
For flat roofs having interior drainage where working space below the roof decks is restricted, excepting roofs covered with tile or a similar material.

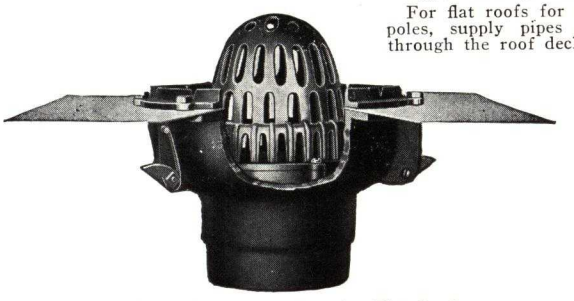
Type 6-LT for flat roofs, surfaced with tile or similar material and having interior drainage.

Type 6-VG (Slag or Gravel Surface)
Type 6-VS (Smooth Surface)
Type 6-VT (Tile or Similar Surface)
Type 6-VM (Metal Covered Roofs)
For flat roofs for soil and waste vent stacks, flagpoles, supply pipes or any similar fixture carried through the roof deck.

Type 1 Leader Connection for Flat Roofs

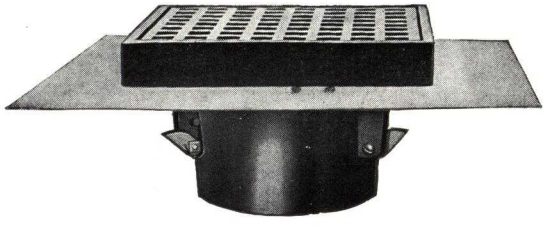


Type 2 Leader Connection for Inclined Roofs



Type 5 Leader Connection for Flat Roofs

Type 6 Leader Connection for Flat Roofs

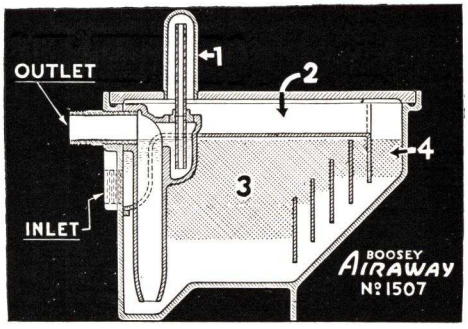


Type 6 Leader Connection for Tile Surfaced Roofs

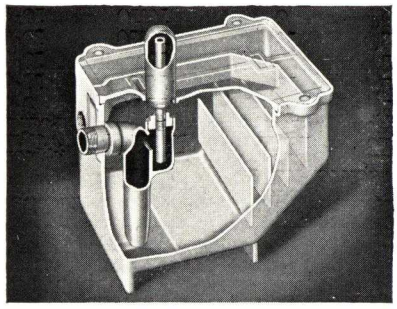
Type 6 Vent Connection for Flat Roofs

NORMAN BOOSEY MFG. CO.

5140 Hamilton Avenue
DETROIT, MICH.



Air-a-way GREASE INTERCEPTORS



(1) The internal Air Relief Vent and Siphon Breaker which eliminates internal head pressure and prevents siphonage.

(2) The Inlet Scupper through which all incoming waste is carried *above* the contents of the interceptor. This allows the accumulated grease in the retaining chamber to remain undisturbed.

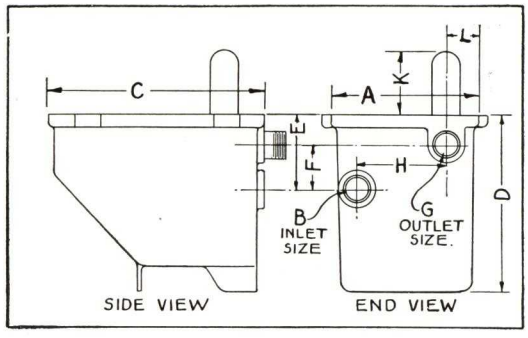
(3) The currentless Grease Retaining chamber into which the grease is guided after being separated from the waste water. The series of baffle plates directs the flow current along the bottom of the interceptor, *beneath* the retaining chamber. As the accumulated grease remains out of the flow current, it cannot become churned up by the incoming waste water and carried out with the flow. *Grease does not build up in the flow-way until the approximate retaining capacity of the interceptor has been reached.*

(4) The Self-clogging Flow-Way is one of the most important features of the Boosey AIR-AWAY Grease Interceptor. As illustrated, when retained grease has reached a depth in the flow-way, as indicated, *and allowed to congeal during an inactive period,* the interceptor becomes clogged. The congealed grease must be removed before the fixture can be used again. *Additional grease cannot pass through the interceptor to the sewer.* As the depth of grease in the flow-way is less than in any other section of the interceptor it will congeal more quickly and firmly at that point.

The Boosey AIR-AWAY Grease Interceptor is efficient in operation, inexpensive to install and neat in design. Made of cast iron, it is regularly furnished with an enameled finish. If specified, the AIR-AWAY can be furnished with porcelain enameled finish, inside or outside.

Wherever tested at rated capacities, by State or municipal plumbing departments, the AIR-AWAY has been approved as being superior to code requirements. It is made in eight sizes to meet the requirements of various types of installations. Specify it by name and number—Boosey AIR-AWAY, No. 1507.

Note: *Outside water cooler can be furnished, when specified.*



INTERCEPTORS DIMENSIONS AND LISTS

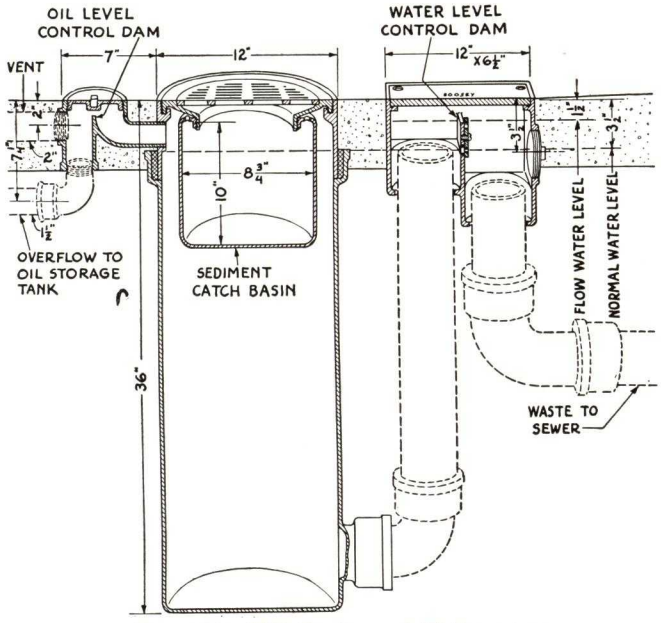
Plate No.	Waste size, in.	Flow per minute, gal.	Grease, lbs.	Measurements in inches											Approx. shipping weight less cooler, lbs.	List, tapped	List, hub	Add for water cooler	Add for aluminum basket	Add for porcelain enamel outside
				A	B	C	D	E	F	G	H	J	K	L						
1507-OO	1½	5	7	8½	1½	12	11	5⅝	3⅞	1½	5	1¾	6	1¾	70	$ 25.00	.....	.....	Quoted on Application	$ 18.00
1507-O	1½–2	10	15– 20	10½	1½–2	12½	14	6 3/16	4	1½–2	5 9/16	2 3/16	6	3	90	30.00	$ 31.50	.....		22.00
1507-A	1½–2	12	20– 25	11½	1½–2	15	14	6⅛	3⅝	1½–2	6 11/16	2½	6	3	120	40.00	41.50	$ 5.50		30.00
1507-B	1½–2	14	25– 30	12	1½–2	17	14	5 15/16	3¾	1½–2	6⅝	2 3/16	6	3	140	55.00	56.50	6.00		35.00
1507-C	2	16	30– 40	14	2	20	14	6⅛	3⅞	2	8	2¼	6	3	160	70.00	71.50	7.50		40.00
1507-D	2	20	50– 60	14	2	20	18	6⅛	3⅞	2	8	2¼	6	3	200	105.00	108.20	7.50		50.00
1507-E	2 –3	25	80–100	18	2 –3	24	18	8¾	5¼	3	5⅞	3½	6	5	280	162.00	165.20	18.00		70.00
1507-G	3 –4	35	120–180	18	3 –4	24	29	10¼	6½	3 –4	9¼	4⅛	6	6½	490	250.00	255.00	22.00		122.50

BOOSEY GASOLINE AND OIL SEPARATOR

Efficient in Operation—Economical to Install

The Boosey No. 1610 Oil Separator is simple in design, easy and comparatively inexpensive to install and, after the original installation, maintenance cost is practically nil.

The outstanding feature of the Boosey No. 1610 is the fact that it requires no valves, floats, or other moving parts. Its successful and efficient operation is based upon the difference in the specific gravities of water and oil. The separation of oil and volatile liquids from the waste water, by gravity, is accomplished by means of a bypass dam in the water level control chamber at separator outlet. During operation, the normal water level rises to the flow level, which is 1 in. below the level of the oil overflow opening in the separator. This causes the water in the separator to rise accordingly, and all oil or volatile liquids of a depth greater than 1 in. above the flow water level are taken off through the oil overflow line, and directed to the storage tank.



Boosey No. 1610 Gasoline and Oil Separator

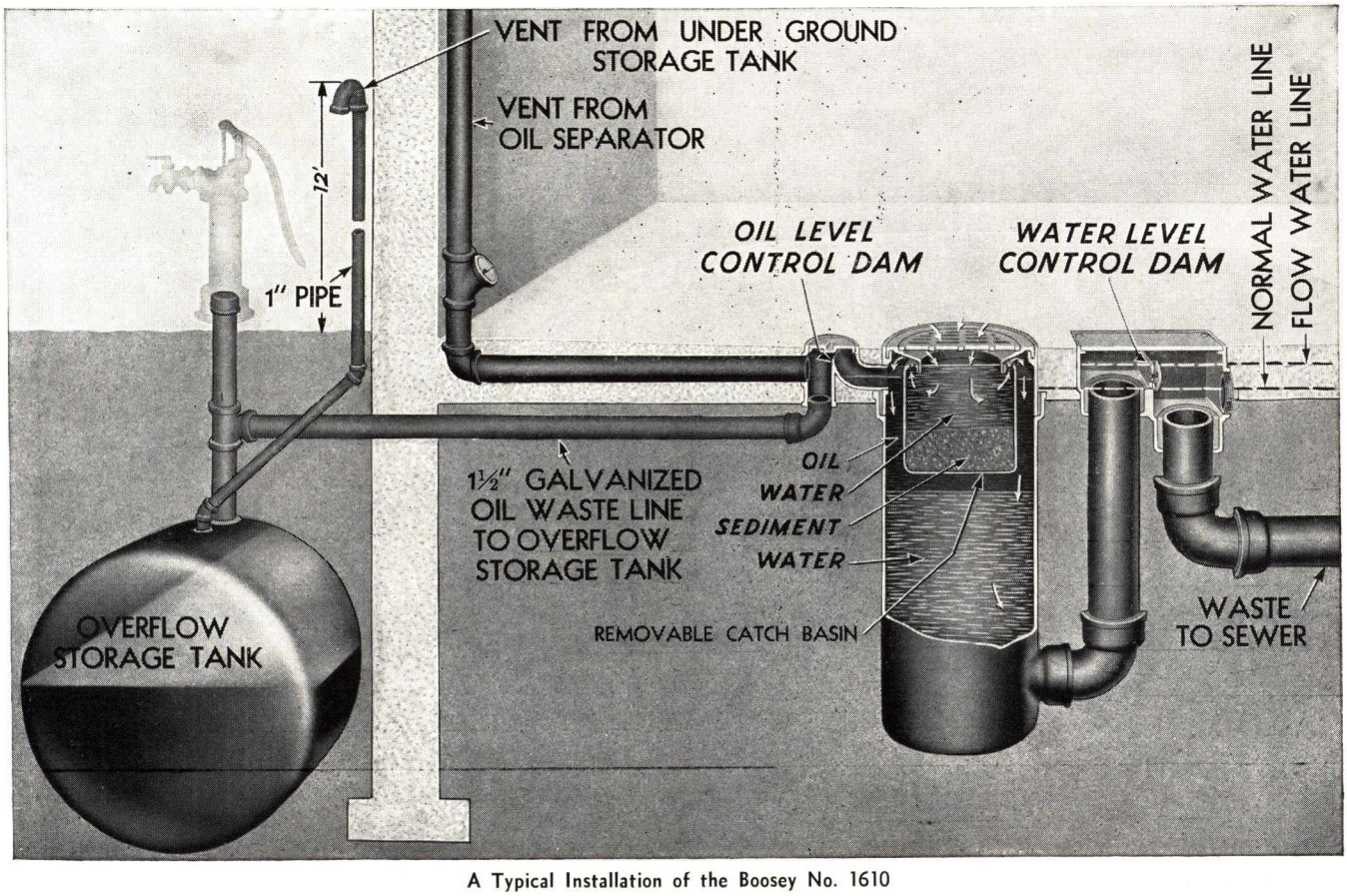
By this method of separation, volatile liquids in the separator seldom exceed 4 ins. in depth. Crank case oil, being heavier than gasoline, will average approximately 11 ins. in depth.

The separator is constructed of cast iron, permanent, durable, and leakproof. All parts, vent and waste connections are accessible. Removable covers on both the oil level control chamber and the water level control chamber provide easy access for inspection. The E.X. cast iron strainer is removable as is the internal catchbasin, which collects all sand and grit. The catchbasin requires emptying only as often as indicated by the slowing of the flow through the separator. The occasional emptying of the catchbasin and the periodic removal of oil from the storage tank is usually the extent of the necessary maintenance.

The Boosey No. 1610 will provide adequate drainage for the average sized washrack and will accommodate a flow of 20 gal. per minute. This is comparable to the entire discharge of two standard ¾-in. hose nozzles.

Approximate shipping weight, 300 lbs. List price, $118.75

When Separator is water-sealed, it prevents all volatile liquids, such as gasoline, benzine, naphtha, etc., from entering the public sewer.



A Typical Installation of the Boosey No. 1610

COMPOUND INJECTOR & SPECIALTY CO.

GEORGE J. DEHN, S. E., President

Inventors, Designers and Sole Manufacturers Dehn's Sanitary Safeguards

THE PIONEERS SINCE 1897

LONG DISTANCE TELEPHONE
Austin 1861, 1862

419-421 North Laramie Avenue, CHICAGO, ILL.

CABLE ADDRESS
"Compound Chicago"

The Original-Dehn's "PEERLESS" "RE-TAR-DO" FLOCONTROL—"CLOG"—Heavy Duty Garage and Floor Drain with Refuse Separator and Retainer

ELIMINATES CLOGGED DRAINAGE SYSTEMS IN THE PAST QUARTER OF A CENTURY UNIVERSALLY INSTALLED

For installation in buildings where the flowing water carries mud, sand and other refuse, the Original Dehn's "PEERLESS" Heavy Duty Floor Drains are the most convenient, practical, satisfactory and economical. The bar grate and body are extra heavy, for heavy duty furnished with RE-TAR-DO "FLOCONTROL" baffle and with 4 in. outlet only.

Dehn's "PEERLESS" Drains should be installed in every automobile garage, gasoline station and industrial building where automobiles are housed and maintained as a shop for the maintenance and repairs of automobiles as a business or storage of automobiles. The mud, sand and other refuse washed from automobiles, vehicles, etc., will accumulate in the receptacle. The "PEERLESS" drain is constructed on the RE-TAR-DO "FLOCONTROL" principle, hence the refuse cannot be forced out of the Retainer. The accumulated refuse and solids, when filled to capacity in the receptacle, will "CLOG" the Garage Drain, stopping all the water from flowing through the drain, indicating that the solids and refuse must be removed to permit the drain to function again. Eliminate refuse in Drainage Systems.

Dehn's "PEERLESS" Heavy Duty Garage Drainage Systems permit a continuous circulation of air through the air chamber in the Garage Drains regardless of the doors or windows being closed; the fresh air inlet at the side of the building permits the air to circulate continuously through the air chamber of the drain and escape through the vent stack through the roof; hence no danger of gas fumes in the garage or building.

Fig. No. 0-60-A—Furnished with Automatic Back Water Valve with 4-in. iron pipe threaded brass cleanout plug, with 4-in. hub end outlet, iron top and strainer. Heavy Duty. Each $44.00.

Fig. No. 0-6025-A—Furnished less Automatic Back Water Valve, with 2-in. iron pipe threaded brass cleanout plug, with 4-in. spigot end outlet, iron top and strainer. Heavy duty. Each $36.00.

Fig. No. 0-6050-A—Furnished less Back Water Valve with 2-in. iron pipe threaded brass cleanout plug, with 4-in. hub end outlet iron top and strainer. Heavy Duty. Each $36.00.

Fig. No. 0-6055-A—Furnished with 4-in. hub side outlet, iron top and strainer. Heavy Duty. Each $26.00.

Fig. No. 0-6060-A—Furnished with 4-in. hub bottom outlet, iron top and strainer. Heavy duty. Each $26.00.

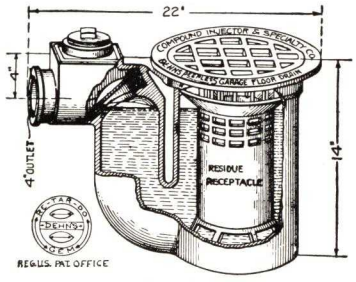
Fig. No. 0-6065-A—Furnished with 4-in. iron pipe threaded side outlet, iron top and strainer. Heavy Duty. Each $26.00.

Fig. No. 0-6070-A—Furnished with 4-in. iron pipe threaded bottom outlet, iron top and strainer. Heavy Duty. Each $26.00.

Fig. No. 0-6075-A—Furnished with Water-tight Expansion Joint Shelf, with 4-in. Hub Side Outlet, iron top and strainer. Heavy Duty. Each $36.00.

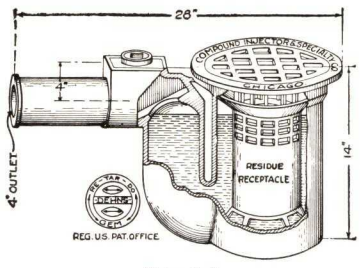
Dehn's "PEERLESS" Heavy Duty	Fig. No. 0-60	Fig. No. 0-6025	Fig. No. 0-6050	Fig. No. 0-6055
Diameter of top, in.	12	12	12	12
Depth over-all, in.	14	14	14	14
Size of outlet, in.	4	4	4	4
Length over-all, in.	22	28	22	13
Approximate weight, lbs.	100	100	100	90
Price, A, iron top and strainer, each	$44.00	$36.00	$36.00	$26.00
Price, B, brass top and strainer, each	78.00	67.00	67.00	57.00

Dehn's "PEERLESS" Heavy Duty	Fig. No. 0-6060	Fig. No. 0-6065	Fig. No. 0-6070	Fig. No. 0-6075
Diameter of top, in.	12	12	12	12
Depth over-all, in.	14	14	14	14
Size of outlet, in.	4	4	4	4
Length over-all, in.	13	13	13	13
Approximate weight, lbs.	90	90	90	100
Price, A, iron top and strainer, each	$26.00	$26.00	$26.00	$36.00
Price, B, brass top and strainer, each	57.00	57.00	57.00	67.00



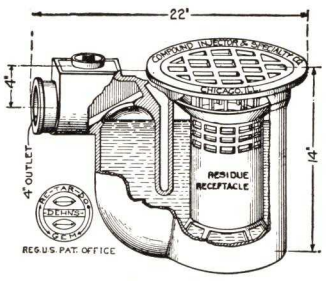
Patented

Fig. No. 0-60 With Automatic Back Water Valve With 4-in. Iron Pipe Threaded Brass Cleanout Plug



Patented

Fig. No. 0-6025 With 4-in. Spigot End Outlet Without Backwater Valve



Patented

Fig. No. 0-6050 With 4-in. Hub Outlet Without Back Water Valve

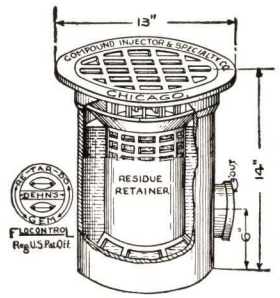


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Fig. No. 0-6055 With 4-in. Hub Side Outlet

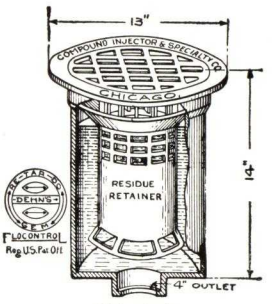

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Fig. No. 0-6060 With 4-in. Hub Bottom Outlet

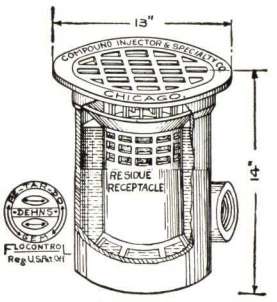

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Fig. No. 0-6065 With 4-in. Iron Pipe Threaded Side Outlet

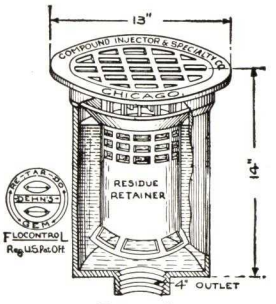

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Fig. No. 0-6070 With 4-in. Iron Pipe Threaded Bottom Outlet

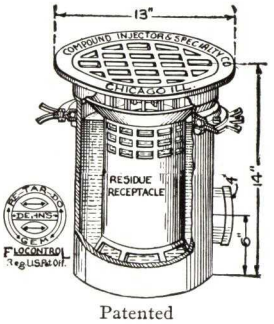

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Fig. No. 0-6075 With 4-in. Hub Side Outlet With Water-tight Expansion Joint Shelf

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RE-TAR-DO DEHN'S GEM

FLOCONTROL

Reg. U. S. Pat. Office

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The Original-Dehn's "PEERLESS" "RE-TAR-DO" FLOCONTROL—"CLOG"—Heavy Duty Garage and Floor Drains with Refuse Separator and Retainer

Eliminate Clogged Drainage Systems and Petromortis in Automobile Garages

The Original Dehn's "PEERLESS" "DEEP SEAL" Floor Drain with Water-Tight Expansion Joint Shelf and Anchor.

Dehn's Floor Drains are especially designed for fireproof and concrete constructed buildings. In the past, it has been experienced when installing the ordinary floor drains, in concrete with cement, mosaic or tile floors, it is impossible to make a water-tight joint on the floor at the drain. This results in the water leaking through the ceiling on the floor below, damaging merchandise or other materials and causing serious loss.

Dehn's "PEERLESS" "DEEP SEAL" Floor Drains with these improvements with water-tight expansion joint shelf and anchors are positively guaranteed that the water will not find an opening at the drain to leak through the ceiling.

Dehn's fixtures are indispensable for use in toilets, bathrooms, laundries, swimming pools, factories, and store buildings, etc., where the drain is installed above the basement. Install these. They have no equal. No weepholes to permit the sewerage to back up and contaminate the surface around the drains, a dangerous and hazardous construction.

Dehn's water-tight expansion joint-shelf and anchors can be furnished for every type and size of "PEERLESS" line Floor Drains.

Fig. No. 0-6080-A—Furnished with Water-tight Expansion Joint Shelf, With 4-in. Hub Bottom Outlet, iron top and strainer. Heavy Duty. Each $36.00.

Fig. No. 0-6085-A—Furnished with Water-tight Expansion Joint Shelf, With 4-in. iron pipe threaded side outlet, iron top and strainer. Heavy Duty. Each $36.00.

Fig. No. 0-6090-A—Furnished with Water-tight Expansion Joint Shelf, With 4-in. iron pipe threaded bottom outlet, irop top and strainer. Heavy Duty. Each $36.00.

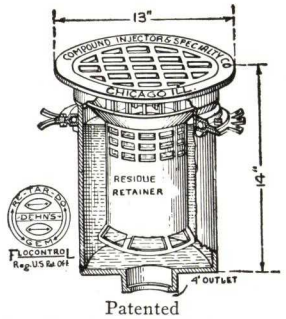

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Fig. No. 0-6080 With 4-in. Hub Bottom Outlet With Water-tight Expansion Joint Shelf

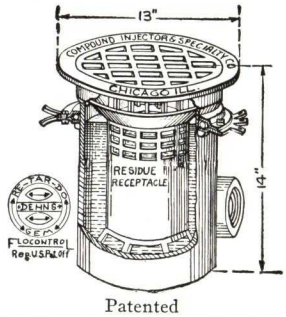

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Fig. No. 0-6085 With 4-in. Iron Pipe Side Outlet With Water-tight Expansion Joint Shelf

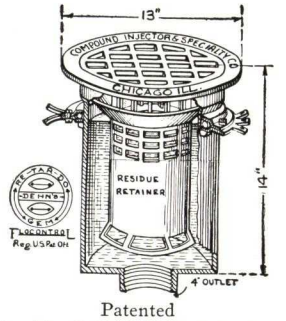

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Fig. No. 0-6090 With 4-in. Iron Pipe Bottom Outlet With Watertight Expansion Joint Shelf

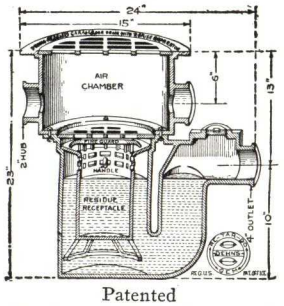

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Fig. No. 0-61 With Vented Hood With 4-in. Hub Side Outlet

Dehn's "PEERLESS" Heavy Duty	Fig. No. 0-6080	Fig. No. 0-6085	Fig. No. 0-6090
Diameter of top, in.	12	12	12
Depth over-all, in.	14	14	14
Size of outlet, in.	4	4	4
Length over-all, in.	13	13	13
Approximate weight, lbs.	100	100	100
Price, A, iron top and strainer, each	$36.00	$36.00	$36.00
Price, B, brass top and strainer, each	67.00	67.00	67.00

Dehn's "PEERLESS" Heavy Duty	Fig. No. 0-61	Fig. No. 0-6125	Fig. No. 0-6150	Fig. No. 0-6175
Diameter of top, in.	15	15	15	15
Depth over-all, in.	23	23	23	23
Size of outlet, in.	4	4	4	4
Size two vent hubs, in.	2	2	2	2
Length over-all, in.	24	24	18	24
Approximate weight, lbs.	175	200	160	175
Price, A, iron top and strainer, each	$48.00	$60.00	$44.00	$56.00

THE ORIGINAL—WITH VENTED HOOD—FIG. NO. 0-62—DEHN'S "PEERLESS" "RE-TAR-DO" "FLOCONTROL" "CLOG" HEAVY DUTY GARAGE AND FLOOR DRAIN WITH REFUSE SEPARATOR AND RETAINER ELIMINATE CLOGGED DRAINAGE SYSTEMS

Diameter of top, in.	20	20	21	21	21	21
Depth over-all, in.	20	24	30	38	46	54
Size of waste outlet, in.	4	4	4	4	4	4
Two vent hubs, in.	2	2	4	4	4	4
Approximate weight, lbs.	235	250	375	425	500	600
Price, A, iron top and strainer, each	$60.00	$70.00	$90.00	$110.00	$130.00	$150.00

In the past quarter of a century our Dehn's "PEERLESS" Garage Floor Drains with Refuse Separators and Retainers have been universally installed for every type of installation and that they have proven their worth is clearly demonstrated by the infringers and imitators who are attempting to duplicate our "PEERLESS" Garage Floor Drains and other merchandise of our manufacture.

Use Our Schedule for Capacities and You Will Succeed in Obtaining the Desired Results.

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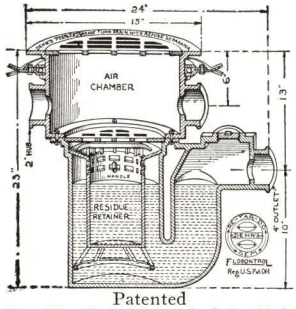

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Fig. No. 0-6125 With 4-in. Hub Side Outlet With Watertight Expansion Joint Shelf, With Vented Hood

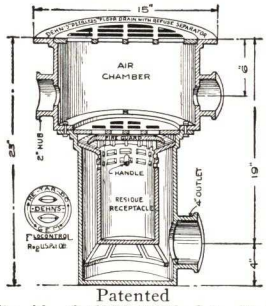

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Fig. No. 0-6150 With 4-in. Hub Side Outlet With Vented Hood

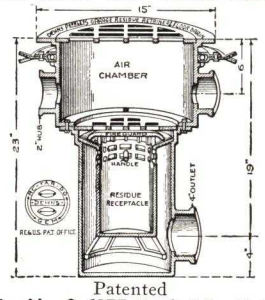

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Fig. No. 0-6175 With 4-in. Hub Side Outlet With Watertight Expansion Joint Shelf, With Vented Hood

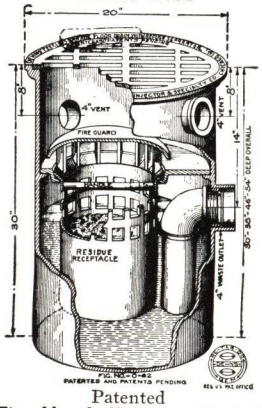

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Fig. No. 0-62—The Original Dehn's "PEERLESS" Heavy Duty Garage and Floor Drains With Vented Hood

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SPECIFICATIONS AND SCHEDULE OF CAPACITIES OF GARAGE DRAINAGE INSTALLATION SYSTEMS

The Original with Vented Hood Fig. No. 0-62—Dehn's "PEERLESS" Heavy Duty Garage and Floor Drain with Refuse Separator and Retainer

RE-TAR-DO DEHN'S GEM FLOCONTROL

Reg. U. S. Pat. Office

Eliminate refuse in Garage Drainage Systems and Petromortis in Automobile Garages, Shops for Maintenance and Repair of Automobiles, and Industrial Buildings. The exhaust fumes and gases from automobiles kill annually a great many motorists and engineers. Install the Original Vented Hood Dehn's "PEERLESS" Heavy Duty Garage and Floor Drain with Refuse Separators and Retainers. They are constructed on the RE-TAR-DO FLOCONTROL *principle.*

Class A.—Where not more than one automobile is housed, one 15-in. diameter of top and 22 in. deep "PEERLESS" Garage Drain shall be installed. Fig. No. 0-61.

Class B.—Where from one to three automobiles are housed, one 20 in. diameter of top and 20 in. deep "PEERLESS" Garage Drain shall be installed. Fig. No. 0-62, 20x20 in.

Class C.—Where from three to six automobiles are housed, one 20 in. diameter of top and 24 in. deep "PEERLESS" Garage Drain shall be installed. Fig. No. 0-62, 20x24 in.

Class D.—Where from six to fifteen automobiles are housed, one 21 in. diameter of top and not less than 30 in. deep "PEERLESS" Garage Drain shall be installed. Fig. No. 0-62, 21x30 in.

Class E.—Where from fifteen to twenty-five automobiles are housed, one 21 in. diameter of top and not less than 38 in. deep "PEERLESS" Garage Drain shall be installed. Fig. No. 0-62, 21x38 in.

Class F.—Where from twenty-five to thirty-five automobiles are housed, one 21 in. diameter of top and not less than 46 in. deep "PEERLESS" Garage Drain shall be installed. Fig. No. 0-62, 21x46 in.

Class G.—Where from thirty-five to forty-five automobiles are housed, one 21 in. diameter of top and not less than 54 in. deep "PEERLESS" Garage Drain shall be installed. Fig. No. 0-62, 21x54 in.

Class H.—Where from forty-five to sixty automobiles are housed, three 21 in. diameter of top and not less than 30 in. deep "PEERLESS" Garage Drain shall be installed. 3 Fig. No. 0-62, 21x30 in.

Class I.—Where from sixty to seventy-five automobiles are housed, three 21 in. diameter of top and not less than 38 in. deep "PEERLESS" Garage Drains shall be installed. 3 Fig. No. 0-62, 21x38 in.

Class J.—Where from seventy-five to one hundred automobiles are housed, three 21 in. diameter of top and not less than 46 in. deep "PEERLESS" Garage Drains shall be installed. 3 Fig. No. 0-62, 21x46 in.

Class K.—Where from one hundred to three hundred automobiles are housed, three 21 in. diameter of top and not less than 54 in. deep "PEERLESS" Garage Drains shall be installed. 3 Fig. No. 0-62, 21x54 in.

Schedule of Capacity governed by specifications as above and referred to as authority

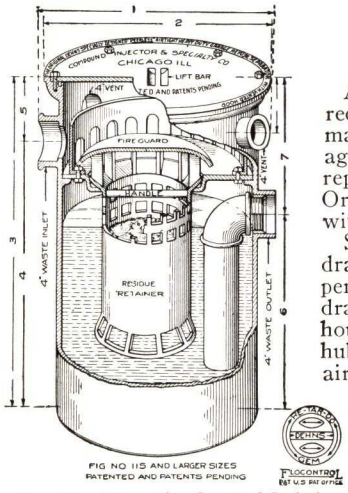

Fig. No. 115—The Original Dehn's Specially Designed "PEERLESS" Air-Tight Heavy Duty Refuse Separators With Automatic Vented Hood

The Original Combination with Automatically Vented Hood—Fig. No. 115—Dehn's Specially Designed "PEERLESS" Air-Tight Heavy Duty Garage and Floor Drain with Refuse Separator and Retainer

Architects, Sanitary Engineers and Contractors protect the health and life of their clients by recommending and installing the original with vented hood Dehn's "PEERLESS" Heavy Duty Automatically Vented Garage Drainage System, a practical, economical and satisfactory garage drainage system that will eliminate petromortis in automobile garages, shops for the maintenance and repair of automobiles, and industrial buildings where automobiles are housed or stored. Install the Original Dehn's Specially Designed "PEERLESS" Air-Tight Heavy Duty Garage and Floor Drain with Refuse Separator and Retainer. Their installation protects health, life and property.

Specially designed to be installed in basements or pits of buildings and garages when floor drains are required to be located on several floors above the first floor. This construction will permit discharging any number of Floor Drains into the "PEERLESS" Air-Tight Specially designed drain. This system of drainage installation for large and high buildings where automobiles are housed above the first floor has proven very satisfactory and economical. With the two 4-in. vent hub openings extended to the outside of the building it permits a continuous circulation of fresh air through the air chamber in the Separator.

THE ORIGINAL WITH AUTOMATICALLY VENTED HOOD—FIG. NO. 115—DEHN'S SPECIALLY DESIGNED "PEERLESS" AIR-TIGHT HEAVY DUTY GARAGE REFUSE SEPARATOR AND RETAINER

Fig. No. 115—"PEERLESS" Air-Tight Separators	Class L	Class M	Class N
Diameter of top, in.	21	21	21
Depth over-all, in.	38	46	54
Size of waste inlet and outlet, in.	4	4	4
Two vent hubs, in.	4	4	4
Approximate weight, lbs.	450	550	650
Price, A, iron top and strainer, each	$150.00	$200.00	$250.00

SPECIFICATIONS AND SCHEDULES OF CAPACITIES OF GARAGE DRAINAGE INSTALLATION SYSTEMS

The Original with Automatically Vented No. 115—Dehn's Specially Designed "PEERLESS" Air-Tight Heavy Duty Garage and Floor Drain with Refuse Separator and Retainer

Class L.—Where from fifteen to seventy-five automobiles are housed, one 21 in. diameter of top and not less than 38 in. deep "PEERLESS" Garage Drains shall be installed. 1 Fig. No. 115, 21x38 in. Air-Tight RE-TAR-DO FLOCONTROL Refuse Separators.

Class M.—Where from twenty-five to one hundred automobiles are housed, one 21 in. diameter of top and not less than 46 in. deep "PEERLESS" Garage Drains shall be installed. 1 Fig. No. 115, 21x46 in. Air-Tight RE-TAR-DO FLOCONTROL Refuse Separators.

Class N.—Where from seventy-five to two hundred automobiles are housed, one 21 in. diameter of top and not less than 54 in. deep "PEERLESS" Garage Drains shall be installed. 1 Fig. No. 115, 21x54 in. Air-Tight RE-TAR-DO FLOCONTROL Refuse Separators.

When garage or other establishments to be erected will house a greater number of automobiles or employ a greater number of persons than this schedule provides for, the size and number of Garage and Floor Drains for other establishments shall be increased according to this schedule to any number of automobiles housed or persons employed, the number and size of Drains to be determined by the City Department and by one in authority having this in charge.

The receiving hood is provided with vent hub openings on either side from which vent pipes shall be extended to the outside of the building to allow fumes or gases from the waste gasoline, oils, grease and refuse to escape.

Schedule of Capacity governed by specifications as above and referred to as authority.

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RE-TAR-DO DEHN'S GEM FLOCONTROL
Reg. U. S. Pat. Office

A New Invention and Departure from Past and Present Methods

DISTINCTIVELY DIFFERENT

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Reg. U. S. Pat. Office

The Original Dehn's "PEERLESS" RE-TAR-DO FLOCONTROL CLOG Heavy Duty Garage Floor Drain Combined with Oil, Gasoline, Grease and Refuse Separator with Heavy Duty Bar Grate or with Air-Tight Heavy Duty Cover for Installation Flush with the Floor. Automatically Vented.

Automatically Operated in Separating and Retaining Oils, Grease and Refuse.

The air chamber is provided with hub vent openings on either side of the vent hood from which vent pipes shall be extended to the outside of the building to allow the fumes and gases from the waste gasoline, oils, grease and refuse to escape. The air tight air chamber is provided regularly with 2-in. hub waste inlet opening for connection with floor drains or other fixtures that may be required to be installed on the first floor and on all floors above the first floor. 4-in. hub waste inlet furnished when specified, at small additional cost. All waste, vent and oil lines are connected with the Oil Separator below the floor, eliminating pipe lines and other hazardous obstructions from extending above the floor. Every oil, gasoline, grease and refuse separator shall be provided with vent openings in the air chamber above the water line, from which vent pipes shall be extended to the outside of the building to allow the fumes and gases to escape, to prevent accidents and explosions resulting from the gasoline, oil and grease fumes, eliminating dangerous and hazardous installations.

The "PEERLESS" RE-TAR-DO FLOCONTROL Oil Separators are constructed along the same lines as the Original Dehn's "PEERLESS" RE-TAR-DO FLOCONTROL CLOG Heavy Duty Garage and Floor Drains with Refuse Separator and Retainer and universally installed for more than a quarter of a century and are continuously being installed for every type of installation.

For installation in all establishments where the flowing water carries the gasoline, oils, grease and other inflammable materials, the mud, sand and other refuse washed from automobiles, vehicles, etc., and accumulate in the receptacle. These separators are constructed on the RE-TAR-DO FLOCONTROL principle. All the solids and refuse discharged into the separator will remain in the receptacle. The accumulated refuse and solids, when filled to capacity in the receptacle, will "CLOG" the separator, stopping all the water from flowing through the separator, indicating that the solids and refuse must be removed to permit the separator to function again. The 2-in. vent hub openings properly connected will permit the circulation of a continuous flow of fresh air through the air chamber in the separator to purify the air in the garage to prevent accidents and avoid explosions.

This construction Automatically separates and discharges the gasoline, oils and naphtha through the outlet opening into the oil line and the storage tank.

The "PEERLESS" RE-TAR-DO FLOCONTROL Separator should be installed in every automobile garage, gasoline station, dye, cleaning or other establishments where gasoline, oils or other inflammable materials are used or stored. The bar grate and body are heavy duty to withstand the heavy weight of the cars and trucks driving over them. Operation is positive against either hot or cold liquid temperatures, for the separation and retention of gasoline, oils, naphtha, grease, fats or paraffin from entering sewer pipe lines. The separators are furnished with 4-in. hub waste outlet opening.

All hydraulic and sanitary laboratories that have tested our Oil, Gasoline and Grease Separators and Retainers have proven them to be 95% or more efficient in separating and retaining oils, gasoline, grease and refuse.

You will observe our Oil, Gasoline, Grease and Refuse Separators and Retainers are furnished complete for installation. No valves to regulate. No floats to depend upon. Automatically adjusted and vented. No floor obstruction. Only one fixture to install. "This is a floor drain and Oil Separator combined." Deep Seal waste outlet. Eliminating leaky joints, all confusion and hazards. The most convenient, practical, efficient, sanitary safety, satisfactory and economical and function 100%. They are the best all around.

Architects and Engineers (Sanitary and Construction) in cities and in localities where sewage disposal and septic tank systems are in operation and where rigid Plumbing and Drainage Ordinances and Inspection exist, experience that it shall be unlawful to use or attach any garage, dye, cleaning or other establishment with the public sewers where gasoline, oils or other inflammable materials are used, unless a system of mud, gas, oils, grease and refuse (cast iron) separators are installed.

Recommended by Sanitary Engineers, Health Authorities, Fire Prevention or Sanitary Bureaus and Plumbing Inspectors.

Dehn's "PEERLESS" Garage Drains combined with Oil Separators are constructed on the RE-TAR-DO FLOCONTROL principle, preventing gas, oils, grease and refuse from finding their way into the waste pipes and sewer, eliminating clogged sewerage disposal and septic tank systems.

Sewerage Commissioners' Chief Engineering Research Chemists in cities operating sewerage disposal and septic tank systems welcome this great improvement, eliminating gas, oils, grease and refuse in waste pipes, sewerage disposal and septic tank systems.

Use Our Schedule for Capacities and You Will Succeed in Obtaining the Desired Results—*Quality and Efficiency First.*

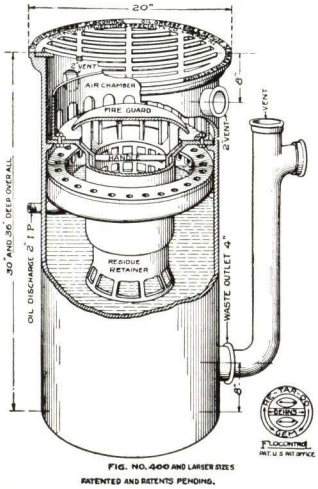

FIG. NO. 400 AND LARGER SIZES
PATENTED AND PATENTS PENDING.

Fig. No. 400—Dehn's "PEERLESS" RE-TAR-DO FLOCONTROL Automatic Gas, Oil and Refuse Separator with Vented Hood and Heavy Duty Bar Grate

For installation in public and private garages, gasoline stations and industrial buildings	Fig. No. 400 No. 30 Heavy duty	Fig. No. 400 No. 36 Bar grate
Diameter of top, in.	20	20
Depth over all, in.	30	36
Size of waste outlet, in.	4	4
Size of oil outlet, in.	2	2
Size two vent hubs, in.	2	2
Flow of water per hour, gals.	260	380
Approximate weight, lbs.	395	450
Price, A, heavy duty bar grate, each	$132.00	$148.00

For installation in establishments where gasoline, oils or other inflammable materials are used or stored	Fig. No. 401 No. 30 Heavy duty	Fig. No. 401 No. 36 Air-tight cover
Diameter of top, in.	20	20
Depth over all, in.	30	36
Size of waste inlet, in.	2	2
Size of waste outlet, in.	4	4
Size of oil outlet, in.	2	2
Size two vent hubs, in.	2	2
Flow of water per hour, gals.	260	380
Approximate weight, lbs.	395	450
Price, A, air-tight heavy duty cover, each	$132.00	$148.00

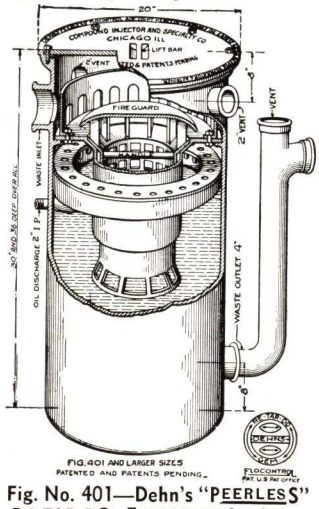

FIG. 401 AND LARGER SIZES
PATENTED AND PATENTS PENDING.

Fig. No. 401—Dehn's "PEERLESS" RE-TAR-DO FLOCONTROL Automatic Gas, Oil and Refuse Separator with Vented Hood and Air-Tight Heavy Duty Cover

N. B.—Dehn's "PEERLESS" Garage Drains are approved and recommended by the Boards of Health and Fire Prevention Bureaus of all Up-to-Date cities where rigid plumbing and drainage ordinances and inspection exist.

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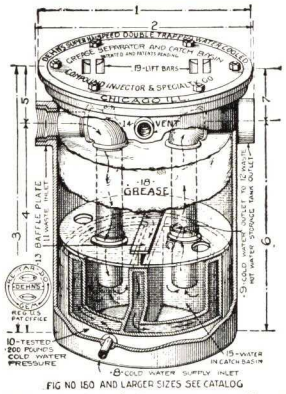
The Original Dehn's "SUPER HI-SPEED" RE-TAR-DO FLOCONTROL Heavy Duty Double Trapped Water Chilled and Non-Water Chilled Grease Separators and Retainers With Extra High Speed Coagulation

RE-TAR-DO DEHN'S GEM FLOCONTROL

Reg. U. S. Pat. Office

Dehn Patented Round Body Deep Seal Type

Non-Foul Air By-Pass, Heavy Duty 95 to 99.1% Test Efficiency



(Patented and Patents Pending)

Fig. No. 150 and Larger Sizes Dehn's "SUPER HI-SPEED" Water Chilled Grease Separator and Retainer. Tested 200 Lbs. Cold Water Pressure

Regularly fitted with separate inside pre-tested extra heavy Cold Water Chilling Units tested 200 lbs. hydrostatic pressure. Water pressure regulator not required on supply.

Recommended especially for U. S. Government barracks dining rooms, prison mess halls, restaurants, large cafeterias, hotel kitchens, etc. Made in a graduated range of sizes to "receive direct" and "pass indirect" all liquid disposal and elimination from kitchen apparatus, scalding and cooking utensils, etc. Operation is positive against either hot or cold liquid temperatures, for the separation and retention of grease, fats, oils, naphtha or paraffin from entering sewer pipe lines.

Grease capacities of all traps are rated and measured conforming to U. S. standard governing weights and measures. Regularly furnished painted finish with threaded inlets and outlets. Also hub connections when specified.

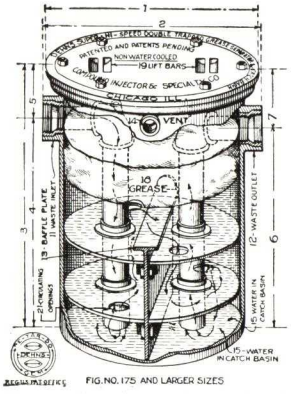
Tests and Schedules—All hydraulic and sanitary laboratories that have tested our Grease Separators and Retainers have proved them to be 95% or more efficient in separating and retaining oils, grease and refuse.

A part of the report of the Milwaukee Sewerage Commission is reproduced below.

Milwaukee, Wisconsin, March 29, 1933

REPORT OF THE MILWAUKEE SEWERAGE COMMISSIONER CHIEF ENGINEERING RESEARCH CHEMIST LABORATORY TEST OF DEHN'S "SUPER HI-SPEED" RE-TAR-DO FLOCONTROL DOUBLE TRAPPED WATER CHILLED GREASE SEPARATOR AND RETAINER

Date 1932 Nov.	Gals. Water Used in Test	Temp. of Water Beginning of Run °F.	Lbs. of Grease Used in Test	Lbs. of Grease Recovered	¾" Water Connection Under Full Pressure 60 lbs.	Cocler Water Temp. in °F.	Cocler Water Temp. out °F.	Temp. in Trap End of Run °F.	Duration of Test in Minutes	Rate of Flow G.P.H.	Percentage of Grease Recovered in Trap	Remarks
10	100	180	10	9.91		54	66	163	27.5	220	99.1	
10	100	178	10	9.87		54	66	161	20.0	300	98.7	Net Capacity 16 gals. water retained in retainer.
14	100	183	10	9.89		69	78	165	15.0	400	98.9	
14	100	181	10	9.78		53	61	161	15.0	400	97.8	
14	100	180	10	9.60		69	79	160	12.0	500	96.0	Manufacturer's flow rating 600 G. P. H.
14	100	180	10	9.58		55	68	162	10.0	600	95.8	
15	100	180	10	9.35		53	68	161	8.5	700	93.5	Full Trap capacity.



(Patented and Patents Pending)

Fig. No. 175 and Larger Sizes Dehn's "SUPER HI-SPEED" Non-Water Chilled Grease Separators and Retainers

THE ORIGINAL—FIG. NO. 150 AND FIG. NO. 175 AND LARGER SIZES DEHN'S "SUPER HI-SPEED" RE-TAR-DO FLOCONTROL HEAVY DUTY DOUBLE-TRAPPED WATER CHILLED AND NON-WATER CHILLED GREASE SEPARATORS AND RETAINERS

Dehn's "SUPER HI-SPEED" Water Chilled Separators				Grease cap., lbs.	Flow water per hour, gals.	Net cap. water retained, gals.	1 Diam. of top, in.	3 Depth over all, in.	4-6 Floor to center of waste, inlet and outlet openings, in.	5-7 Top to center of waste, inlet and outlet openings, in.	8-9 Cold water supply inlet and outlet, in.	11-12 Waste inlet and outlet openings, in.	14 Local vent openings, in.	Dehn's "SUPER HI-SPEED" Non-Water Chilled Separators			
Fig. No. 150 and larger sizes	Number meals served per day	*Price painted each	Approx. weight, lbs.											Approx. weight, lbs.	*Price painted each	Number meals served per day	Fig. No. 175 and larger sizes
150-A	275	$100.00	300	45	252	8	20	20	16	4	1¼	2	2	240	$ 80.00	160	175-A
151-A	380	125.00	360	70	278	11	20	24	20	4	1¼	3	2	260	100.00	250	176-A
152-A	562	165.00	420	96	408	16	20	30	25	5	1¼	3	2	300	130.00	385	177-A
153-A	750	250.00	480	130	560	20	20	36	31	5	1¼	3	2	350	165.00	525	178-A
154-A	1290	580.00	1500	238	1032	54	32	36	29	7	2	4	3	900	450.00	970	179-A
155-A	1860	680.00	2000	348	1488	69	32	42	34	8	2	4	3	1050	500.00	1400	180-A
156-A	2550	780.00	2150	535	2040	90	32	48	38	10	2	6	3	1200	600.00	2000	181-A
157-A	3950	900.00	2500	738	3160	107	38	48	38	10	2	6	4	1300	685.00	2975	182-A
158-A	4800	1030.00	2800	903	3840	132	38	54	44	10	2	6	4	1500	790.00	3600	183-A
159-A	5700	1180.00	3100	1067	4560	157	38	60	50	10	2	6	4	1750	940.00	4275	184-A

*Price painted inside and outside. Furnished enameled inside. Enameled inside and outside. Prices on application.

Use Our Schedule for Capacities and You Will Succeed in Obtaining the Desired Results

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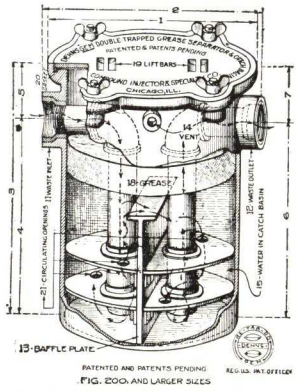
RE-TAR-DO DEHN'S GEM FLOCONTROL
Reg. U. S. Pat. Office

The Original Dehn's "GEM" RE-TAR-DO FLOCONTROL Double Trapped Grease Separators and Retainers Water Chilled and Non-Water Chilled

We relieve the Architects, Sanitary and Construction Engineers of the responsibility of any guess work in selecting the kind and size Grease and Oil Separators for all installations.

1897 ☆ 1938 DEHN'S STANDARD SANITARY PRODUCTS THE PIONEERS
Reg. U. S. Pat. Office



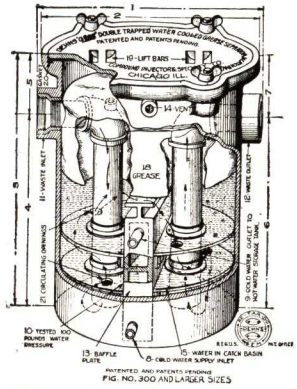
(Patented and Patents Pending)
Fig. No. 200 and Larger Sizes, Dehn's "GEM" FLOCONTROL Double Trapped Non-Water Chilled Grease Separator

IMPORTANT—Size of Inlet and Outlet Waste Openings

The Original Dehn's "GEM" RE-TAR-DO FLOCONTROL Separators furnished with 1½-in. and larger sizes iron pipe threaded or hub connections conveniently located for connecting with the kitchen sinks, dishwashing machines, utensil washing sinks, glass rinsing machines or vegetable washing vats or other similar fixtures.

The waste opening sizes shown in our catalog are based on thorough tests made with all sizes of separators using various volume of flow gallons water per hour which resulted in retaining 95% and more grease and refuse in the Separators.

These tests point out the importance, when ordering our grease separators and retainers that you adhere strictly to the sizes and capacities appearing opposite each Figure Number shown in the catalog.



(Patented and Patents Pending)
Fig. No. 300 and Larger Sizes, Dehn's "GEM" FLOCONTROL Double Trapped Water Chilled Grease Separator

THE ORIGINAL—FIG. NO. 200 AND FIG. NO. 300 AND LARGER SIZES DEHN'S "GEM" RE-TAR-DO FLOCONTROL DOUBLE TRAPPED NON-WATER CHILLED AND WATER CHILLED GREASE SEPARATORS AND RETAINERS

Dehn's "GEM" FLOCONTROL Non-Water Chilled Separators													Dehn's "GEM" FLOCONTROL Water Chilled Separators			
Fig. No. 200 and larger sizes	Number meals served per day	*Price painted each	Approx. weight lbs.	Grease capacity lbs.	Flow water per hour gallons	Net capacity water retained gallon	1 Diam. of top inches	3 Depth over all inches	4–6 Floor to center of waste inlet and outlet openings inches	5–7 Top to center of waste inlet and outlet openings inches	8–9 Cold water supply inlet and outlet inches	11–12 Waste inlet and outlet openings inches	14 Local vent opening inches	Approx. weight lbs.	*Price painted each	Number meals served per day	Fig. No. 300 and larger sizes
200-A	55	$ 25.00	85	13	80	3½	15	13	9	4	¾	1½	1½	100	$ 38.00	75	300-A
201-A	75	28.00	100	21	120	4½	15	15	11	4	¾	1½	1½	115	42.00	100	301-A
202-A	110	36.00	110	32	180	6	15	18	14	4	¾	2	1½	125	50.00	150	302-A
203-A	185	46.00	140	45	240	8	15	24	20	4	¾	2	1½	175	65.00	250	303-A
204-A	260	60.00	165	63	280	10	15	30	26	4	¾	2	1½	200	80.00	350	304-A
205-A	160	80.00	240	52	252	10	20	20	16	4	1¼	2	2	285	95.00	260	305-A
206-A	250	100.00	260	62	278	13	20	24	20	4	1¼	3	2	300	115.00	330	306-A
207-A	385	130.00	280	110	408	18	20	30	26	4	1¼	3	2	325	150.00	512	307-A
208-A	525	165.00	300	140	560	23	20	36	31	5	1¼	3	2	330	200.00	700	308-A
209-A	305	115.00	280	65	310	16	23	24	19	5	1¼	3	2	390	140.00	390	309-A
210-A	430	160.00	340	118	448	22	23	30	25	5	1¼	3	2	425	185.00	575	310-A
211-A	610	195.00	375	168	648	28	23	36	31	5	1¼	4	2	485	220.00	810	311-A
212-A	350	145.00	320	112	428	21	25	24	19	5	1¼	4	2	410	175.00	535	312-A
213-A	700	200.00	380	173	672	28	25	30	25	5	1¼	4	2	490	235.00	825	313-A
214-A	910	250.00	425	212	910	36	25	36	31	5	1¼	4	2	540	285.00	1120	314-A
215-A	970	450.00	900	238	1032	54	32	36	28	8	2	4	3	1350	500.00	1290	315-A
216-A	1400	500.00	1050	348	1488	69	32	42	34	8	2	4	3	1600	575.00	1860	316-A
217-A	2000	600.00	1200	535	2040	90	32	48	38	10	2	6	3	1850	650.00	2550	317-A
218-A	2975	685.00	1300	738	3160	107	38	48	38	10	2	6	3	2100	780.00	3950	318-A
219-A	3600	790.00	1500	903	3840	132	38	54	44	10	2	6	3	2400	910.00	4800	319-A
220-A	4275	940.00	1750	1067	4560	157	38	60	50	10	2	6	3	2800	1030.00	5700	320-A

FIG. NO. 425 AND LARGER SIZES THE ORIGINAL DEHN'S "GEM" RE-TAR-DO FLOCONTROL PLASTER, HAIR, FEATHER, FISH AND REFUSE SEPARATOR AND RETAINER

Dehn's "GEM" Separators Fig. No. 425 and larger sizes	Flow gallons water per hour	Net capacity gallons water retained	1 Diam. of top inches	3 Depth over all inches	4–6 Floor to center of waste inlet and outlet openings inches	5–7 Top to center of waste inlet and outlet openings inches	Waste inlet and outlet openings inches	Local vent opening inches	Approximate weight lbs.	Price Painted inside and outside each
425-A No. 13-1	44	3½	15	13	4	9	1½	1½	100	$45.00
426-A No. 15-1	60	5	15	15	4	11	1½	1½	120	52.00
427-A No. 18-1	80	6	15	18	4	14	2	1½	135	65.00
428-A No. 24-1	148	8½	15	24	4	20	2	1½	165	80.00
429-A No. 30-1	208	11	15	30	4	26	2	1½	195	95.00

Furnished enameled inside. Enameled inside and outside. Prices upon application.

Prices do not include any fittings.

Use Our Schedule for Capacities and You Will Succeed in Obtaining the Desired Results

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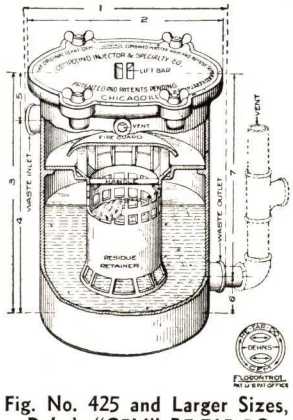


Fig. No. 425 and Larger Sizes, Dehn's "GEM" RE-TAR-DO FLOCONTROL, Plaster, Hair, Feather, Fish and Refuse Separator

THE H. W. COVERT COMPANY

229 East 37th Street, NEW YORK, N. Y.

For Covert Fireplace Specialties, see File Index

ANTI-CLOG FLOOR DRAINS

For Use in Factories, Garages, Dairies, Stable Areas, etc.

ANTI-CLOG FLOOR DRAINS

With Removable Dirt Box

Advantages of Removable Dirt Box

The dirt box set inside the drain body catches all dirt, sand and debris, which, if allowed to pass through the drain, would cause a stoppage in the drain pipe. The dirt box is equipped with a handle to facilitate removal when it is to be emptied and also has seepage holes to allow no water to remain in the box to stagnate or freeze.

Construction

Anti-clog Drains are made of heavy cast iron, with either bottom or side outlet. The body is of one piece, there being no joints to loosen and allow seepage into the floor.

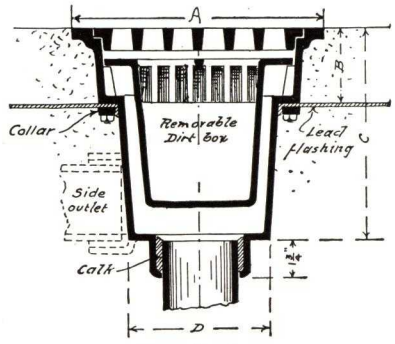
Drains installed on upper floors may be provided with lead flashings which are worked into the waterproofing section and render the floor around the drain watertight.

Bottom Outlet Anti-Clog Drains are caulked from the inside which makes it simple for the plumber to accomplish a satisfactory, watertight connection.

When it is required to have the trap within the drain, we can furnish a bell trap and replace the dirt box with a strainer plate.

DIMENSIONS

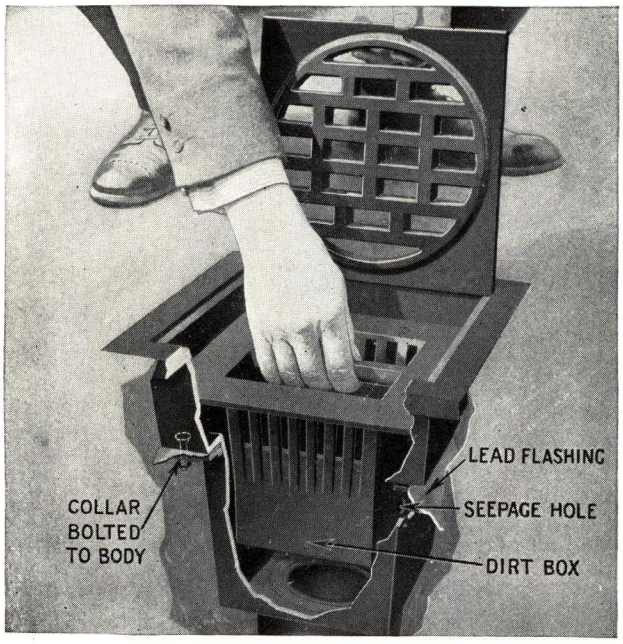
No.	A	B	C	D	Size outlet, in.
9	9	1¼	6	5	3
10	10	3½	8¼	6	3
12	12	3¾	10	6	3 or 4
15½	15½	3¾	9¼	8¾	4, 5 or 6
16	15½	3¾	13	8	4, 5 or 6
24	24	3¾	12½	15¼	4, 5 or 6



Cross Section

Specification

Furnish and install as shown on plans Covert Anti-clog Drains with removable dirt boxes [with] [without] lead flashings with [side] [bottom] outlet, made by THE H. W. COVERT COMPANY, 229 East 37th Street, New York, N. Y.

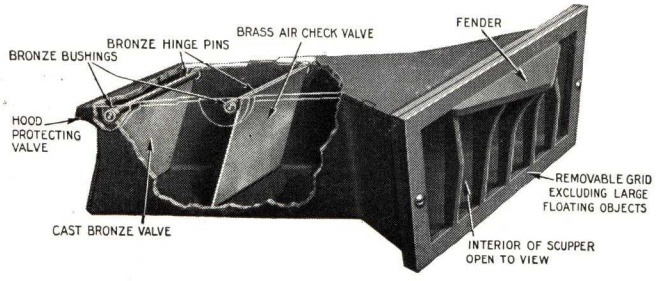


All Dirt Is Retained in the Dirt Box

Dirt Easily Removed from Dirt Box

Anti-clog Floor Drain with Removable Dirt Box

"WATERTITE" HOODED WINDPROOF SCUPPERS



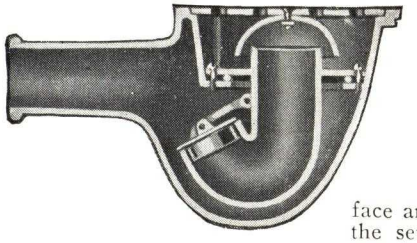
Installed in outside walls on floors of industrial buildings to carry off water in case of fire or accidental sprinkler discharge. Scuppers prevent the interruption of production, and the loss of business through damage to stocks and machinery. Insurance companies recognize the value of the protection scuppers afford and grant a reduction in insurance rates on scuppered buildings and contents. Scuppers are not expensive, are easy to install and in time pay for their own cost and earn dividends thereafter. Special folder sent on request.

ESTABLISHED 1891

CRAMPTON-FARLEY MANUFACTURING CO.

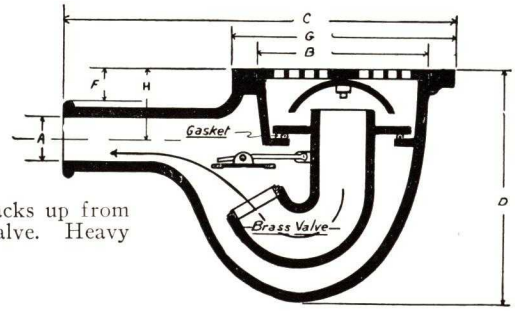
Manufacturers of Backwater Trap Floor Drains for Over 30 Years

221 Main Street, KANSAS CITY, MO.



SAN-SEAL-O FLOOR DRAINS

The San-Seal-O drain was the first successful "flapper type" drain to be really adopted by many architects and the plumbing trade. The brass valve is submerged and for this reason it works easily and insures positive action as grease, lint and other matter rise to surface and are carried off. When the water backs up from the sewer, the pressure is on top of the valve. Heavy cast iron body.

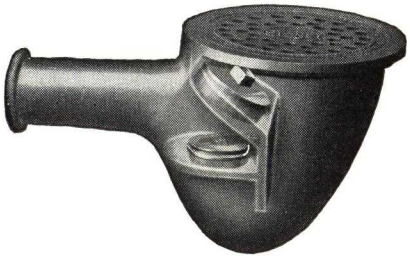


DIMENSIONS, SAN-SEAL-O FLOOR DRAINS

No.	Wt., lb.	Style outlet	A in.	B in.	C in.	D in.	F in.	G in.	H in.
0	22	I. P.	1½	6⅝	11¾	8½	1½	7¾	2½
00	24	I. P.	2	6⅝	11⅞	8½	1	7¾	2½
1	24	S. P.	2	6⅝	13½	8½	1¼	7¾	2⅝
2	35	S. P.	2	9⅜	18¾	8½	1¼	10⅞	2½
3	60	S. P.	3	11⅜	21½	12	2	13	4
4	85	S. P.	4	13	24	14½	1⅛	14½	3½

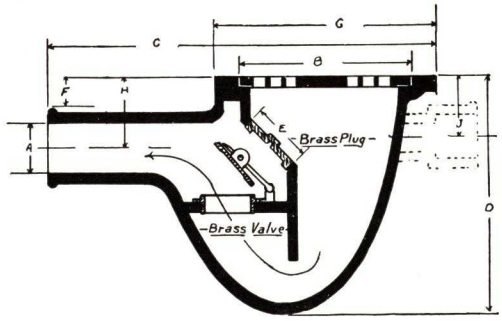
Regularly furnished with iron strainers.

Nickel, chromium plated or polished brass tops furnished when desired.



SIGNET FLOOR DRAINS

The bowl-like construction of this drain makes it very accessible for removing sediment. The brass valve is submerged. It is placed in a horizontal position to avoid concentrated wear on any one segment of the seat. The slight water pressure required to raise the cap, keeps the thin seat rim clean. Heavy cast iron body.



DIMENSIONS, SIGNET FLOOR DRAINS

No.	Wt., lb.	Style outlet	Back inlet, in.	A in.	B in.	C in.	D in.	E in. plug	F in.	G in.	H in.	J in.
2	20	S. P.	.....	2	6⅝	13⅜	7¾	2½	1 5/16	7¾	2 11/16	.....
3	50	S. P.	.....	3	11⅜	21½	12	3¼	2	13	4	.....
4	65	S. P.	.....	4	13	24¼	14	4	2	14¾	4⅜	.....
D-2	19	I. P.	.....	2	6⅝	11⅞	7¾	2½	1	7¾	2½	.....
D-2-R	22	I. P.	1½ I.P.	2	6⅝	11⅞	7¾	2½	1	7¾	2½	.....
2-R	22	S. P.	1½ I.P.	2	6⅝	13⅜	7¾	2½	1 5/16	7¾	2 11/16	1¾
3-H	55	S. P.	2 S.P.	3	11⅜	21½	12	3¼	2	13	4	2¾
4-H	70	S. P.	2 S.P.	4	13	24¼	14	4	2	14¾	4⅜	2¾

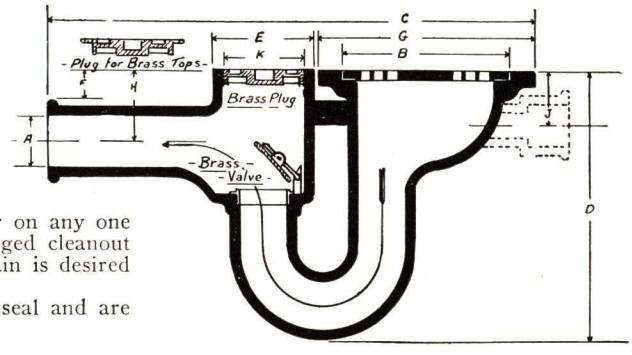
Regularly furnished with iron strainers.

Nickel, chromium plated or polished brass tops furnished when desired.

GATEWAY FLOOR DRAINS

The brass valve is submerged and is placed in a horizontal position to avoid concentrated wear on any one segment of the seat. Flanged cleanout plug is furnished when drain is desired with brass top.

All sizes have full 4-in. seal and are made of heavy cast iron.



DIMENSIONS, GATEWAY FLOOR DRAINS

No.	Wt., lb.	Style outlet	Back inlet, in.	A in.	B in.	C in.	D in.	E in.	F in.	G in.	H in.	J in.	K in. plug
2	22	S. P.	.....	2	6⅝	19	10 3/16	4½	1½	7⅛	2⅛	.....	3¼
3	55	S. P.	.....	3	9⅜	24⅝	13	5½	2 1/16	10⅝	3 15/16	.....	3¼
4	65	S. P.	.....	4	11½	28	14½	6⅜	2	13	4 5/16	.....	4
D-2	22	I. P.	.....	2	6⅝	15⅝	10 3/16	4½	1⅜	7⅞	2⅞	.....	3¼
2-R	24	S. P.	1½ I.P.	2	6⅝	19	10 3/16	4½	1½	7⅞	2⅞	1 1/16	3¼
2-H	24	S. P.	2 S.P.	2	6⅝	19	10 3/16	4½	1½	7⅞	2⅞	2½	3¼
3-H	60	S. P.	2 S.P.	3	9⅜	24⅝	13	5½	2 1/16	10⅝	3 15/16	2⅞	3¼
4-H	70	S. P.	2 S.P.	4	11½	28	14½	6⅜	2	13	4 5/16	2⅞	4

Regularly furnished with iron strainers.

Nickel, chromium plated or polished brass tops furnished when desired.

WRITE FOR OUR COMPLETE CATALOGUE

FLEMING DRAIN DIVISION OF PORTLAND IRON WORKS

Manufacturers of "Fleming" Sanitary Drains

(Reg. U. S. Pat. Off.)

PORTLAND, ORE.

Exclusive Licensees for United States (U. S. and Foreign Patents)
SOLD THROUGH LEADING JOBBERS IN PRINCIPAL CITIES
COMPLETE WAREHOUSE STOCK IN PHILADELPHIA
SALES REPRESENTATION
PHILADELPHIA, PA., 729 Arch Street NEW YORK, N. Y., 101 Park Avenue

ROOF AND GUTTER DRAINS

FLEMING
Reg. U. S. Pat. Off.

General Specification

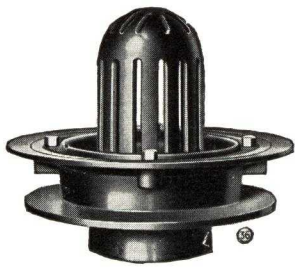
Heavy body of close grained iron for long life in all weather and in any climate. Quadruple bolted flashing clamping device with tight and even grip on flashing sheet. Reliably leakproof joint. Finish: black or galvanized. Fittings of cast brass or bronze upon special order, complete or in part.

Deck Drain (Series A-TD 500)

For tiled deck or promenade roofs. Flashing clamping section serves as tile curb. Square top of iron or brass as specified, with loose or hinged grate. Sizes 2 to 8-in.

Slab Roof Drain (Series A)

For slab roofs of concrete or other aggregates, or for wood roofs with tar and gravel top. With concrete locking-in flange. Dome may be unbolted and removed if necessary. Sizes 2 to 8-in. Caulk or screw outlet optional.

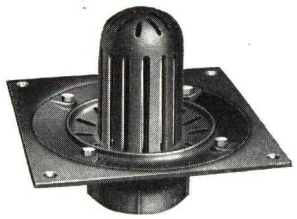


Deck Drain (Series A-TD 600)

Same as A-TD 500 above except round top. Preferably for use with plastic floors, of cement, terrazzo, etc. Loose or hinged grate. Sizes 2 to 8-in. Caulk or screw outlet optional.

Slab Roof Drain (Series A-SO)

Same as above Series A, Slab Type, except horizontal outlet. Tapped for iron pipe. Series limited to 2, 3 and 4-in. sizes.



Wood Roof Drain (Series A)

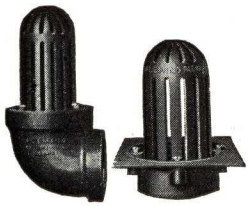
Wood-Roof Drain with large square flange provided with screw holes for fastening drain to wood roof. Sizes 2 to 8-in. Caulk or screw outlet optional.

Wood Roof Drain (Series W-ARD)

Intended especially for installation in wood roofs. Round or square flange. No concrete locking-in flange. Sizes 3, 4 and 5-in. Caulk or screw outlet optional.

Roof and Deck Drain (Series A-TD 700)

For roofs of concrete and similar materials. Flashing ring serves as a gravel or tile stop. Dome is screw-fastened, but removable. Sizes 2 to 8-in. Caulk or screw outlet optional.



Gutter Drains (Series VG-200 and VG-100)

Gutter drains for narrow gutters, troughs and valleys. A miniature of the Series A roof drain shown above and with like design features, but compact in construction to fit in close quarters. Round or square flange. Sizes 2 to 5-in. Threaded outlet.

Special Gutter Drain (Series VG-500)

Compact in form. Has tile stop ring which also serves for clamping the flashing sheet. Dome is screw fastened and *removable*. 2, 3 and 4-in. sizes. Threaded outlet.

Complete Catalog with detail information sent on request.

FLOOR DRAINS WITH ADJUSTABLE STRAINERS

General Specification

All fittings have substantial cast iron body and are of fine workmanship. Quadruple bolted flashing clamping joint guarantees *leakproof* installation. Strainer heads have *long range adjustment* and come fitted with patented fiber cup fillers as a temporary closure against fouling during construction. Approved under Federal Specification WW-P-541. Finish: black or galvanized. Cast brass strainer with polished or plated top. All-brass fittings to order.

Toilet and Shower Drain (Series B)

For floors with tile, terrazzo, mosaic or cement finish, with or without flashing flange. Bottom or side outlet, usually threaded. Sizes: bottom outlet 2 to 5 in.; side outlet 2 to 4 in.; strainer diameters to suit specifications.

Toilet and Shower Drain (Series D)

Toilet and Shower Drain with integral trap. "Standard" with 2¾-in. seal in sizes 1½ to 4 in. "Shallow" with 2-in. seal in sizes to 3 in. Backwater valve fitted if required.

PLAIN FLOOR DRAINS WITH NON-ADJUSTABLE STRAINERS

General Specification

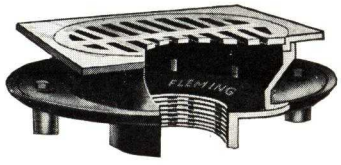
Drains are of *massive* construction for heavy duty service. Extra strong grates, safe against tilting under eccentric loads. Available with or without clamping device for sheet flashing.

Finish: black or galvanized. For ornate purposes, most fittings can be supplied with brass trim, polished or plated.

Extra Heavy Deck and Area Drain (Series C-FAD)

Round Top

For waterproofed construction in industrial and commercial buildings of every kind. Provided with subdrainage passages and inside secondary strainer for arresting heavy debris. Side or bottom outlet. Sizes 2 to 12 in.



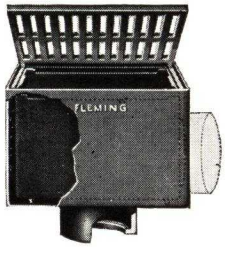
Extra Heavy Deck and Area Drain (Series C-FAD)

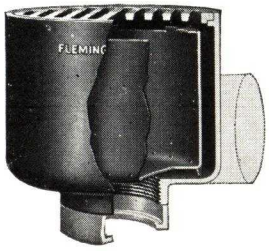
Square Top

Modified form of above with square top for brick or tile floors. Brass trim for ornate purposes. Bottom or side outlet. Sizes 2 to 12 in.

Garage, Power Plant and Coal Vault Drain (Series F-400)

With sediment bucket and 9x12-in. hinged non-slip grate. For service where drain waters carry much solid matter. Normally furnished with bottom outlet. Side caulk outlet to order. Sizes 2, 3 and 4 in.





Bowl Type Area Drain (Series C-100)

With interceptor bucket. Plain body *less* flashing clamping feature. Adapted for all floors laid on earth. Heavy non-tilting grate, loose. Bottom and side outlet. Sizes 2 to 6 in.

Cesspool (Series C-200)

Round Top

Cesspool of substantial design with one-piece body and seepage pan. Furnished with flashing rings when wanted. For ordinary service in private or public buildings. Loose or hinged grate. Bottom outlet in sizes 2 to 6 in. Side outlet for caulking to 4 in. only.

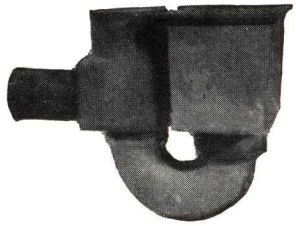
Cesspool (Series C-400)

Square Top

Similar to Series C-200 above, except square top for tile or brick floors. Brass trim for ornate service. Sizes same as noted above.

Deep Bowl Area Drain (Series C-SP)

With removable slush bucket and flashing joint for leakproof installation. Durable and fit for heavy duty service. Threaded bottom outlet and caulking side outlet in sizes from 2 to 6 in.

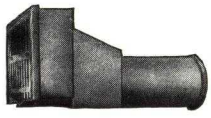


Industrial Drain (Series F-200)

With integral deep seal trap, sediment bucket and clean-out. Adapted for industrial plants where water contains large percentage of solid matter. Non-slip grate, 9x12 in. loose or hinged. Spigot outlet for 2, 3 and 4-in. soil pipe.

Corner Outlet Drain (Series A-PO)

For porches, terraces, pools, etc. Has flashing clamping feature and may be installed for either vertical or horizontal discharge to sewer lines. Threaded outlet for 3, 4, 5 and 6-in. pipe.



Sidewall Outlet Drain (Series PT)

For porches, terraces, balconies, pits, manhole vaults and similar locations. Made with 2, 3 or 4-in. spigot outlet.

Complete Catalog with detail information mailed upon request

MEMORANDA

Josam PRODUCTS

STANDARD OF AMERICA

JOSAM REPRESENTATIVES IN U. S. AND CANADA — PAGE 2

JOSAM ADJUSTABLE SUPPORT FOR WALL CLOSETS AND URINALS — PAGE 27

JOSAM ADJUSTABLE CLOSET OUTLET CONNECTIONS AND BENDS — PAGE 26

JOSAM SHOCK ABSORBERS FOR QUIETING WATER HAMMER — PAGE 25

JOSAM INTERCEPTORS FOR DENTAL AND SURGICAL SINKS, HAIR, LINT, PLASTER — PAGE 24

JOSAM INTERCEPTORS FOR GREASE - NOT WATER-COOLED — PAGES 22,23,25

JOSAM INTERCEPTORS FOR OIL, GASOLINE AND NAPTHA — PAGE 21

JOSAM ROOF DRAINS, EXPANSION JOINTS, AND VENT STACK SLEEVES — PAGES 17,18,19

JOSAM SWIMMING POOL EQUIPMENT - INLETS, OUTLETS, GUTTERS, OVERFLOWS, EJECTORS — PAGES 14,15,16

JOSAM BACKWATER SEWER VALVES A POSITIVE PROTECTION AGAINST BACKWATER — PAGE 13

JOSAM GARAGE AND INDUSTRIAL TYPE FLOOR DRAINS WITH AND WITHOUT SEDIMENT CONTAINERS — PAGES 4,5,6,9,10, 11,12,20,21

JOSAM DOUBLE DRAINAGE FLOOR, SHOWER AND URINAL DRAINS — PAGES 7,8,9,10,11,12

JOSAM NON-CLOG TRIPLE DRAINAGE SEDIMENT ARRESTING FLOOR DRAINS — PAGES 3,4,5,6

JOSAM ENGINEERING SERVICE - DETAIL SHEETS STANDARD SPECIFICATION BROCHURES — PAGE 2

JOSAM MANUFACTURING CO.

MAIN SALES AND ENGINEERING OFFICE
EMPIRE BUILDING — CLEVELAND, OHIO
FACTORY AND FOUNDRY
MICHIGAN CITY, INDIANA
Branches in all Principal Cities

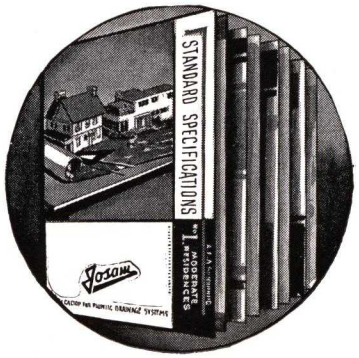
THERE ARE NO SUBSTITUTES FOR JOSAM PRODUCTS

Josam TRADE MARK REG. ENGINEERING SERVICE

Years of practical experience . . . in designing and installing plumbing systems are available to you through the services of the Josam Engineering Staff. Hundreds of unusual drainage requirements have been satisfactorily met. Often, it has been necessary to design a special type of drain to fully meet the requirements and to provide the utmost protection for buildings and contents. Josam makes available to you exhaustive information concerning the installations of the proper types of drainage facilities to meet troublesome situations.

To avail yourself of Josam Engineering Service, get in touch with the nearest Josam Representative listed on page 28, or write direct to Josam Engineering Department at Cleveland, Ohio. Give full details and whenever possible, send blueprints or sketches indicating conditions and type of building construction.

Here's Something!.. All Architectural Offices Should have these on File

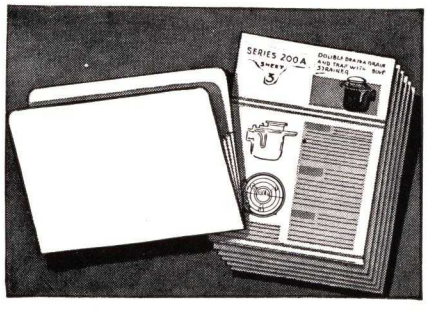


JOSAM STANDARD SPECIFICATIONS FOR PLUMBING DRAINAGE SYSTEMS

Josam again initiates a service to architects with this series of "Standard Specification Brochures," for reference and guidance, giving plumbing drainage specifications for 119 types of buildings. These reference books are something specification men will readily appreciate . . . an authoritative means of checking plumbing drainage specifications . . . books they'll find a distinct asset in their work . . . because all relative and needed specification data is presented between two covers. For the first time complete authoritative information on plumbing drainage system specifications is now available.

Ask for* STANDARD SPECIFICATIONS *for type of building on which you are now engaged

Moderate Residences
Residential Buildings (Apartments and Hotels)
Governmental and Administrative Buildings
Educational and Scientific Buildings
Industrial and Manufacturing Buildings
Hospital and Remedial Buildings
Commercial and Mercantile Buildings
Social and Recreational Buildings
Transportation and Storage Buildings
Religious and Funerary Buildings
Exhibition and Exposition Buildings
Bathing and Swimming Pools
Highway and Non-sheltered Structures



JOSAM DETAIL SHEETS

Detail Sheets giving practical installation and engineering information for various Josam Products, are available to architects and engineers, upon request. These Detail Sheets show all up-to-the-minute improvements in Josam Products. Whenever additional detail sheets are prepared, they will be forwarded to architects and engineers who file a request for them, to the Josam Engineering Department, Cleveland, Ohio.

AN EXCELLENT WAY TO DETERMINE AND APPRECIATE THE REFERENCE AND GUIDANCE VALUE OF JOSAM STANDARD SPECIFICATIONS AND JOSAM DETAIL SHEETS, IS TO APPLY THESE SERVICES TO YOUR PRESENT PROJECTS. SEND IN YOUR REQUEST TODAY, TO

JOSAM MANUFACTURING COMPANY

ENGINEERING DEPARTMENT, EMPIRE BUILDING, CLEVELAND, OHIO

JOSAM NON-CLOG TRIPLE DRAINAGE SEDIMENT ARRESTING FLOOR DRAINS

Maintain Flow from Floor Surface at All Times

The Non-clog Sediment Container Prevents either Sediment or Floating Solids from Entering Drain Body or Channels of Auxiliary Flow

Josam Non-clog Drains are a definite improvement in Sediment Arresting types, to the extent that surface flow is maintained at all times, and all solids, particularly floating material, are intercepted.

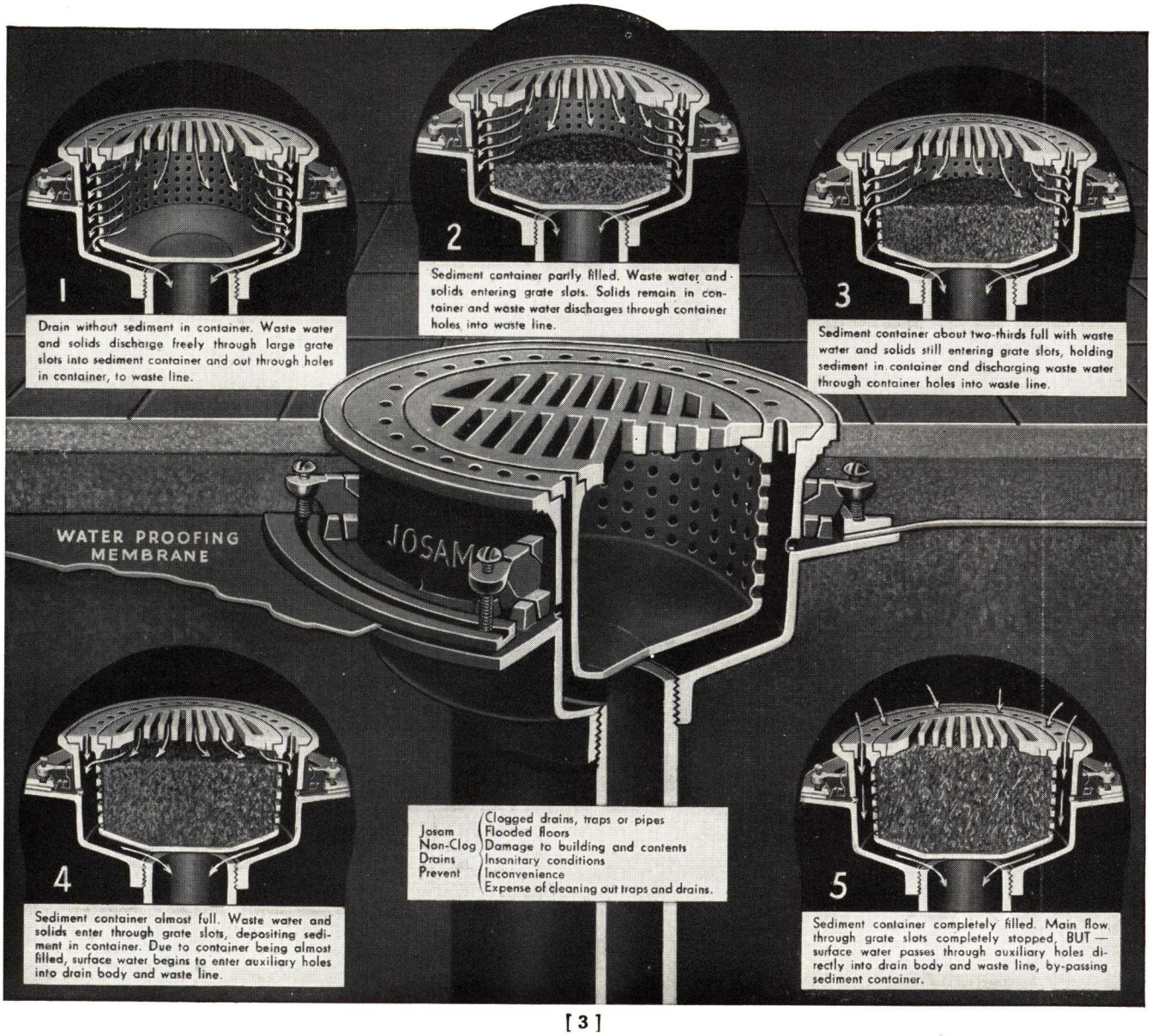
Flooded floors resulting from clogged drains, traps or pipes, often create decidedly unsanitary conditions, as well as damage to buildings and contents, besides the inconvenience and expense of cleaning out traps and drains. Josam Non-clog Drains prevent such occurrences.

Assembly is foolproof as it is compulsory to install the container which supports grate, before grate can be installed.

GENERAL APPLICATIONS

Industrial Plants	Warehouses	Areaways	Toilet and Wash Rooms
Boiler and Coal Rooms	Basement Storage Rooms	Yards and Driveways	Large Kitchens
Ash Pits	Basement Equipment Rooms	Garage Floors	Swimming Pool Outlets
		Residence Basements	

Collecting and salvaging materials discharged with waste water in packing plants.
Intercepting floating material, such as bottle caps in dairies.



Josam PRODUCTS

GENERAL APPLICATIONS

•

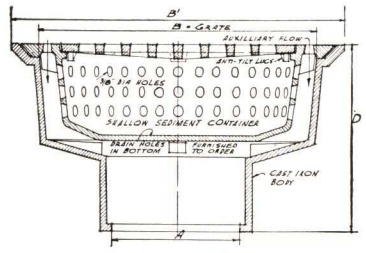
Areaways
Basements
Storage Rooms
Basement Equipment Rooms
Toilet and Wash Rooms
Boiler Rooms
Coal Rooms
Yards
Driveways
Ash Pits
Large Kitchens

in

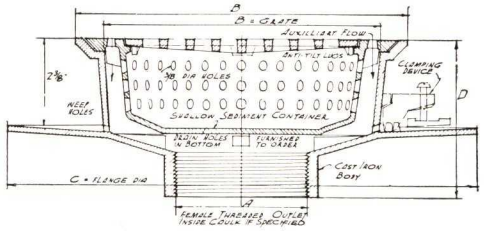
Residences
Warehouses
Industrial Plants
Public Buildings
Hotels
Institutions
Breweries
Clubs

See the Following Pages for Other Types of Non-Clog Triple Drainage Drains

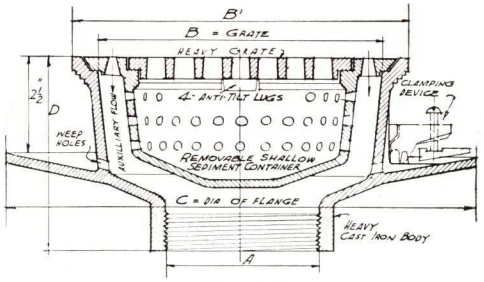
JOSAM NON-CLOG TRIPLE DRAINAGE FLOOR DRAINS



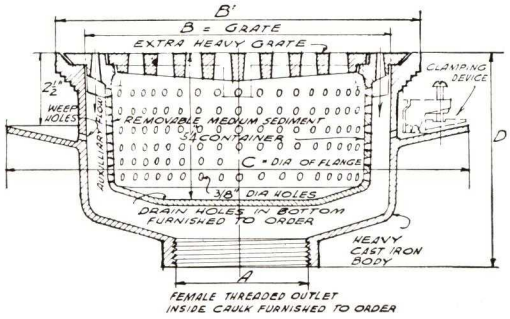
Series 5400X



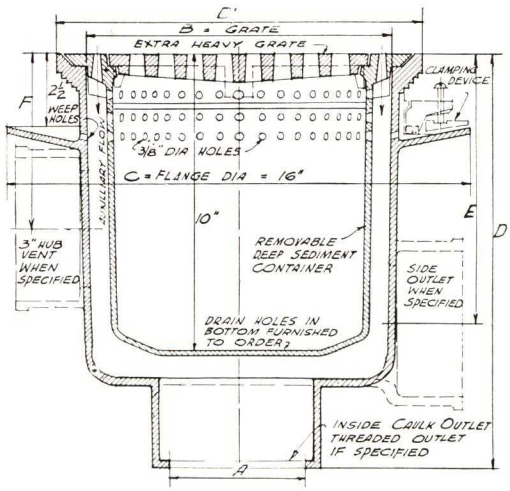
Series 5410



Series 5420



Series 5440



Series 5600X

SERIES 5400X

Light Service type, cast iron japanned, without double drainage flange, with non-clog sediment container, inside caulk or female threaded bottom outlet.

SERIES 5410

Light service triple drainage type, cast iron japanned with non-clog shallow sediment container, female threaded or inside caulk bottom outlet.

SERIES 5420

Medium service, triple drainage type, cast iron japanned, with non-clog shallow sediment container, female threaded or inside caulk bottom outlet.

SERIES 5440

Heavy duty triple drainage type, cast iron japanned, with non-clog medium sediment container, female threaded or inside caulk bottom outlet.

SERIES 5600X

Extra heavy triple drainage type, cast iron japanned, with non-clog deep sediment container, inside caulk or female threaded bottom outlet, 3-in. hub local vent when so ordered.

OPTIONAL

Galvanized Iron—Brass Top—All Brass—Clamping Device—Combined Trap—Backwater Valve—Square Top—Hinged Grate—Primer Tapping—Side Outlet—Bottom drain holes in sediment container.

Type	Dimensions in inches							Weight, lbs.
	A Outlet	B Grate	B'	C	D	E	F	
SERIES 5400X								
5402X	2	7 3/8	9	.....	5	.....	.....	14
5403X	3	7 3/8	9	.....	5	.....	.....	14
5404X	4	7 3/8	9	.....	5	.....	.....	14
SERIES 5410								
5412	2	7 3/8	9	12 1/2	4 1/2	.....	.....	20
5413	3	7 3/8	9	12 1/2	4 1/2	.....	.....	20
5414	4	7 3/8	9	12 1/2	4 1/2	.....	.....	20
5422	2	7 1/2	9	12 1/2	5	.....	.....	22
5423	3	7 1/2	9	12 1/2	5	.....	.....	22
5424	4	7 1/2	9	12 1/2	5	.....	.....	22
SERIES 5440								
5443	3	10 3/4	12 1/2	16	7 1/8	.....	.....	58
5444	4	10 3/4	12 1/2	16	7 1/8	.....	.....	58
5445	5	10 3/4	12 1/2	16	7 1/8	.....	.....	58
5446	6	10 3/4	12 1/2	16	7 1/8	.....	.....	58
SERIES 5600X								
5603X	3	10 3/4	12 1/2	16	13 1/2	9 1/2	6	86
5604X	4	10 3/4	12 1/2	16	13 1/2	9	6	86
5605X	5	10 3/4	12 1/2	16	13 1/2	8 1/2	6	86
5606X	6	10 3/4	12 1/2	16	13 1/2	8	6	86

JOSAM NON-CLOG TRIPLE DRAINAGE FLOOR DRAINS

SERIES 5700X

Heavy duty, triple drainage type, cast iron japanned, with non-clog medium sediment container, inside caulk or female threaded bottom outlet, 14 in. or 18 in. grate.

SERIES 5730X

Extra heavy duty triple drainage type, cast iron japanned, with non-clog deep sediment container, inside caulk or female threaded bottom outlet, 14 in. or 18 in. grate.

OPTIONAL

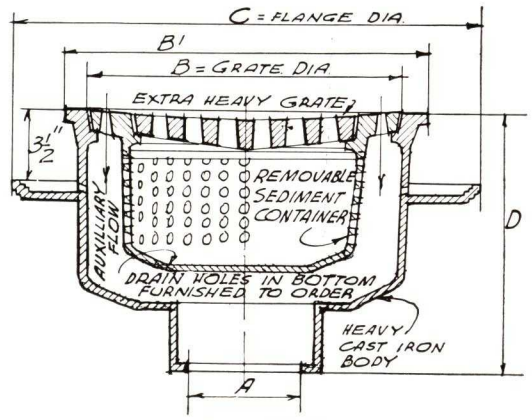
Galvanized iron—brass top—clamping device—combined trap — backwater valve — square top — female threaded, hub or spigot side outlet—hinged grate—primer tapping—bottom drain holes in sediment container—3 in. hub local vent on Series 5730X.

SERIES 5760

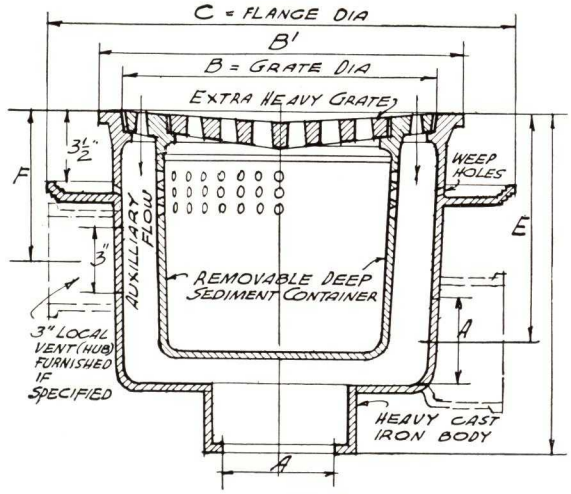
Extra heavy duty triple drainage type, combined drain and trap with 6 in. threaded brass top cleanout, cast iron japanned, with non-clog deep sediment container, hub outlet, 14 in. or 18 in. grate.

OPTIONAL

Galvanized iron—brass top—clamping device—flap type backwater valve—hinged grate—primer tapping—bottom drain holes in sediment container—3-in. hub local vent.



Series 5700X



Series 5730X

Type	Dimensions in inches							Weight, lbs.
	A outlet	B grate	B′	C	D*	E*	F*	
SERIES 5700X								
5703X	3	14	16	22	12	.....	.....	164
5704X	4	14	16	22	12	.....	.....	164
5705X	5	14	16	22	12	.....	.....	164
5706X	6	14	16	22	12	.....	.....	164
5713X	3	18	21	27	15	.....	.....	270
5714X	4	18	21	27	15	.....	.....	270
5715X	5	18	21	27	15	.....	.....	270
5716X	6	18	21	27	15	.....	.....	270
5718X	8	18	21	27	15	.....	.....	270

SERIES 5730X

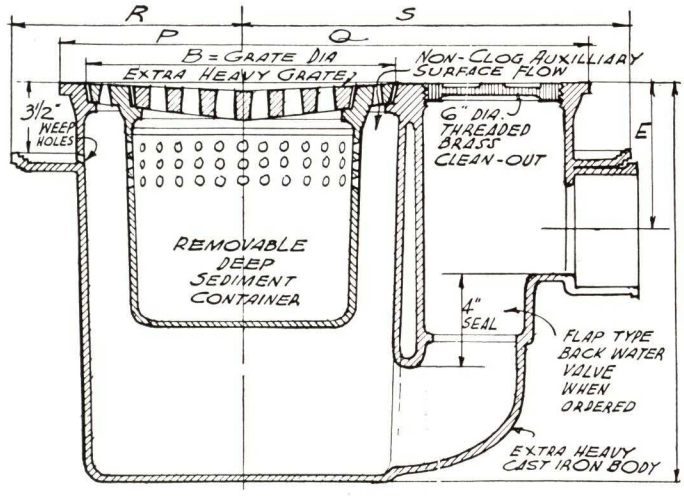
Type	Dimensions in inches							Wght. lbs.
	A outlet	B grate	B′	C	D*	E*	F*	
5733X	3	14	16	22	15	10½	6½	200
5734X	4	14	16	22	15	10	6½	200
5735X	5	14	16	22	15	9½	6½	200
5736X	6	14	16	22	15	9	6½	200
5743X	3	18	21	27	18	16	6½	320
5744X	4	18	21	27	18	15½	6½	320
5745X	5	18	21	27	18	15	6½	320
5746X	6	18	21	27	18	14½	6½	320

*Decrease 1¼ in. when furnished with female threaded outlet.

SERIES 5760

Type	A outlet	B grate	D*	E*	P	Q	R	S	Wght., lbs.
5762	2	14	18	7¾	7¾	15¼	11	17½	230
5763	3	14	18	7¼	7¾	15¼	11	17½	230
5764	4	14	18	6¾	7¾	15¼	11	17½	230
5772	2	18	18	7¾	10½	17½	13½	20	360
5773	3	18	18	7¼	10½	17½	13½	20	360
5774	4	18	18	6¾	10½	17½	13½	20	360

*Add ½ in. when furnished with brass top.



Series 5760

GENERAL APPLICATIONS

Yards
Roadways
Washracks
Driveways
Boiler Rooms
Ash Pits

In

Garages
Industrial Plants
Laundries
Packing Plants
Warehouses
Public Buildings
Breweries
Hotels

See the Following Pages for Other Types of Non-Clog Triple Drainage Drains

Josam PRODUCTS

GENERAL APPLICATIONS

•

SERIES 1400C AND SERIES 1700C

Built-up Shower Stalls

Janitor's Closets

Gutters

Shower Cabinets

SERIES 2800A AND SERIES 3000

Urinal Stalls

Shower Receptors

in

Schools

Hospitals

Public Buildings

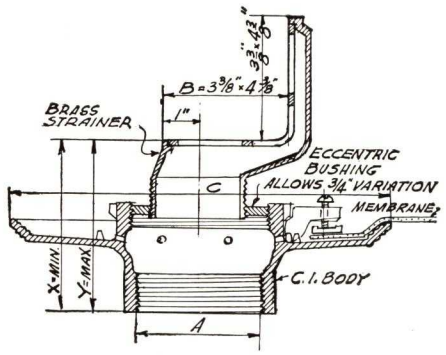
Hotels

Prisons

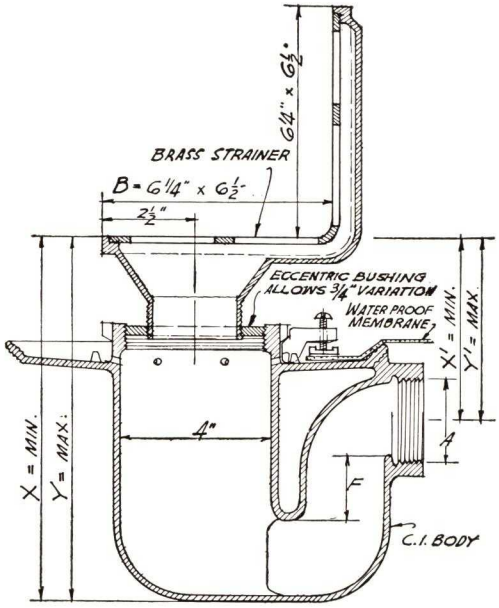
Institutions

See the following pages for other types of floor drains

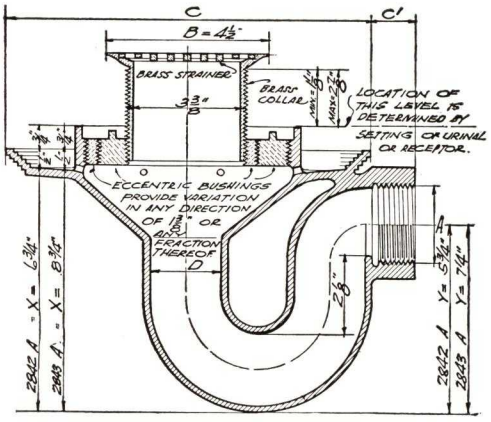
JOSAM DOUBLE DRAINAGE FLOOR, SHOWER AND URINAL DRAINS



Series 1400C



Series 1700C



Series 2800A

SERIES 1400C

Drain without trap. Threaded adjustable brass angle strainer provides means for meeting variation in level or thickness of floors. Eccentric bushing provides lateral adjustment in locating strainer to predetermined line. Furnished with or without clamping device.

Cast iron japanned body, adjustable N.P. brass angle strainer, brass eccentric bushing, female threaded outlet, unless otherwise specified. Outlet also furnished for inside caulking or with adaptor for spigot connection when so specified.

SERIES 1700C

Combined drain and trap. Threaded adjustable brass angle strainer provides means for meeting variation in level or thickness of floors. Eccentric bushing provides lateral adjustment in locating strainer to predetermined line. Furnished with or without clamping device.

Cast iron japanned body, adjustable N.P. brass angle strainer, brass eccentric bushing, female threaded outlet, unless otherwise specified. Outlet also furnished with adaptor for hub or spigot connection when so specified.

Type	Dimensions in inches								Weight, lbs.
	A Outlet	B Strainer Size	B Strainer Type	C	F	X	Y	X¹	Y¹	
SERIES 1400C										
1401½	1½	3⅜x4⅜	42K	9¼	.....	3¾	4½	.....	.....	9
1402	2	3⅜x4⅜	42K	9¼	.....	3¾	4½	.....	.....	9
1403	3	3⅜x4⅜	42K	9¼	.....	3¾	4½	.....	.....	12
1404	4	3⅜x4⅜	42K	10¼	.....	3¾	4½	.....	.....	12
1411½	1½	6¼x6½	43K	9¼	.....	3¾	5½	.....	.....	12
1412	2	6¼x6½	43K	9¼	.....	3¾	5½	.....	.....	12
1413	3	6¼x6½	43K	9¼	.....	3¾	5½	.....	.....	12
1414	4	6¼x6½	43K	10¼	.....	3¾	5½	.....	.....	14
SERIES 1700C										
1701½	1½	3⅜x4⅜	42K	12	2⅛	8⅝	9½	3⅝	4½	21
1702	2	3⅜x4⅜	42K	11½	2⅜	8⅝	9½	3	4¾	21
1703	3	3⅜x4⅜	42K	12½	2¼	9⅝	10½	3⅛	4¾	24½
1704	4	3⅜x4⅜	42K	15½	2¼	11½	12⅜	4½	5⅜	36
1711½	1½	6½x6¼	43K	12	2⅛	9⅛	10½	4⅛	5½	22
1712	2	6½x6¼	43K	11½	2¾	9⅞	11¼	4¼	5⅝	22
1713	3	6½x6¼	43K	12½	2¼	10⅝	12	4½	5⅞	26
1714	4	6½x6¼	43K	15½	2⅛	12½	13⅞	5⅜	6¾	37

SERIES 2800A

Especially adaptable when installation calls for two or more stalls. The double eccentric feature assures positive connection at receptor openings regardless of variations in roughing in. Threaded adjustable brass strainer provides means for meeting variation in level or thickness of floors. Strainers can be furnished to fit all standard makes of receptors.

Cast iron japanned body with double eccentric brass bushings, nickel plated adjustable brass strainer, recessed female threaded outlet, unless otherwise specified. Outlet also furnished with adaptors for hub or spigot connection when so specified. Also furnished with beehive or dome strainers.

Type	Dimensions in inches							Weight, lbs.
	A	B	C	C'	D	X	Y	
2842A	2	4½	10¾	1¼	2	6¾	5¾	20
2843A	3	4½	10¾	1⅞	3	8¾	7¼	30

Series 3000—Identical in construction with Series 2800A except without trap. Has female threaded bottom outlet but can be furnished for inside caulking or with adaptor for spigot connection.

JOSAM DOUBLE DRAINAGE FLOOR DRAINS OR CESSPOOLS

SERIES 510

Especially recommended where shallow floors call for a drain with a low overall height.

Cast iron japanned body, anti-tilting grate, female threaded outlet, unless otherwise specified.

SERIES 530A

Extra heavy type for floors requiring large drainage facilities and especially desirable where floor is subjected to heavy trucking. Supplementary strainer prevents clogging of waste line. Cast iron body, extra heavy anti-tilting grate and perforated supplementary strainer, female threaded outlet unless otherwise specified.

SERIES 550R

For use in shallow floors where construction requires a shallow side outlet drain.

Cast iron japanned body, anti-tilting grate, hub outlet, unless otherwise specified.

SERIES 570JM

For use where a mastic flooring is used over old wood floors and construction requires a waterproofing membrane.

Cast iron japanned body, anti-tilting grate, female threaded outlet, flashing clamping device, unless otherwise specified.

SERIES 580S

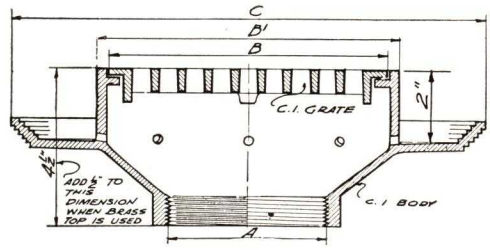
For use where a drain with square top is desired.

Cast iron japanned body, square frame and square grate, female threaded outlet, unless otherwise specified.

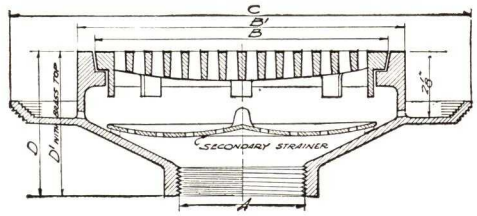
OPTIONAL

Galvanized iron or all brass body—brass, white metal or chrome plated top—threaded, inside caulk or spigot bottom outlet; threaded, hub or spigot side outlet, flashing clamping device—spun copper ball back water valve in bottom outlet drains.

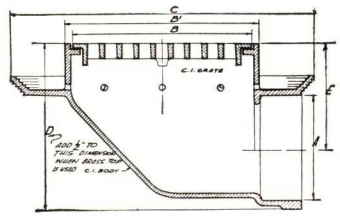
Type	Dimensions in inches							Weight, lbs.
	A	B	B′	C	D	D′	E	
SERIES 510								
512	2	8	8¾	13½	.....	.....	.....	18
513	3	8	8¾	13½	.....	.....	.....	18
514	4	8	8¾	13½	.....	.....	.....	18
524	4	11	12⅜	17	.....	.....	.....	40
525	5	11	12⅜	17	.....	.....	.....	40
526	6	11	12⅜	17	.....	.....	.....	40
SERIES 530A								
532A	2	10	11	15	5	5½	.....	40
533A	3	10	11	15	5	5½	.....	40
534A	4	10	11	15	5	5½	.....	40
544A	4	14	15¼	19¼	5	5⅝	.....	68
545A	5	14	15¼	19¼	5	5⅝	.....	70
546A	6	14	15¼	19¼	5	5⅝	.....	70
548A	8	14	15¼	19¼	5¼	5⅞	.....	75
SERIES 550R								
552R	2	8	8¾	13½	7	.....	4¾	30
553R	3	8	8¾	13½	7	.....	4¼	30
554R	4	8	8¾	13½	8	.....	4¾	33
555R	5	11	12⅜	17	9¾	.....	6½	55
556R	6	11	12⅜	17	9¾	.....	6	55



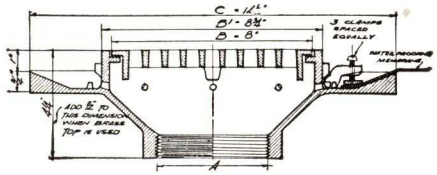
Series 510



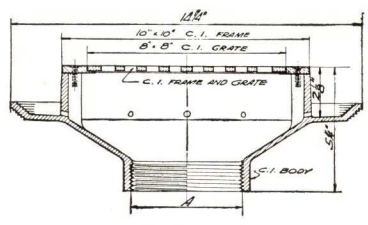
Series 530A



Series 550R



Series 570JM



Series 580S

See the following pages for other types of floor drains

GENERAL APPLICATIONS

•

SERIES
560AG
660
760B
5320X

Boiler Rooms
Coal Rooms
Ash Pits
Areaways
Basements
Driveways
Scale Pits
Elevator Pits
Large Kitchens
Cold Storage Rooms
Bottling Rooms
Courts

SERIES
1500
1600

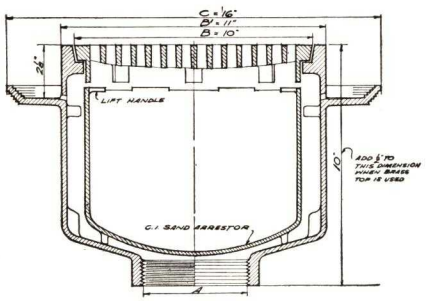
Gutters
Parapet Balconies
Terraces

in

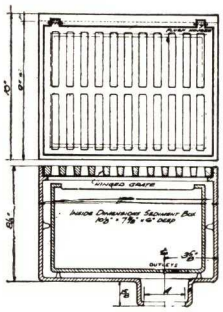
Schools
Dairies
Laundries
Warehouses
Packing Houses
Public Buildings
Prisons
Institutions
Garages
Industrial Plants

See the following pages for other types of floor Drains

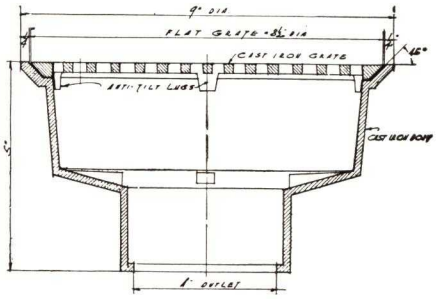
JOSAM FLOOR, AREAWAY AND GUTTER DRAINS



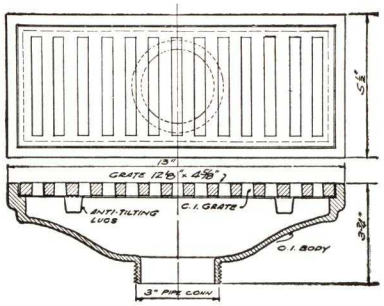
Series 560AG



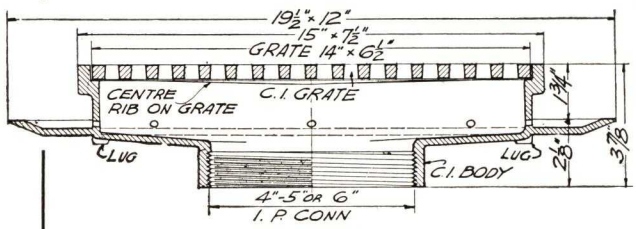
Series 760B



Series 5320X



Series 1500



Series 1600

SERIES 560AG

For use where a heavy duty drain with an easily removable sediment bucket is required.

Sediment bucket has substantial grips which enable it to be easily lifted out for cleaning. This drain is of sufficient strength to withstand heavy trucking.

Heavy cast iron japanned body, anti-tilting grate, sediment bucket, female threaded outlet, unless otherwise specified.

Series 660—Identical in design with Series 560AG except that Series 660 is larger and of heavier construction.

SERIES 760B

A bucket type drain to prevent foreign matter in floor drainage from entering waste lines, and where construction does not require a trapped drain.

Sediment bucket has rounded corners which eliminate fouling, and is equipped with hand grips permitting easy removal for emptying.

Hinged grate is of sufficient strength to withstand heavy trucking.

Heavy cast iron japanned body, heavy flush hinged grate, sediment bucket, bottom outlet for inside caulking, unless otherwise specified.

SERIES 5320X

For use where a moderately priced drain is desired in areaways, basements and sub-basements.

Cast iron japanned body, removable combined dome strainer and sediment cup, outlet for inside caulking, unless otherwise specified.

Series 5300—Same as 5320X except with convex grate.

Series 5200X—Same as 5320X except with dome strainer and sediment cup.

SERIES 1500

Heavy cast iron japanned body, anti-tilting rectangular grate, male threaded outlet, unless otherwise specified.

SERIES 1600

Heavy cast iron japanned body, anti-tilting rectangular grate, female threaded outlet, unless otherwise specified.

OPTIONAL

Galvanized or all brass body—brass, white metal or chrome plated top—female threaded inside caulk or spigot bottom outlet, female threaded hub or spigot and side outlet, spun copper ball back water valve.

Type	Dimensions in inches A	B	B′	C	Depth	Weight, lbs.
SERIES 560AG						
562AG	2	10	11	16	10	59
563AG	3	10	11	16	10	59
564AG	4	10	11	16	10	59
SERIES 660						
664	4	14	15¼	21	13	129
665	5	14	15¼	21	13	129
666	6	14	15¼	21	13	129

Type	Dimensions in inches A	B	Weight, lbs.
SERIES 760B			
762B	2	9x12	60
763B	3	9x12	60
764B	4	9x12	60
765B	5	9x12	60
766B	6	9x12	60
SERIES 5300X			
5302X	2	8½	10½
5303X	3	8½	10½
5304X	4	8½	10½
SERIES 1500			
1502	2	12x4½	15
1503	3	12x4½	16
1504	4	12x4½	17

Type	Dimensions in inches A	B	Weight, lbs.
SERIES 5200X			
5202X	2	Dome	11
5203X	3	Dome	11
5204X	4	Dome	11
SERIES 5320X			
5322X	2	8½	10
5323X	3	8½	10
5324X	4	8½	10
SERIES 1600			
1604	4	14x6½	33
1605	5	14x6½	34
1606	6	14x6½	35

JOSAM HEAVY DUTY FLOOR DRAINS WITH TRAP

SERIES 1080

Flushing rim and baked white enamel interior, insure complete sanitation. Opening for jet is provided to permit trap to be easily flushed and cleaned. Trap is self-cleansing with no fouling spaces.

Cast iron japanned body with baked white enamel interior, polished brass top with special hinged, perforated, brass grate, recessed female threaded outlet, unless otherwise specified.

SERIES 1080A

Identical with series 1080 but without trap.

SERIES 710A

For floors where large drainage facilities are required, where waste water contains quantities of sediment and where there is a possibility of back water through waste lines. The rounded corners of the sediment bucket eliminate fouling and the bucket is equipped with hand grips permitting easy removal for emptying.

Heavy cast iron japanned body, hinged grate, removable bucket, threaded brass cleanout, recessed female threaded outlet, without brass back water valve, unless otherwise specified.

SERIES 750A

For floors where a combined drain and double wall deep seal self-cleansing trap with flush cleanout is required, and where there is a possibility of back water through waste lines. Self cleansing trap has no fouling space and due to its being same size as outlet, insures full water way.

Heavy cast iron japanned body, anti-tilting grate, threaded brass cleanout plug, all brass back water valve, spigot outlet, unless otherwise ordered.

SERIES 850A—With exposed flush cleanout.

A recently designed combined drain and trap which provides a moderately priced unit of ample dimensions, rugged construction, and with a practical and positive removable all-brass back water valve and seat.

Cast iron japanned body and grate, spigot outlet, with brass backwater valve, unless otherwise specified.

Series 860A—With internal cleanout.

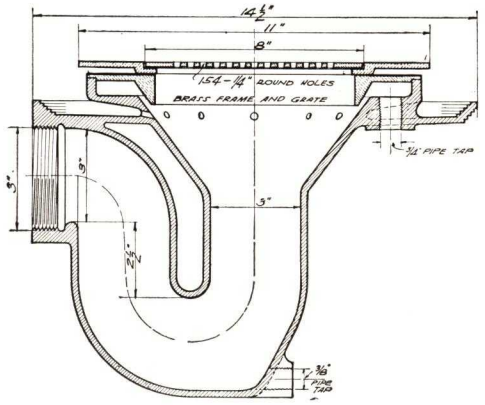
Series 870A—Without cleanout.

OPTIONAL

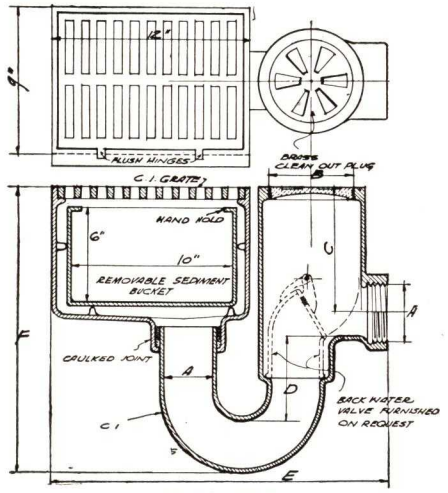
Galvanized iron body—brass, white metal, or chrome plated top—bottom outlet furnished female threaded or spigot connection—side outlet with threaded hub or spigot connection.

Type	Dimensions in inches						Weight, lbs.
	A	B	C	D	E	F	
SERIES 1080							
1082	2	8	.....	.....	.....	.....	53
1083	3	8	.....	.....	.....	.....	53
SERIES 710A							
712A	2	4	7¼	4	19	14½	88
713A	3	5	7	5	20	17	97
714A	4	6	6¾	5	21	18	108
716A	6	8	6½	5	28	20½	128
SERIES 750A							
752A	2	20¾	4¼	11	4	4	40
753A	3	21¾	4	14	5	5	52
754A	4	23¾	4½	16	5	6	70

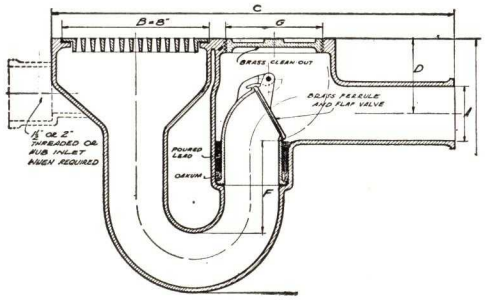
SERIES 850A			SERIES 860A			SERIES 870A		
Type	Size, in.	Weight, lbs.	Type	Size, in.	Weight, lbs.	Type	Size, in.	Weight, lbs.
852A	2	25	862A	2	25	872A	2	25
853A	3	38	863A	3	38	873A	3	38
854A	4	52	864A	4	52	874A	4	52



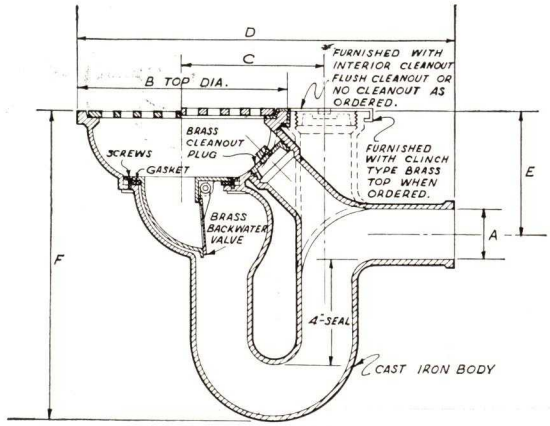
Series 1080



Series 710A



Series 750A



Series 850A

GENERAL APPLICATIONS

SERIES
1080
1080A

Floors in
Hospitals
Kitchens
and other
Floor Areas
where complete sanitation by thorough flushing is required.

SERIES
710A
750A
850A

Boiler Rooms
Coal Rooms
Ash Pits
Basements
Scale Pits
Elevator Pits in
Schools
Garages
Industrial Plants
Warehouses
Packing Plants
Public Buildings
Prisons
Institutions
Power Plants
Breweries

See the Following Pages for Other Types of Floor Drains

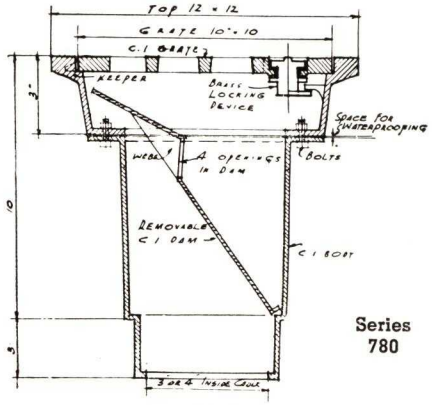
Josam PRODUCTS

GENERAL APPLICATIONS

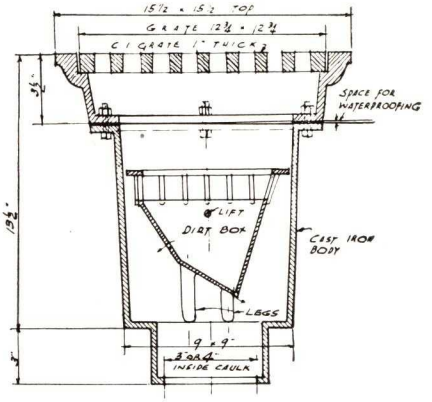
•

Courts
Loading Platforms
Boiler Rooms
Large Floor Areas
in
Packing Plants
Industrial Plants
Breweries
Dairies
Warehouses
Garages
Stock Barns
Stables

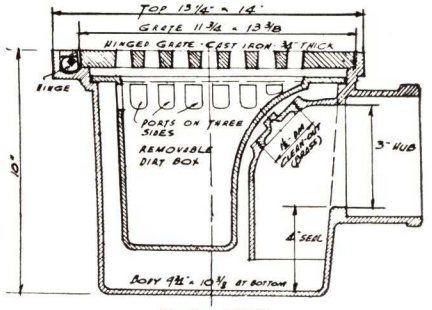
JOSAM HEAVY DUTY FLOOR DRAINS



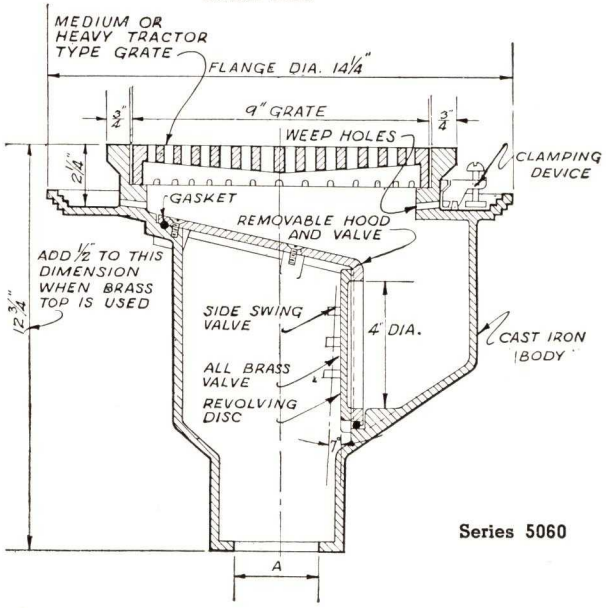
Series 780



Series 790



Series 7000



Series 5060

SERIES 780

For use wherever waste water contains sediment which should be prevented from entering waste lines.

The cast iron removable dam is tapered and fits tightly in the body of the drain. It is designed to deflect all incoming drainage into the drain, forcing all liquids to pass through the ports in the dam and depositing the heavy debris and sediment in its proper place in drain body.

Heavy cast iron japanned body, locking type grate, removable dam, bottom outlet for inside caulking, unless otherwise specified.

SERIES 790

Body is constructed to receive lead or other waterproofing membrane. Sediment container is easily removed for cleaning.

Heavy cast iron japanned body, 1-in. thick grate, removable dirt box, bottom outlet for inside caulking, unless otherwise specified.

SERIES 7000

Shallow rugged construction, ample waterway, and large storage capacity for sediment.

The flange of the removable sediment container fits tightly into the drain body, thereby forcing all incoming drainage into the bucket.

The threaded brass cleanout in the trap leg above the water line affords easy cleaning of trap or waste line.

Heavy cast iron japanned body, removable sediment container, threaded brass cleanout, hub outlet, unless otherwise specified.

Type	Dimensions in inches		Weight, lbs.
	A	B	
SERIES 780			
783	3	10x10	56
784	4	10x10	56
783A	3	14x14	95
784A	4	14x14	95
785A	5	14x14	98
786A	6	14x14	98
SERIES 790			
793	3	12¾x12¾	90
794	4	12¾x12¾	90
795	5	12¾x12¾	90
SERIES 7000			
7003	3	11¾x13⅜	60
7004	4	11¾x13⅜	60

SERIES 5060

A recently designed drain with combined backwater valve which provides ample drainage and positive closing against backwater. The valve housing is easily removed for cleaning the drain, and the side swing feature of the disc allows greater area of water way.

Regularly furnished cast iron japanned with tractor type grate, brass backwater valve, outlet for inside caulking unless otherwise specified.

Dimensions in inches		
Type	Outlet	Top
5062	2	10
5063	3	10
5064	4	10

OPTIONAL

Galvanized iron body—brass, white metal, or chrome plated top—bottom outlet furnished female threaded inside caulk or spigot—side outlet furnished threaded, hub or spigot.

See the Preceding Pages for Other Types of Floor Drains

JOSAM OPEN SEAT BACK WATER SEWER VALVES

JOSAM BACKWATER SEWER VALVES PROTECT PROPERTY, EQUIPMENT AND MERCHANDISE

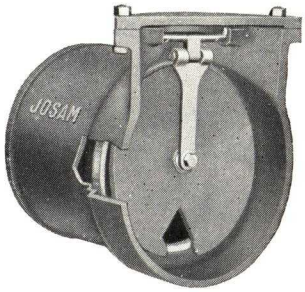
Floor drains and fixtures will act as open inlets rather than outlets, allowing water and sewage to enter basements and cause damage when there is excessive rain, tidewater or inadequate sewer carry-off. When this occurs, damage to property, equipment, and merchandise results . . . foundations are undermined, equipment is ruined, and merchandise destroyed. This can be eliminated by the installation of Josam Open Seat Backwater Sewer Valves at proper points in the main drain line and branches where floor drains and fixtures are installed in the basement.

SERIES 1100
(Vertical Swing Flap)
With Iron Bolted Down
Cleanout Cover

SERIES 1140
(Vertical Swing Flap)
With Brass Threaded Cleanout
Cover

SERIES 1170
(Side Swing Flap)
With Iron Bolted Down
Cleanout Cover

SERIES 1180
(Side Swing Flap)
With Brass Threaded Cleanout
Cover



SERIES 1100½

The flap mechanism is identical in design, construction and operation of Series 1100.

When placed at the discharge end of sewer lines, the Josam Flap Valve is an absolute safeguard against back flow of sewage.

Also recommended for use between settling basins in sewage disposal plants. Same sizes as Series 1100.

GENERAL DESCRIPTION

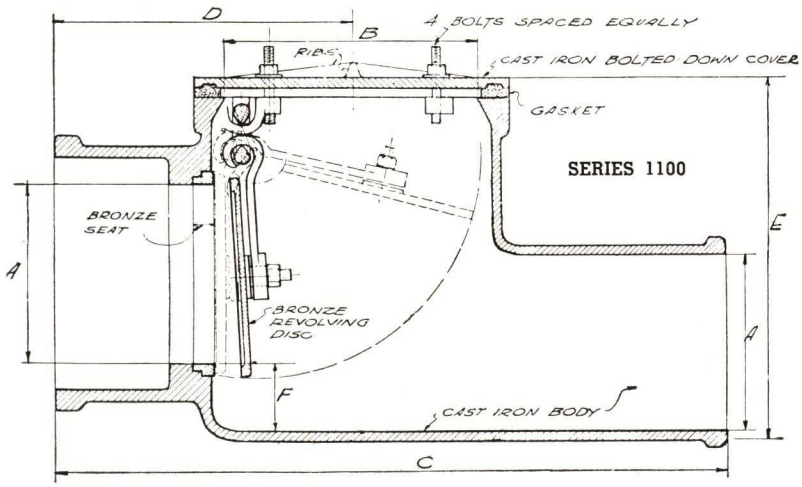
Josam Backwater Sewer Valves are available with either vertical or side-swing brass flaps. The valve bodies for Josam Backwater Sewer Valves are the same for both the vertical and side-swing flaps. The valve body directly beyond the flap or disc is offset 1½ in. to 3½ in. below the valve seat depending on size of valve, which precludes the possibility of fouling the valve.

GENERAL CONSTRUCTION

Cast-iron japanned body, hub inlet and spigot outlet, bolted down cleanout cover 2 in. larger than outlet for easy accessibility, unless otherwise specified. Can be provided with hub connection for use with tile sewer pipe, when so specified. Also furnished with machined faced and drilled flanged ends. To bring cleanout flush with floor level, extensions of variable heights are furnished at additional cost.

Type		Dimensions in inches						Weight, lbs.
		A	B	C	D	E	F	
Series 1100	Series 1170	SERIES 1100 AND 1170						
1102	1172	2	4¾	13½	6⅛	5⅜	1⅜	18
1103	1173	3	5⅝	14¾	6½	7	1⅜	26
1104	1174	4	6⅜	15¼	6⅞	8⅛	1½	32
1105	1175	5	8⅜	18¾	8	11	1½	50
1106	1176	6	8⅜	20½	8¾	11¼	1½	60
1108	1178	8	10¾	22¼	9¾	13½	1½	115
1110	.....	10	13	24	11¾	16½	2	190
1112	.....	12	15	25¾	12¼	18	2	250
1115	.....	15	18⅜	32½	14⅝	24	3	540
1118	.....	18	22½	36¾	17½	35⅜	3⅛	780
1124	.....	24	30¼	45	20¼	35¾	3¼	1650
1130	.....	30	36¼	51	24¾	42¼	3½	2400
1140	1180	SERIES 1140 AND 1180						
1142	1182	2	4	13½	6⅛	4⅞	1⅜	18
1143	1183	3	5	14¾	6½	6½	1⅜	26
1144	1184	4	6	15¼	6⅞	8¾	1½	32
1145	1185	5	8	18¾	8	11½	1½	50
1146	1186	6	8	20½	8¾	11¾	1½	60
1148	1188	8	10	22¼	9¾	11¼	1½	115

Series 1100½ made in sizes from 2 in. to 30 in.



See Pages 11 and 12 for Josam Drains Equipped with Backwater Valves

Josam PRODUCTS

GENERAL APPLICATIONS

•

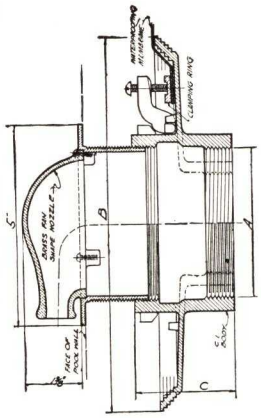
Swimming and Wading Pools in Schools Colleges Clubs Hotels Institutions Residences Parks

JOSAM SWIMMING POOL EQUIPMENT

ANOTHER JOSAM SERVICE . . . a recently published 48 page book on construction, sanitation and operation of swimming pools. This publication contains clear and authoritative basic information and technical data including layouts and plans of all types of swimming and wading pools, construction details, pool water supply, water purification, transmission of infection, operation, salt water pools, pools for special purposes, ornamental and garden pools.

A copy of this Treatise, which sells for $1.00, will be sent to you gratis, by writing direct to us and mentioning "SWEET'S".

JOSAM SWIMMING POOL CONNECTION WITH BRASS FAN SHAPED INLET



Series 320CF

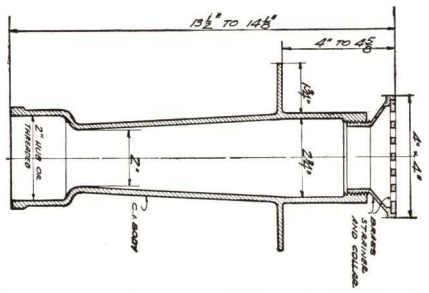
For use in swimming pool walls as inlet or circulating connection. When used as an inlet it deflects the water down the wall of pool. Can be set at any lateral angle. Clamping device assures a watertight connection. Cast iron body with brass, adjustable fan shaped inlet.

Type	Dimensions in inches		
	A	B	C
321½CF	1½	9¼	3
322CF	2	9¼	3
323CF	3	9¼	3¼
324CF	4	10¼	3¼

JOSAM SWIMMING POOL INLET, OUTLET OR OVERFLOW CONNECTION FOR WATER SUPPLY OR CIRCULATING LINES

Series 2240H

Body is sufficiently long to extend through wall of pool, and the flat flange acts as an anchor in the construction or can be used to attach waterproofing membrane. Cast iron body with brass, square, adjustable strainer which provides means for meeting variations in thickness of pool wall construction.



Type	Dimensions in inches	
	Outlet	Strainer
2242H	2	4x4
2263H	3	6x6

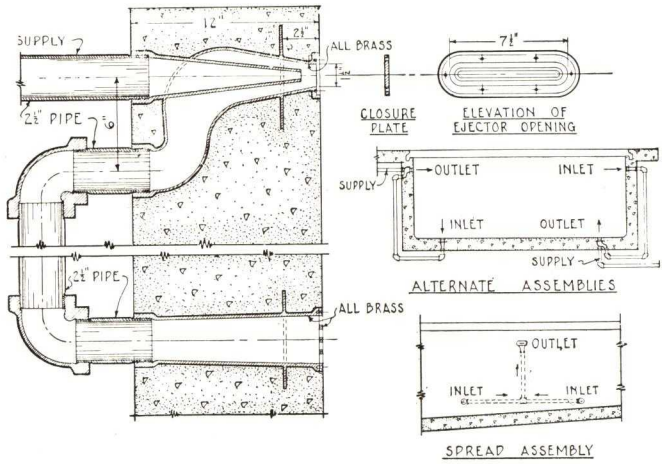
JOSAM CIRCULATING EJECTOR OUTLETS AND INLETS

Series 1800

A recently developed novel type of inlet which works on the principle of an injector so that the entering stream of fresh water causes a secondary circulation of water already in the pool through the auxiliary inlets and piping.

This secondary circulation keeps all water in constant motion to a distance of 10 to 20 ft. out from the wall or floor in which the inlets are placed, thus doing away with "dead spots" between or below the inlets, and also effecting a thorough commingling of the incoming water with that already in the pool.

All brass one piece construction, 2½ in. female threaded connection from pump and adjacent inlet piping, chrome plated outlet face place 1½ in. x 7½ in. opening. Chrome plated closure plate furnished when specified, to inject water into pool without syphonage.

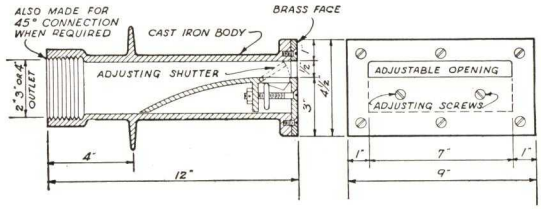


JOSAM ADJUSTABLE NOZZLE

Series 2020

Adjustable type of nozzle permits water volume delivered at each inlet to be accurately determined and locked so that the desired volume of water will be permanently delivered.

All brass construction, 2½ in. female threaded connection, chrome plated face plate.



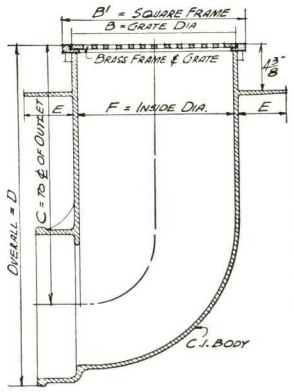
Type	Dimensions in Inches	
	Outlet	Face
2022	2	4½x9
2023	3	4½x9
2024	4	4½x9

See the following pages for other Swimming Pool Fittings

JOSAM SWIMMING POOL EQUIPMENT (Continued)

JOSAM SWIMMING POOL MAIN OUTLET DRAIN

Series 590M



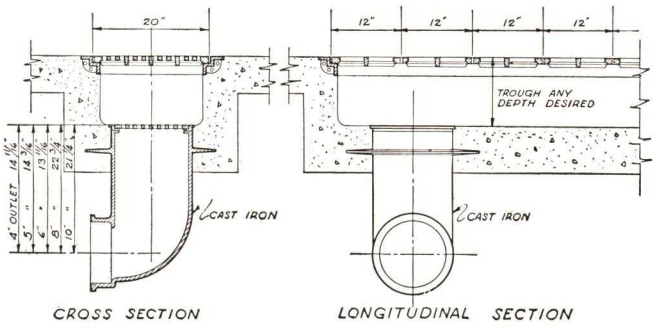
For use where construction requires a side outlet drain with an exceptionally large drainage area to allow for quick drainage of pool. Heavy cast iron body, brass square frame and brass round grate.

Type	Dimensions in inches						
	Outlet	B	B'	C	D	E	F
594M	4	11	12x12	14 11/16	18	2½	10
595M	5	11	12x12	14 13/16	18	2½	10
596M	6	11	12x12	13 11/16	18	2½	10
598M	8	14	15¼x15¼	22¾	28½	4	13⅛
599M	10	14	15¼x15¼	21¾	28½	4	13⅛

JOSAM MAIN OUTLET DRAIN—TROUGH TYPE

For wide pools where two or more outlets should be used, Series 590M can be set in a trough of any depth desired, with grates set in 12 in. or 20 in. direction and frame constructed accordingly. Outlets can be set on sides to keep elevation of main drain pipe as high as possible.

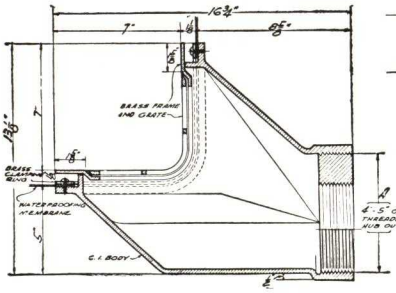
All brass 12 in. x 20 in. grates, in chrome plated, polished brass or nickel plate. (Brass frame for trough not furnished by Josam.)



JOSAM REVERSIBLE ANGLE SWIMMING POOL MAIN OUTLET DRAIN

Series 1200

For use where large capacity outlet drain in floor angle of pool is desired. Can be set horizontal or vertical to conform to pool construction and piping layout. Clamping ring holds waterproofing membrane to drain body, making watertight connection. Heavy cast iron body, brass frame and removable grate, brass clamping device.



Type	A., in.
1204	4
1205	5
1206	6

Series 1230

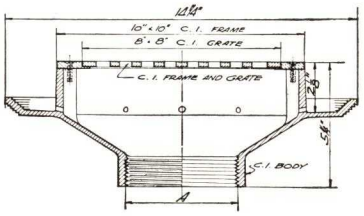
—Same construction except a lighter weight drain and smaller drainage area, made in sizes 2 in., 3 in. and 4 in. only.

JOSAM DOUBLE DRAINAGE SWIMMING POOL MAIN OUTLET DRAIN

Series 580SB

Large drainage area permits rapid emptying of pool water. Cast iron body, brass square frame and brass square grate.

Type	Dimensions in in.	
	Outlet	Grate
582SB	2	8x8
583SB	3	8x8
584SB	4	8x8

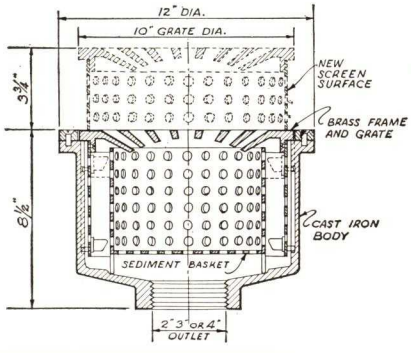


JOSAM PROMENADE DRAIN WITH SEDIMENT BASKET

Series 1900

Recommended to prevent solid matter entering waste lines and accumulating on screens, hair catchers and filters. When sediment basket is completely filled and surrounding area is flooded, surface can be drained by lifting the top of drain and a secondary screen surface comes into play and takes care of the surrounding water and debris, after which, the basket can be removed for cleaning and the drain top placed in its normal position.

Cast iron body with chrome plated brass top, 2 in., 3 in. or 4 in. outlet for threaded or caulk connection.

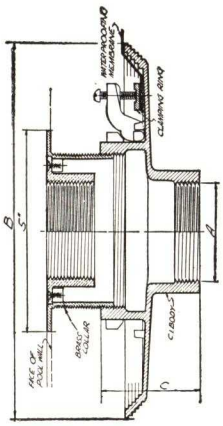


Type	Dimensions in inches	
	Outlet	Top Dia.
1902	2	12
1903	4	12
1904	3	12

JOSAM SWIMMING POOL ATTACHMENT FOR VACUUM CONNECTION

Series 310CV

Installed horizontally in pool wall for vacuum cleaner connections. Cast iron body with brass vacuum connection adjustable to meet variation in pool wall thickness. Clamping device assures a watertight connection.



Type	Dimensions in inches		
	A	B	C
311½CV	1½	9¼	3
312CV	2	9¼	3
313CV	3	9¼	3¼
314CV	4	10¼	3¼

See the following pages for other Swimming Pool Fittings

Josam PRODUCTS

GENERAL APPLICATIONS

•

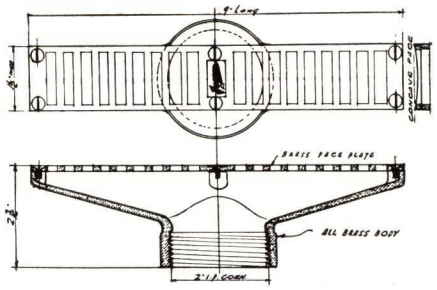
Swimming and Wading Pools

in

Schools
Colleges
Clubs
Hotels
Institutions
Residences
Parks

JOSAM SWIMMING POOL EQUIPMENT (Continued)

ALL BRASS SCUM GUTTER DRAINS



Series 2290E

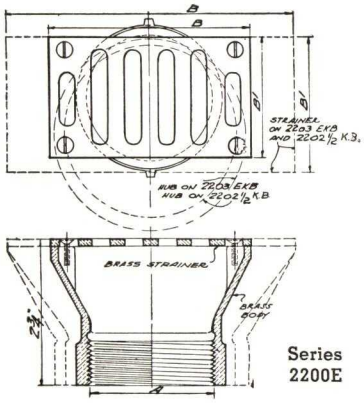
Type	Dimensions in inches	
	Outlet	Strainer
2291½E	1½	9x1½
2292 E	2	9x1½

Series 2290E

For use in swimming pool scum gutters or wherever a drain with ample drainage area is required. Slots in strainer parallel direction of flow into scum gutter. Inner contour of body affords quick drainage. All brass body with concave strainer. Also furnished with flat strainer.

Series 2200E

For scum gutters or similar places where a narrow but efficient drain is required. Rectangular shaped strainer insures adequate water way. Slots in strainer face parallel direction of flow into scum gutter. Cast brass body and flat strainer. Also furnished with concave face plate.

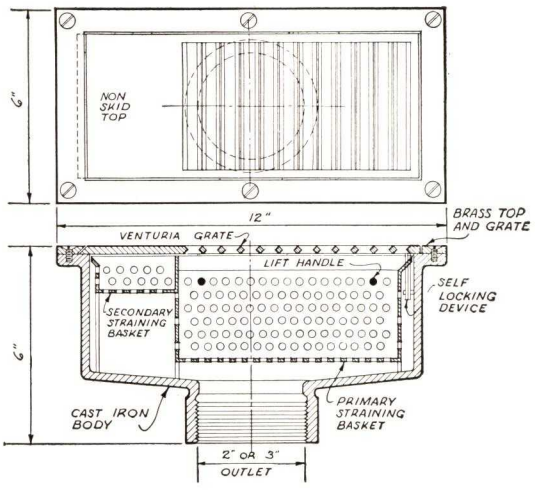


Series 2200E

Type	Dimensions in inches		
	A	B	B'
2201½E	1½	3¾	2¼
2202E	2	3¾	2¼
2202½	2½	5⅜	2½
2203E	3	5⅜	2½

JOSAM SCUM GUTTER DRAIN WITH PRIMARY AND SECONDARY BASKETS

Series 1350

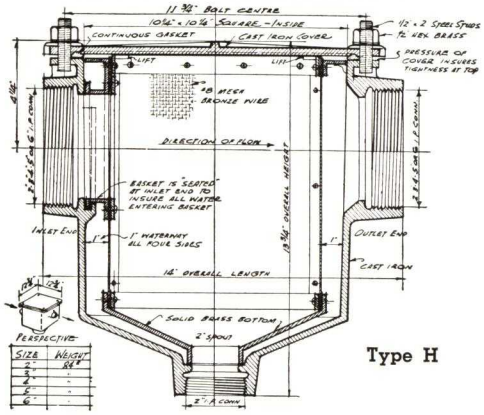


Recommended in gutters where floating debris is to be intercepted and prevented from entering and clogging waste lines. When primary basket is completely filled, the waste water remains on top of drain at which time top may be removed and remaining water and debris drained into secondary straining basket. When water has completely drained, baskets can be removed for cleaning.

All brass construction with 2, 2½ or 3 in. threaded or caulking connection.

Type	Dimensions in inches	
	Outlet	Top
1352	2	12 x 6
1352½	2½	12 x 6
1353	3	12 x 6

JOSAM HAIR AND SEDIMENT INTERCEPTOR FOR CIRCULATING LINES WITH BLOW-OUT CONNECTION



Type H

Particularly adaptable as hair catcher in swimming pools, and for use on pressure line to pumps, filters, water softeners and bleaching tanks, for the interception of hair, lint, sand, gravel and other solids and small particles which should be prevented from entering lines to any equipment.

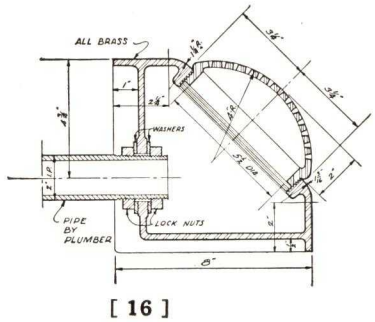
Basket is easily removed for cleaning. Solid cast brass hopper shape bottom of the screen basket is threaded for 2 in. I. P. blow-out valve for use in temporary cleaning of interceptor without shutting down line.

Heavy cast iron grey enamel body, removable gasket tight cover, bronze wire screen basket. Designed for 150 lb. pressure. Made 2, 3, 4, 5 and 6 in. connections. Type HH made in 8 and 10 in. connections.

JOSAM SHOWER DOMES
Series 2100

A recently developed unit which aerates water and tends to reduce its temperature by evaporative cooling in swimming and diving pools. Also for use in and around children's wading pools, as a shower bath and for amusement. The spray of water is thrown upward through the dome, eleminating the possibility of stinging or irritation to bathers, and the design of the water apertures is such that the individual streams break up into fine mist if any considerable water pressure is used.

All brass construction with removable dome; side outlet for 2 in. pipe with double locknuts. Also furnished with 2 in. bottom tapped outlet.



See the preceding pages for other Swimming Pool Fittings

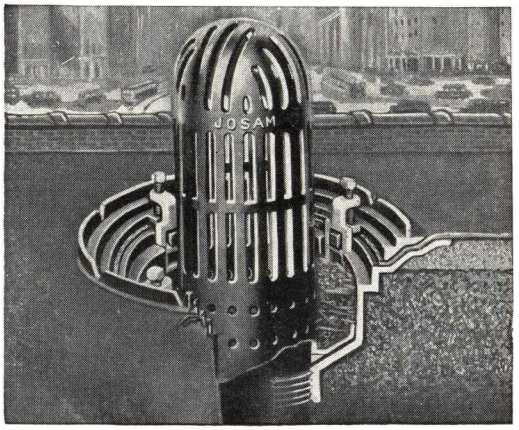
JOSAM ROOF DRAINS

Josam Roof Drain Features

The removable dome strainer and sediment cup applied to roof drains, was originated by us and is an exclusive Josam feature.

The sediment cup or retainer is located below the roof level, thereby providing for the accumulation of sediment and other debris in the retaining space and permitting and providing for the outlet of water at a much greater flow than any other design, all of which, have outlet area only above the level of the roof.

The sediment cup or retainer catches and holds sediment and other debris, thereby preventing it from entering the drainage line, and can be cleaned easily by lifting it out to remove accumulated sediment and debris.



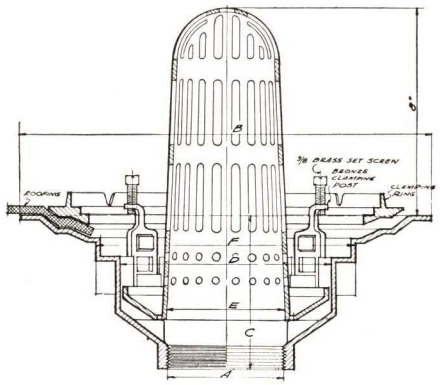
The dome strainer and sediment cup has an outlet area considerably greater than the outlet area of the pipe line to which it is connected.

Removing the sediment cup and strainer does not interfere with the clamping ring and the water-tight connection with the roofing. The clamping devices used on Josam roof drains are Josam designs and provide a positive unperforated water-tight leak-proof connection.

SERIES 410S

The large body diameter and height of the removable combined dome strainer and sediment cup, assures ample drainage area both above and below the roof line. The improved type gravel stop clamping ring holds the roofing felts to the drain body by means of four heavy bronze adjustable clamping posts. These posts have two major vertical adjustments to allow for varying thickness of roofing material.

Heavy cast iron japanned body, combined dome strainer and sediment cup, female threaded outlet, unless otherwise specified.

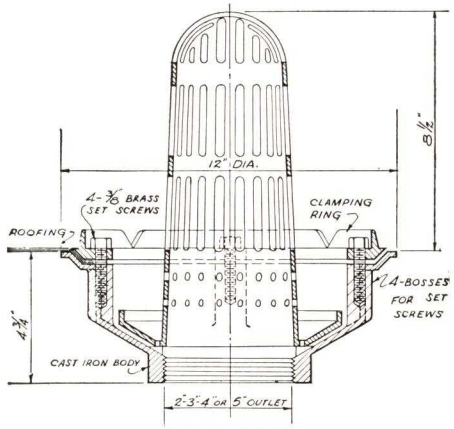


Series 410S

SERIES 460GS

A recently developed roof drain moderately priced, having the removable combined dome strainer and sediment cup feature and a clamping ring to securely hold the roofing felts to the drain body.

Heavy cast iron japanned body and dome strainer, female threaded outlet, unless otherwise specified.



Series 460GS

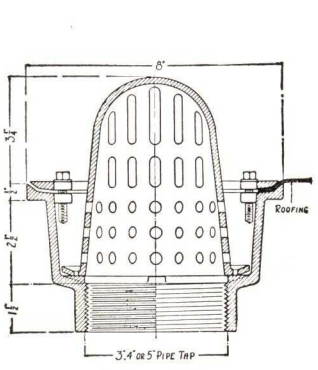
SERIES 450G

For use in formed and lined valleys or gutters not less than 8 in. in width. The metal or other lining of the valley or gutter, or the roofing material is held firmly in place, without perforation, by the clamping ring which is fastened by three brass bolts, making a water-tight connection between roofing material and drain. Dome strainer and sediment cup provides ample drainage area. When used for draining built up areas, a gravel stop clamping ring is provided.

Cast iron japanned body, removable dome strainer, female threaded outlet, unless otherwise specified.

Type	Dimensions in inches						Weight, lbs.
	A	B	C	D	E	F	
SERIES 410S							
412S	2	16	6	8⅜	5	10¼	38
413S	3	16	6	8⅜	5	10¼	38
414S	4	16	6	8⅜	5	10¼	38
415S	5	17¼	6	9⅜	5½	11⅜	48
416S	6	18¼	6	10⅜	6½	12¼	56
418S	8	20⅛	7	12¼	8½	14½	70

SERIES 450G				SERIES 460GS			
Type	Outlet	Top	Weight	Type	Outlet	Top	Weight
452G	2″	8″	13 lbs.	462GS	2″	12″	.....
453G	3″	8″	13 lbs.	463GS	3″	12″	.....
454G	4″	8″	13 lbs.	464GS	4″	12″	.....
455G	5″	8″	14 lbs.	465GS	5″	12″	.....



Series 450G

OPTIONAL

Galvanized; all brass; brass dome; square top flange; female threaded, inside caulk or spigot bottom outlet; threaded hub or spigot side outlet.

See the Following Pages for Other Types of Roof Drains

Josam PRODUCTS

GENERAL APPLICATIONS

•

SERIES 450S 460GSP

Promenade Deck

•

SERIES 410SEJ

Flat Roof of
Concrete
Cement
Cement Tile
Hollow Tile
Gypsum
Pre-cast Slab
Wood
Composition

•

SERIES 2010S

Cornices
Window Sills
Balconies

See the following pages for other types of Roof Drains

JOSAM ROOF DRAINS

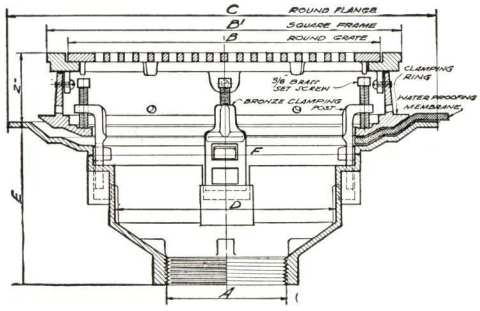
SERIES 420SP

The bottom portion of the collar supporting the frame and grate holds the waterproofing membrane to the drain body by means of four heavy bronze adjustable clamping posts which have two major vertical adjustments. This forms a water-tight connection between the membrane and the drain body, eliminating the use of a metal flashing of any kind.

Heavy cast iron japanned body, square frame and anti-tilting round grate, 2-in. high collar, female threaded outlet unless otherwise specified.

Type	Dimensions in inches							Wt., lbs.
	A	B	B′	C	D	E	F	
422SP	2	11¾	13¼	16	8⅜	6	10¼	43
423SP	3	11¾	13¼	16	8⅜	6	10¼	43
424SP	4	11¾	13¼	16	8⅜	6	10¼	43
425SP	5	12¾	14¼	17¼	9⅜	6	11⅜	56
426SP	6	13¾	15¼	18¼	10⅜	6	12¼	63
428SP	8	13¾	15¼	20⅛	12¼	7	14½	67

440BSP Series—Same detail as 420SP but body of drain has double drainage flange.



Series 420SP

SERIES 460GSP

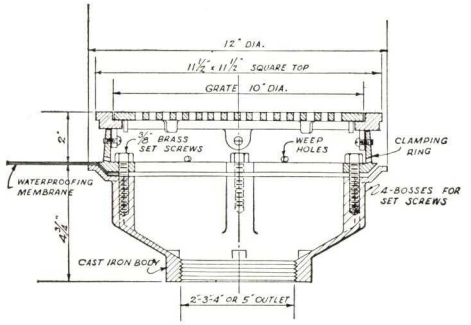
A recently developed roof drain for promenade roofs, where a moderately priced drain is required and where ample drainage area is provided in addition to the positive clamping feature assuring a water-tight connection between roofing felts and drain body.

Cast iron japanned body and grate, female threaded outlet unless otherwise specified.

OPTIONAL

Galvanized; all brass; brass top; female threaded, inside caulk or spigot bottom outlet; female threaded, hub or spigot side outlet.

SERIES 460GSP			
Type	Outlet, in.	Top, in.	Weight, lbs.
462GSP	2	12x12	.....
463GSP	3	12x12	.....
464GSP	4	12x12	.....
465GSP	5	12x12	.....



Series 460GSP

JOSAM ROOF DRAIN WITH INTEGRAL EXPANSION JOINT

SERIES 410SEJ

All movable parts are accessible from inside the roof drain from roof level, by simply removing the dome.

This is a feature which is entirely new and does not exist on any other make of expansion joint or roof drain.

It eliminates the necessity of providing access panels for adjustment of the expansion joint.

It prevents expansion joint from being buried in wall or other inaccessible places.

It is more convenient to adjust at roof level than to provide ladder to ceiling above the floor.

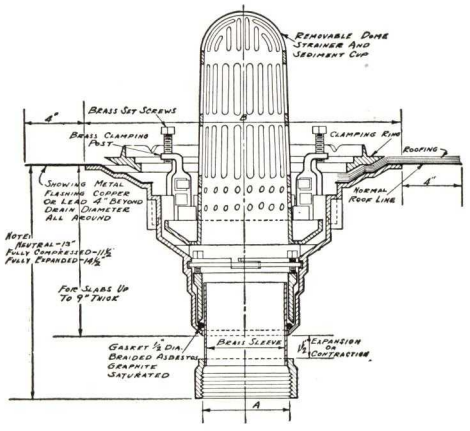
Electric wires, piping, etc., often make it very inconvenient to get to expansion joint below ceiling at roof.

The vertical space for installation of a combined unit is less than for roof drain and separate expansion joint.

It provides ready means of access for adjustment or renewal of movable parts.

The design of drain body, clamping ring and dome is identical to Josam Series 410S roof drain.

Regularly furnished cast iron drain body, dome and clamping ring with brass clamping posts. Integral expansion joint with brass sleeve, cast iron gland ring and locking ring, brass compression screws, asbestos gasket, female threaded outlet. Spigot outlet when so specified.

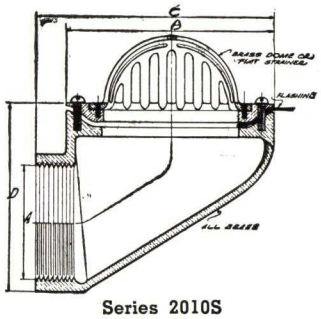


Series 410SEJ

Type	Dimensions in inches				Weight, lbs.
	A Outlet	B Strainer	C	D	
SERIES 410SEJ					
412SEJ	2	16	.....	.....	46
413SEJ	3	16	.....	.....	54
414SEJ	4	16	.....	.....	57
415SEJ	5	17¼	.....	.....	66
416SEJ	6	18¼	.....	.....	75
418SEJ	8	20⅛	.....	.....	95
SERIES 2010S					
2012S	2	4⅜	5	4	5
2013S	3	5¾	6⅜	5	7½
2014S	4	5¾	6⅜	6	9½

JOSAM ALL-BRASS CORNICE, BALCONY OR SILL DRAIN

For draining overhanging cornices, small balconies and similar areas in order to prevent drip to lower portions of building structure. Collar acts as clamping ring holding flashing securely in place. All brass, shallow type body, 45° or 90° off vertical. Also furnished with flat or bee-hive strainer.



Series 2010S

JOSAM ROOF DRAINS

JOSAM ALL BRASS ANGLE CORNICE DRAIN

SERIES AA-BB-CC

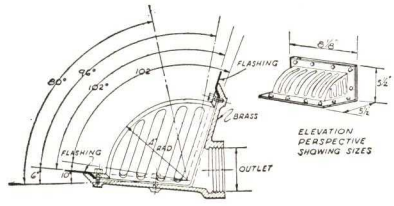
For use where drain is located at joining of roof and parapet wall.

Large waterway due to all exterior surfaces of the barrel being slotted.

The flange of the barrel acts as the clamping member for attaching roof flashing.

Made in several angles to meet various types of parapet wall construction.

Heavy rough brass body and removable barrel strainer, female threaded outlet on a true horizontal.



Series AA-BB-CC

SERIES AA-BB-CC

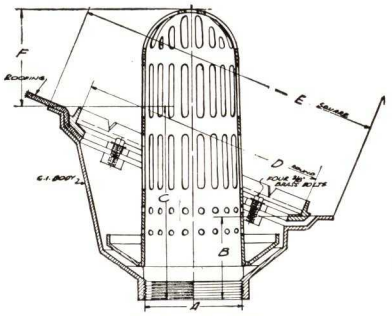
Type	Outlet, ins.	Weight, lbs.
102° opening off a 6° above horizontal		
AA2	2	13
AA3	3	13
AA4	4	13
96° opening off a 6° above horizontal		
BB2	2	13
BB3	3	13
BB4	4	13
80° opening off a true horizontal		
CC2	2	13
CC3	3	13
CC4	4	13

JOSAM SAW TOOTH ROOF DRAIN

SERIES 490C

Types are available for ordinary roof pitches but drains can be furnished for any pitch specified. The outlet is so placed that no offset around the steel construction is required, to waste line. The combined dome strainer and sediment cup is easily removable and assures ample drainage area, eliminating the possibility of clogging the drain.

Heavy cast iron japanned body, combined dome strainer and sediment cup, female threaded outlet, unless otherwise specified.



Series 490GC

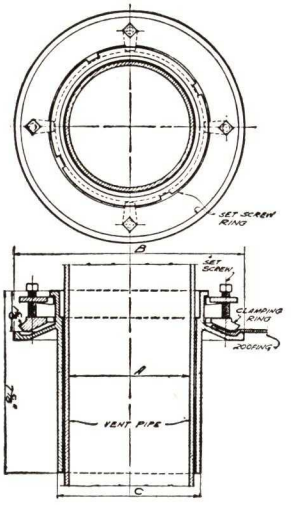
JOSAM VENT STACK SLEEVE

SERIES 610A

For use in flat roofs where a watertight connection between vent stack and roof is desired. The clamping ring securely holds the roofing felts in place. Space between vent pipe and sleeve should be filled with roofers elastic cement or oakum and poured lead joint, thereby making a watertight joint between sleeve and pipe.

Also for use in supporting base of flag pole.

Cast iron japanned body, clamping ring and pressure ring with brass set screws, unless otherwise specified.



Series 610A

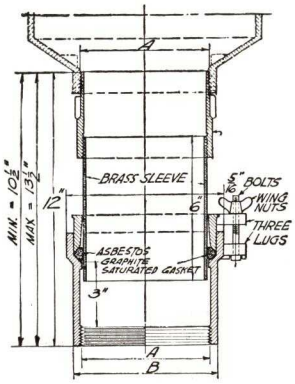
JOSAM EXPANSION JOINT

SERIES 6000

For use with any Josam Drain, in any line where there is expansion and contraction. The heavy gauge brass sleeve has a smooth non-corrosive surface working freely against a graphite saturated, round, braided asbestos packing ring. The ring is held in place by means of a gland ring which is tightened by three wing nuts, thereby assuring a watertight and airtight joint.

Heavy cast iron japanned body and ring, brass sleeve, male threaded top and female threaded bottom, unless specified with hub top and spigot bottom.

Type	Dimensions in inches A	B	C	D	E (square)	F	Weight, lbs.
SERIES 490GC							
492GC	2	3	.....	11 3/8	14 1/4	4 1/2	38
493GC	3	3	.....	11 3/8	14 1/4	4 1/2	38
494GC	4	3	.....	11 3/8	14 1/4	4 1/2	38
495GC	5	3 7/8	.....	13	15 7/8	4	48
496GC	6	3 7/8	.....	13	15 7/8	4	52
SERIES 610A							
611½A	1½	6	2 3/4	.....	.....	.....	8
612 A	2	6 3/4	3 1/4	.....	.....	.....	9
612½A	2½	7	3 3/4	.....	.....	.....	10
613 A	3	7½	4 1/4	.....	.....	.....	11
614 A	4	8 3/4	5 1/4	.....	.....	.....	15
615 A	5	9 3/4	6 1/4	.....	.....	.....	20
616 A	6	10 3/4	7 1/4	.....	.....	.....	22
618 A	8	13	9½	.....	.....	.....	24
SERIES 6000							
6002	2	3 1/8	3 5/8	.....	.....	.....	7
6003	3	4 1/8	4 5/8	.....	.....	.....	12
6004	4	5 1/8	5 5/8	.....	.....	.....	15
6005	5	6 1/8	6 5/8	.....	.....	.....	18
6006	6	7 1/8	7 5/8	.....	.....	.....	20
6008	8	9½	9 5/8	.....	.....	.....	32



Expansion Joint 6000

Josam PRODUCTS

GENERAL APPLICATIONS

•

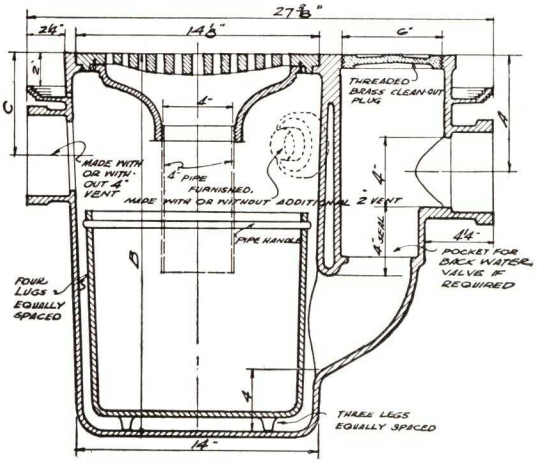
Wash Racks
Driveways
Boiler Rooms
Ash Pits
Large Floor Areas
Ramps

in

Garages
Industrial Plants
Oil Refineries
Packing Plants
Warehouses
Machine Shops
Cleaning and Dyeing plants
Filling and Bulk Stations
Fleet Truck Garages
Public Buildings

See the following page for other oil intercepting devices

JOSAM DOUBLE DRAINAGE GARAGE AND HEAVY DUTY INDUSTRIAL DRAINS

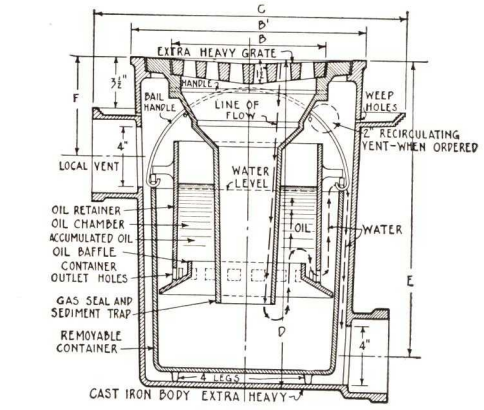


Series 900G

SERIES 900G

For floors of various thicknesses where there is a large volume of waste water containing heavy deposits of foreign matter which should be prevented from entering waste lines. Gas seal cone is recommended where waste water carries gasoline, oil and other volatile matter which tend to gasify in drain or sewer. Heavy cast iron body and grate, sediment retainer, gas seal cone and threaded brass cleanout. Also furnished with backwater valve.

Type	Dimensions in inches						Weight, lbs.
	Max. slab depth	Outlet and vent	Grate	A	B	C	
910G	6	4	14	10¾	22	6¾	255
920G	8	4	14	12¾	24	8¾	280
930G	10	4	14	14¾	26	10¾	305
950G	12	4	14	18¾	30	14¾	355



Series 6100

OIL INTERCEPTING DRAINS

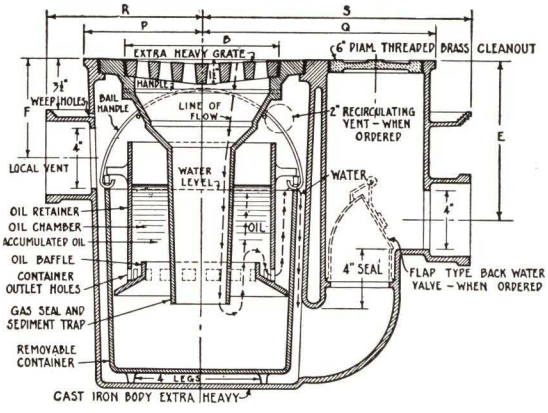
SERIES 6100

Intercepts and retains light and heavy oils, such as gasoline, kerosene, lubricating oils, coal tar oils, benzene, toluene, etc., together with grease, sludge and sediment, discharged into drains with waste water. Prevents clogging of drains, traps and waste pipes by oil and grease. Built for heavy service.

Double drainage type cast iron japanned with deep sediment container, oil retainer, cone type gas seal and sediment trap, extra heavy 10½-in. or 14½-in. grate, 4-in. hub local vent, 4-in. hub outlet. Also made with 3-in., 5-in. or 6-in. outlet.

SERIES 6200

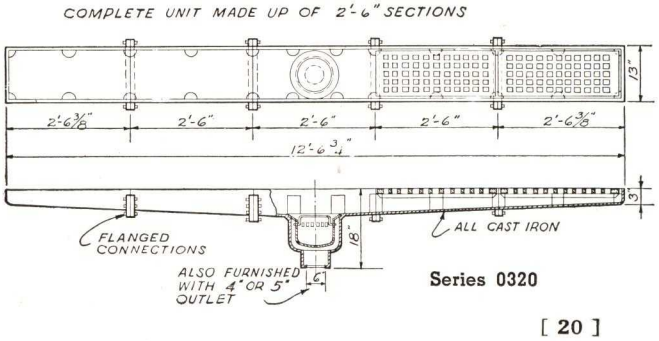
Same construction as Series 6100 except with deep seal trap and 6-in. threaded brass top cleanout, with 2-in., 3-in. or 4-in. hub outlet. Backwater valve optional.



Series 6200

Type	Dimensions in inches											Wt. lbs.
	Max. slab depth*	B	B'	C	D*	E* outlet C/L	F* vent C/L	P	Q	R	S	
SERIES 6100												
6110	4	10½	16	21	22	19¾	6¾	....	....	....	....	266
6120	6	10½	16	21	24	21¾	8¾	....	....	....	....	279
6130	8	10½	16	21	26	23¾	10¾	....	....	....	....	292
6140	12	10½	16	21	30	27¾	14¾	....	....	....	....	317
6150	4	14½	21	27	22	19¾	6¾	....	....	....	....	356
6160	6	14½	21	27	24	21¾	8¾	....	....	....	....	374
6170	8	14½	21	27	26	23¾	10¾	....	....	....	....	387
6180	12	14½	21	27	30	27¾	14¾	....	....	....	....	412
SERIES 6200												
6210	4	10½	....	....	22	10¾	6¾	7¾	15¼	11	17½	302
6220	6	10½	....	....	24	12¾	8¾	7¾	15¼	11	17½	331
6230	8	10½	....	....	26	14¾	10¾	7¾	15¼	11	17½	360
6240	12	10½	....	....	30	18¾	14¾	7¾	15¼	11	17½	418
6250	4	14½	....	....	22	10¾	6¾	10½	17½	13½	20	402
6260	6	14½	....	....	24	12¾	8¾	10½	17½	13½	20	426
6270	8	14½	....	....	26	14¾	10¾	10½	17½	13½	20	450
6280	12	14½	....	....	30	18¾	14¾	10½	17½	13½	20	498

*Increased ½ in. when furnished with brass top.



Series 0320

JOSAM RAMP DRAIN

Recommended for quick carry-off of large volume of surface water. Withstands heavy trucking. Removable sediment bucket retains solids and prevents clogging of waste lines. All cast iron. Furnished with two or more sections of 2 ft. 6 in. x 13 in. wide, flanged connections. Sediment bucket optional.

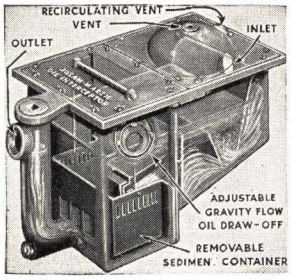
Type	Outlet
0324	4
0325	5
0326	6

JOSAM OIL INTERCEPTORS

PROTECTION AT REASONABLE COST

The expenditure for an installation of a Josam Oil Interceptor is proportionately negligible, but will mean adequate protection against the hazards of grease, oil, gasoline, naphtha and other dangerous residue entering the drainage lines.

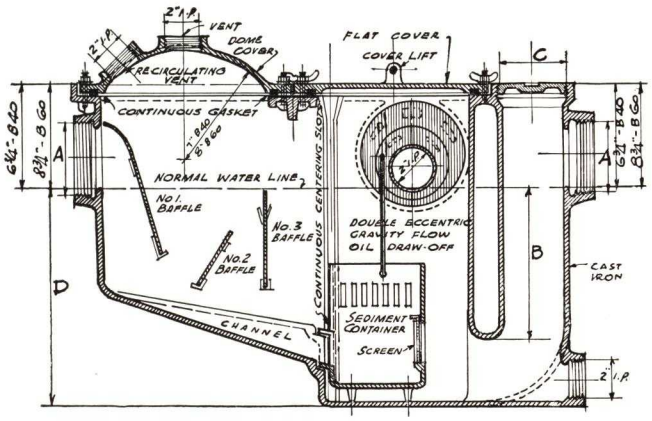
A carelessly dropped lighted match or cigarette . . . a dull roar of a destructive explosion and the quick flare of all-consuming fire . . . it may happen tomorrow in garages, factories, filling stations, dry cleaning establishments, refineries, and many other buildings whose owners believe they have every possible protection against every hazard—and haven't!



Operation of Interceptor

In the interceptor, the incoming drainage is directed against a series of baffles which separate the oil, gasoline, naphtha, etc., from the drainage passing through. These intercepted liquids do not remain in the interceptor but are immediately discharged through the automatic gravity flow oil draw-off, to a container or storage tank. The draw-off, by reason of its design, can be set for each individual installation. The setting or adjusting depends upon various conditions of the particular installation, such as the size of the interceptor and the amount of drainage passing through in a given period. The container or storage tank placed somewhere in the vicinity of the interceptor receives the accumulating oils and other liquids safely, for the reason that the discharge of the accumulating oils and other liquids has been automatic.

A special feature of the Josam Oil Interceptor is the removable sediment container which retains all heavier than water solids removed from the drainage during the intercepting process. Disposal of sediment is easily accomplished by simply lifting off the interceptor cover and taking out the container.



Eliminates All Inflammable Solids and Liquids

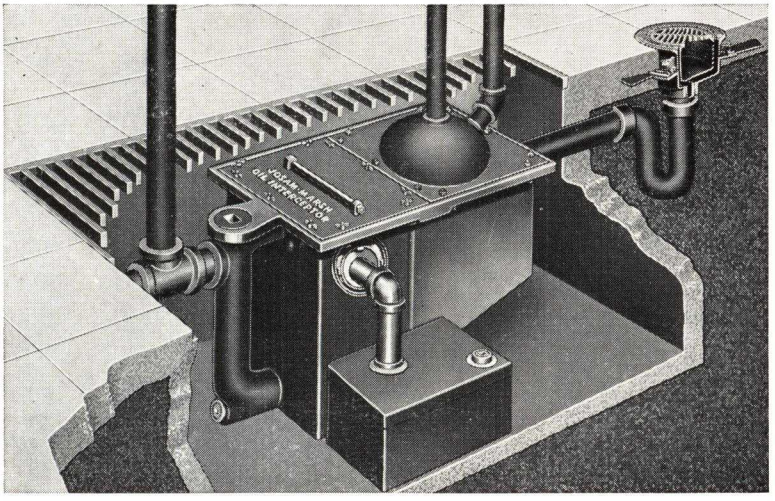
The slanting floor of the interceptor, combined with the three baffles within, and the shape and angle of the channel function jointly to effect elimination of all inflammable solids and liquids. There is no possibility of evaporation, since the seal is of sufficient depth to absolutely prevent it. The gravity draw-off is most efficient . . . it continues to discharge all oil, gasoline, naphtha, etc., regardless of how small an amount enters the interceptor. Oil positively cannot be discharged through the interceptor outlet . . . it must be discharged through the automatic draw-off . . . even if oil, gasoline and other inflammables enter without water!

The principle of the Josam Oil Interceptor permits its location at any point or distance below the floor or at any point below the entry of the drainage passing through it. Adaptable to practically any location in the drainage system where they can most adequately protect your property. A range of sizes is available to take care of any requirement.

Type	Dimensions in inches							Weight, lbs.
	A Inlet and outlet	B Seal	C Cleanout	D	E Width	F Length	G Height	
B-42	2	9½	4	14	18	32	21	185
B-43	3	9½	4	14	18	32	21	185
B-44	4	9½	4	14	18	32	21	185
B-64	4	14½	6	21	24	42	30	325
B-65	5	14½	6	21	24	42	30	325
B-66	6	14½	6	21	24	42	30	325

General Construction

The Josam Oil Interceptor is made of heavy cast iron in various sizes to meet the needs of any type of building. Its scientific design and construction effects separation of practically all of the oil, gasoline, naphtha, etc., from drainage passing through drain pipes.



Above illustration shows Oil Interceptor located in pit in basement of large garage, taking the drainage from all drains throughout the building and intercepting oil and discharging it to container adjacent and passing clear water through to sewer.

See preceding page for oil intercepting drains

Josam PRODUCTS

GENERAL APPLICATIONS

•

Kitchen Sinks
Diet Sinks

Electric Dishwashers

Combination Dish and Pot Sinks

Stock Kettles

in

Residences
Restaurants
Apartments
Hospitals
Clubs
Schools
Hotels
Institutions
Packing Plants
Abbatoirs

•

See the Following Pages for Other Types of Interceptors

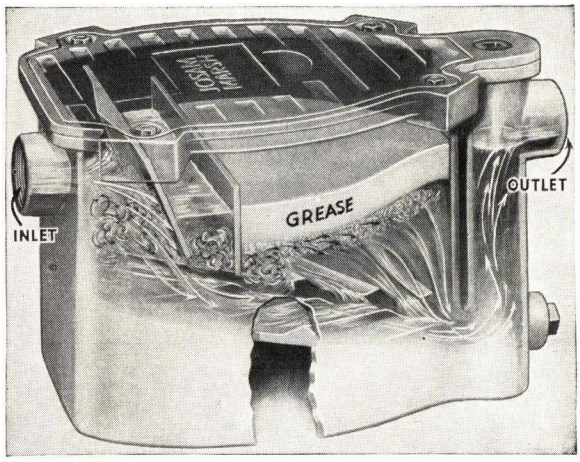
JOSAM GREASE INTERCEPTORS

A Type and Size For Every Requirement

Intercepts 90% or More Grease from Waste Water

Evacuates Solids

Prevents Foul Odors



Not Water Cooled

Easily Cleaned

Portable

JOSAM GREASE INTERCEPTORS INTERCEPT AND RETAIN GREASE, OIL AND FAT, PREVENTING THEM FROM ENTERING WASTE PIPES

Drainage facilities of industrial plants, hotels, apartments, restaurants, homes and other locations often become suddenly inactive until the source of trouble can be located. Often, such stoppage in drain pipes is difficult to find . . . expensive labor may be wasted seeking the location of the trouble . . . resulting in torn-up floors, escape of obnoxious sewer gas into homes or places of business, shut-down machinery . . . a costly waste of time and money.

The remedy is simple! An installation of a Josam Grease Interceptor which intercepts and retains grease, fats and oils from waste water, will protect drainage systems from present and future hazards brought about by the coagulation of these substances in drain pipes.

Josam Grease Interceptors are not water-cooled . . . solids are automatically evacuated . . . fermentation and decomposition are entirely eliminated, thereby leaving clean, odorless grease in the interceptor.

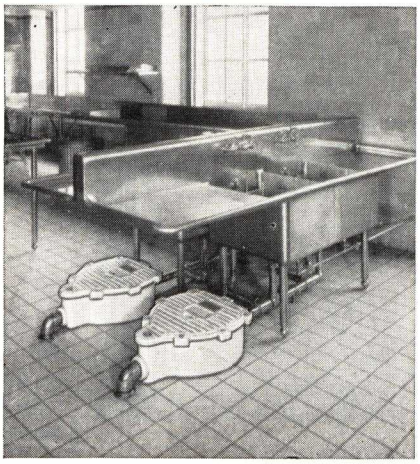
JOSAM GREASE INTERCEPTORS PROVIDE A POSITIVE MEANS FOR REMOVING GREASE, FAT AND OIL FROM ALL TYPES OF DRAINAGE SYSTEMS

Tests by plumbing inspectors and health officials in many cities show separation and retention of over 90% of all grease, oils and fats passing through a Josam Grease Interceptor, regardless of water temperature.

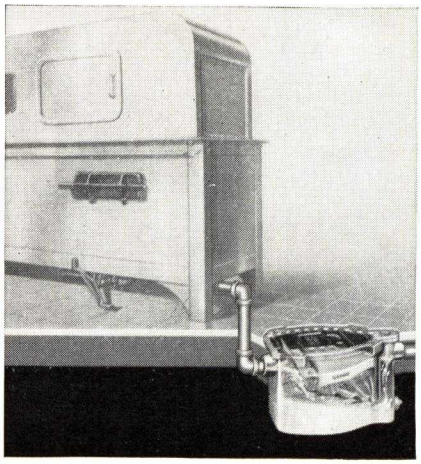
As there is no need of a cold water connection for chilling purposes, installation cost is very reasonable. A Josam Grease Interceptor can be applied at that point in the pipe line where it is needed . . . inlet and outlet are simply joined to pipe lines already existing . . . above, below, or on a level with the floor.

The Josam Grease Interceptor is sanitary because it automatically evacuates all solids and sediment, thereby preventing the occurrence of foul odors. By simply raising the cover, which is gasket tight as a safeguard against leakage, the grease chamber is entirely exposed for easy cleaning.

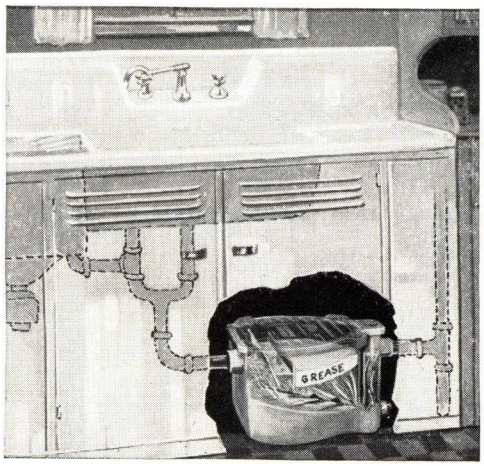
Positive in action . . . positive in results obtained . . . the Josam Interceptor, by every test, is the only interceptor whose patented scientific construction obtains results with the efficiency necessary to merit your every consideration.



Built-in-the-Floor Installation for Deep Sinks



Flush Floor Installation for Electric Dishwasher



Kitchen Sink Installation

JOSAM GREASE INTERCEPTORS

Design: The shape, baffles, design of bottom and sides, gasketed cover and depth of seal . . . all these are essential to the efficient performance of a grease interceptor. In order to have the grease interceptor operate properly, the water contents for clarifying and the definite ratings must be maintained.

The full depth apron adds not only to the appearance of the interceptor, but affords greater ease in installation. Easier roughing-in dimensions are maintained, and the tiling around the interceptor (when it has been placed below the floor level) is accomplished with less effort and the result is a more workman-like installation. See table below for various sizes made with continuous apron.

Venting: The Josam Grease Interceptor, in order to retain its water seal and prevent syphonage, must be vented in the same way and with the same size vent as required by ordinance or otherwise, for the venting of traps in any locality.

General Construction: Heavy cast iron body, painted white enamel interior and exterior, painted white enamel gasket tight cover and baffles, threaded brass cleanout, inlet and outlet as shown in table, unless otherwise ordered.

Recommended Sizes:

Type A-0—For small kitchen sinks in residences and kitchenette apartments.

Type A-1—For kitchen sinks in residences, restaurants, apartments, diet sink in hospitals.

Type A-1B—For moderate size residence sinks, restaurants, hotels, electric dishwashers, diet sinks, small combination dish and pot sinks.

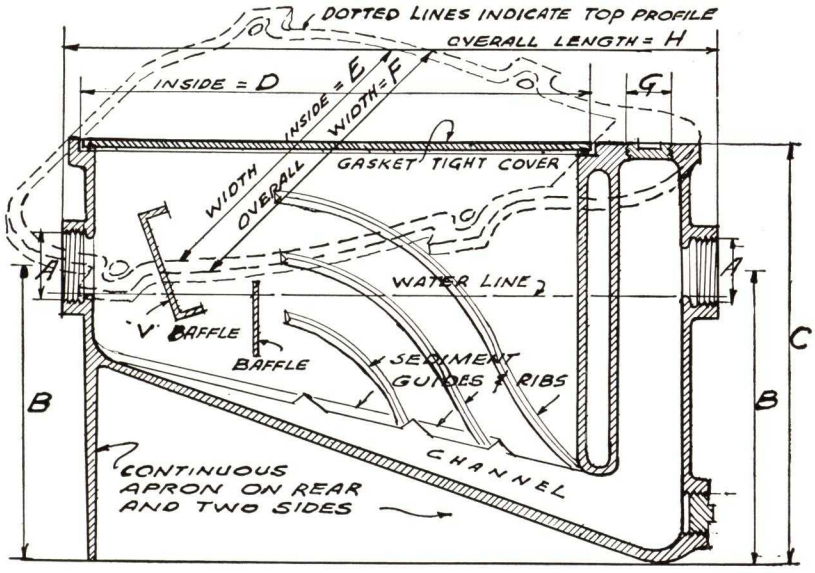
Type A-2—For large residence sinks, restaurants, hotels, electric dishwashers, small combination dish and pot sinks.

Type A-3—For restaurants, electric dishwashers and large pot sinks.

Type A-5 and Type A-15—For large dishwashers, restaurants, batteries of two to four slop or pot sinks, combination of dishwashers, pot sinks and stock kettles, when outlet runs to central point.

Type A-25 and Type A-50—For entire kitchen in hotels, hospitals, and large restaurants where one large interceptor is to be used at a centralized point.

Type A-75 and Type A-150—For specialized industries where exceptionally large capacities are required.



Size		Flow gallons per hour	Dimensions in inches								Weight, lbs.	Pipe Connection
Visible double wall seal	Internal seal		A	B	C	D	E	F	G	H		
WITH APRON SUPPORT												
A-0	.....	250	1½–2	7¾	10½	13¼	9⅜	11¼	1	16¼	52	Tap
A-1	A-1½	700	2	9¾	12¼	16½	11¾	13½	1¼	19¾	72	Tap
A-1B	.....	900	2	12½	16¾	18½	13½	15½	1½	24½	135	Tap
A-2	A-2½	1,200	2–3	12¼	19	22	16	18¼	1½	27	185	Tap
A-3	A-3½	1,500	3–4	18½	23½	27¼	19¼	21¾	2	32½	360	Tap
A-5	A-5½	2,500	4–5	20½	27¾	29⅞	22⅜	25¼	2	38¼	539	Tap
WITH LEG SUPPORT												
.....	A-15½	3,500	4–5	24½	33½	37	27½	29½	2	46½	710	Tap
.....	A-25½	4,000	6	23	32¾	42¼	30¼	32¾	2½	57¼	825	Caulk
.....	A-50½	9,000	7	30½	40	45⅝	39⅞	41⅞	3	55⅜	1,650	Caulk
.....	A-75½	15,000	7	36	48	69½	52	54	3	84½	3,500	Sewer pipe
.....	A-150½	30,000	8	42½	54½	102⁹⁄₁₆	71	73	10	110⁹⁄₁₆	6,500	Flanged

See the Following Pages for Other Types of Interceptors

Josam PRODUCTS

GENERAL APPLICATIONS

•

Plaster Sinks

Dental and Surgical Sinks

Operating Room Sinks

Lavatories

in

Hospitals

Beauty Parlors

Barber Shops

Laboratories

Dental Offices

Residences

Hotels

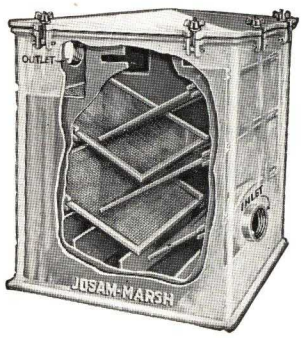
JOSAM INTERCEPTORS

For Hospital Plaster Sinks
TYPE C-1

For the removal from waste water of all Plaster of Paris, either solid or in a state of suspension, cotton, lint, hair or any other foreign matter which waste water may contain.

The water enters through the inlet pipe, is baffled and carried over the vertical plates and then passes through the fine mesh screens where the process of filtration takes place.

The Interceptor is absolutely non-siphoning and easily accessible for cleaning, as the cage and screens can be readily taken out by simply removing gasket tight cover.



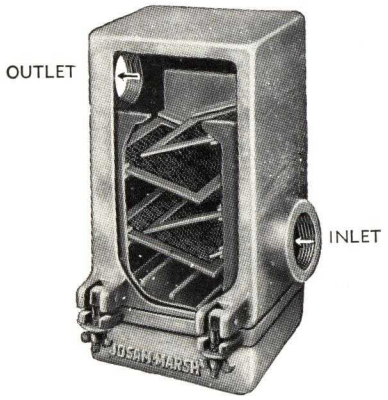
General Construction

Heavy grey cast iron body with white porcelain enamel exterior, chromium plated clamps, cage is heavy galvanized material, brass screens, female threaded inlet and outlet. Seal 7½ in.

Type	Dimensions in inches				Weight, lbs.
	Inlet	Outlet	Top	Height	
C-1	2	2	14x14	16	240

For Dental and Surgical Sinks
TYPE C-2

For use in connection with Dental, Surgical and Operating Room Sinks, Barber Shops and Beauty Parlor Sinks, for the removal from waste water of all solids, plaster, metals, cotton, lint, hair, etc. Cage is easily removed for cleaning. Interceptor is absolutely non-siphoning.



General Construction

Polished aluminum body, aluminum cage, brass screens, female threaded inlet and outlet. Seal 3½ in.

Type	Dimensions in inches				Weight, lbs.
	Inlet	Outlet	Top	Height	
C-2	1½	1½	5x5	10½	8

JOSAM SEDIMENT AND HAIR INTERCEPTORS

For use in connection with lavatories in barber shops, beauty parlors, residences, hotels, hospitals, and wherever waste waters contain hair and foreign matter which should be prevented from entering waste lines. Removable plug on bottom permits ready access to brass filter screen. Absolutely non-siphoning.

With Visible Double Wall Seal
TYPE D-4

With Visible Double Wall Seal and Swing Outlet
TYPE D-5

Types D-4 and D-5 permitted in all localities.

With Internal Wall Seal
TYPE D-3

Type D-3 permitted in certain localities.

General Construction

Type D-4 and D-3—Cast brass nickel plated body, brass removable screen and cleanout plug, 2 in. seal, female threaded outlet, inlet tapped for 1¼ in. O.D. brass tubing. Inlet also furnished for 1½ in. tubing, when so specified.

Type D-5—Identical except 7 in. seal and 1½ in. top swing joint outlet connection with ground joint fitting, permitting direct connection to waste liine without bends or fittings.

Type	Dimensions in inches				Weight, lbs.
	Inlet	Outlet	Top dia.	Height	
D-4	1¼	1½	3¾	6½	6
D-4A	1½	1½	3¾	6½	6
D-5	1¼	1½	3¾	10	7½
D-5A	1½	1½	3¾	10	7½
D-3	1¼	1½	3¾	6½	6
D-3A	1½	1½	3¾	6½	6

See the Preceding pages for other types of Interceptors

JOSAM CAS-CADE GREASE INTERCEPTOR

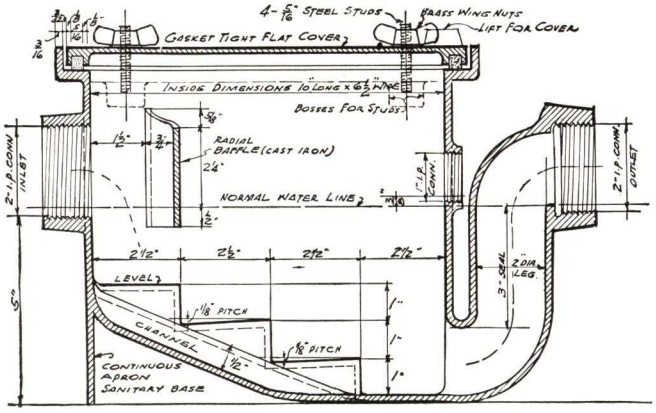
Intercepts Grease — Evacuates Solids

An Efficient Grease Interceptor—Not Water-Cooled

JOSAM SERIES J-10

The Josam Cas-cade Grease Interceptor meets the need for a Grease Interceptor for sinks in kitchens of dwellings, apartments and any other sinks where waste water contains grease and fat which should be prevented from entering waste lines. The Josam Cas-cade recovers practically all of the grease from waste waters and maintains a continuous evacuation of solids.

The principle of operation differs from the generally accepted designs in that the Josam Cas-cade Grease Interceptor has an entirely distinct method for the separation of grease from waste waters. All solids are evacuated with each discharge of greasy water through the interceptor, thus preventing fermentation, decomposition and foul odors in the interceptor.

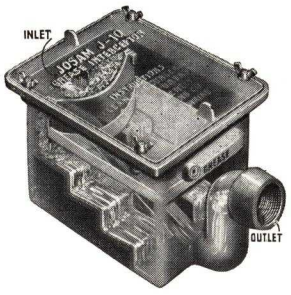


By simply removing the gasket-tight cover which is held firmly in place by four brass wing nuts on steel studs, the entire chamber is accessible for the removal of the grease.

The Josam Cas-cade Grease Interceptor has a full depth integrally cast apron support thereby eliminating fouling space at floor beneath interceptor. The white enamel interior and exterior adds to the appearance and harmonizes with practically all kitchen equipment.

General Construction

Heavy cast iron body, white enamel exterior and interior, gasket-tight cover and chromium plated wing nuts on steel studs, female threaded inlet and outlet.



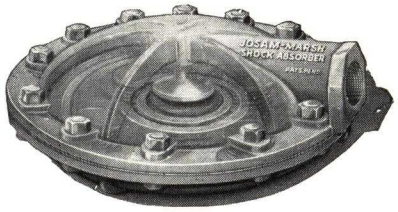
Type	Size, in.	Flow gallons per hour	Length, in.	Width, in.	Height, in.	Weight, lb.
J-10A	1½	300	15	12	10	40
J-10B	2	300	15	12	10	40

Also furnished in larger sizes to suit requirements.

JOSAM SHOCK ABSORBER

Subdues Water Hammer—Relieves Strain—Prevents Breaks—Not an Air Chamber

Josam Shock Absorbers quiet water hammer and absorb thrust and vibration in water supply lines. It will accomplish permanently, without recharging with air, rewashing, adjusting or servicing, all that several air chambers of any type will do, in addition to fulfilling its own duty of Pipe Insurance.



Description

The component parts of the Josam Shock Absorber indicate the completion of extensive research and practical tests which have revolutionized obsolete methods of trying to quiet water hammer and insure permanency of plumbing water supply systems. Regularly tested to stand water pressure at 125 lbs. Furnished for higher pressures when so specified.

Type	Size	Diameter
M- ½	½	7½
M- ¾	¾	7½
M-1	1	9
M-1½	1½	11½
M-2	2	14½

Recommended Uses

For quieting water hammer in pipe lines, relieving strain and preventing damage to piping systems by absorbing and dispelling shocks arising from quick closing valves—faucets—closet flush valves—house pumps and appliances—also for water pumping systems—sewage ejectors—closets in battery—water heaters—drinking fountains—self-closing hydrants—laundries—auto wash—overland oil lines—liquid pipe lines of any kind—automatic dish washers—swimming pool circulating pumps and concrete mixing machines.

See pages 22 and 23 for other types of Grease Interceptors

Josam PRODUCTS

GENERAL APPLICATIONS

•

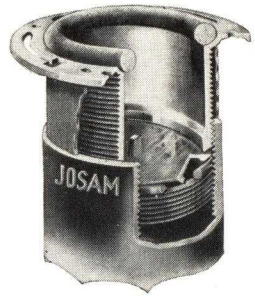
Water Closets
Pedestal Urinals
in
Schools
Hospitals
Public Buildings
Institutions
Prison Cells
Hotels
Clubs
Residences
Apartments

JOSAM ADJUSTABLE CLOSET OUTLET CONNECTIONS

Water-tight—Gas-tight—Adjustable—Permanent—Sanitary—Eliminate Plastic Joints

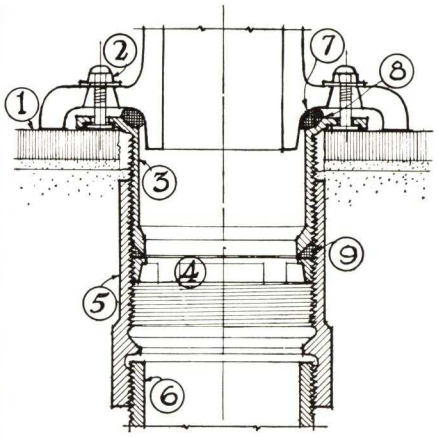
Josam Adjustable Closet Outlet Connections provide all necessary facilities for properly installing water closets and insuring a permanent, water-tight and gas-tight seal by means of approved asbestos gaskets, eliminating the use of plastic materials.

The detail below illustrates Josam Adjustable Closet Outlet Connection installed in floor construction and tightly sealed with fixture outlet by ½-in. asbestos gasket. The brass floor flange has been readjusted to the exact point permitting fixture to rest firmly upon floor when gasket is fully compressed, without strains on piping. Test plate has been removed and locking ring readjusted in position to fully compress the ¼-in. asbestos gasket and tightly seal the adjustable threaded joint. Can be sealed at any adjusted position.



FITS ALL MAKES OF WATER CLOSET BOWLS AND PEDESTAL URINALS WITH STANDARD FLOOR OUTLET

1. Floor construction bonded with connection
2. $\frac{5}{16}$-in. extra heavy brass bolts
3. Extra heavy brass floor flange. Adjustable, threaded. Permanent. Compensates for variations and irregularities in construction
4. Brass adjustable locking ring supports gasket and securely locks floor flange in any adjusted position. Readily adjusted by finger grips
5. Extra heavy cast iron japanned body same weight as extra heavy soil pipe



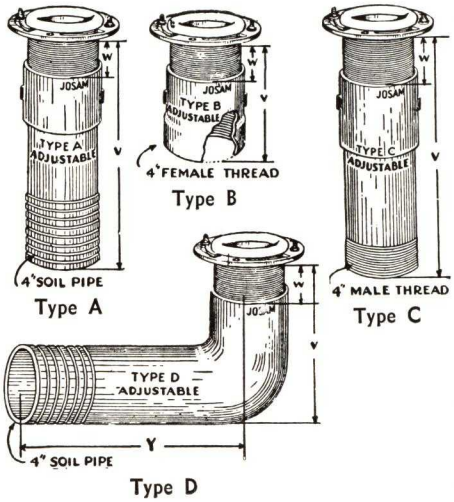
Type B

6. Waste pipe (not furnished)
7. ½-in. braided asbestos graphite gasket remains flexible and lasts indefinitely. Gas-tight and water-tight seal always maintained
8. Gasket fully supported by wide and deep seat
9. ¼-in. braided asbestos graphite gasket remains flexible and lasts indefinitely. Beveled seat expands gasket, tightly sealing adjustable threaded joint in any adjusted position. Seal withstands water test beforehand

Fixture may be readily removed and re-installed

ARCHITECTS AND ENGINEERS SUGGESTED SPECIFICATION

All Water Closets (and Pedestal Urinals) as shown on plans, shall be connected to and tightly sealed with waste piping by means of JOSAM ADJUSTABLE CLOSET OUTLET CONNECTIONS, complete as regularly furnished by manufacturer. Floor flanges and locking rings must be properly adjusted in position to provide water-tight and gas-tight seals both at fixture outlets and at adjustable threaded joints, by means of asbestos graphite gaskets, furnished by manufacturer. Sealing of such joints with putty or other plastic materials of any kind, will not be permitted. Fixtures must rest firmly upon floors without strain upon piping when gasket is fully compressed. Connections shall not be dismantled, or any parts thereof removed until fixtures are being installed.



Type	Dimensions in inches W Adjustment	V Min.	V Max.
A-12*	2	12	14
A-18*	2	18	20
A-24*	2	24	26
A-30*	2	30	32
A- 6	1	6	7
A- 6½	1½	6½	8
A- 7	2	7	9
B- 6	2	6	8
B- 5	1	5	6
B- 5½	1½	5½	7
C- 4½	1	4½	5½
C- 5	1½	5	6½
C- 5½	2	5½	7½

Type	Dimensions in inches W Adjustment	V Min.	V Max.	Y
C- 6½	3	6½	9½	.....
C- 8	3	8	11	.....
C-10*	3	10	13	.....
C-12*	3	12	15	.....
C-14*	3	14	17	.....
C-16*	3	16	19	.....
C-18*	3	18	21	.....
C-20*	3	20	23	.....
C-22*	3	22	25	.....
D-12x7½*	1½	7½	9	12
D-18x7½*	1½	7½	9	18
D-24x7½*	1½	7½	9	24
D-12x7*	1	7	8	12
D-18x7*	1	7	8	18
D-24x7*	1	7	8	24

*Indicates types furnished with side inlets or vents in 45° or 90° pattern, when so specified.

Inlets for Type D furnished on R.H., L.H., or R. and L. sides. Specify type, size, location and number of inlets.

General Construction

- Cast iron japanned body
- Genuine asbestos gaskets
- Metal top shield
- Adjustable brass floor flange
- $\frac{5}{16}$ in. extra heavy brass bolts
- Metal thread shield
- Adjustable brass locking ring
- Cast iron test plate
- Special or longer bodies, and side inlets or vents furnished when so specified.

Josam PRODUCTS

GENERAL APPLICATIONS

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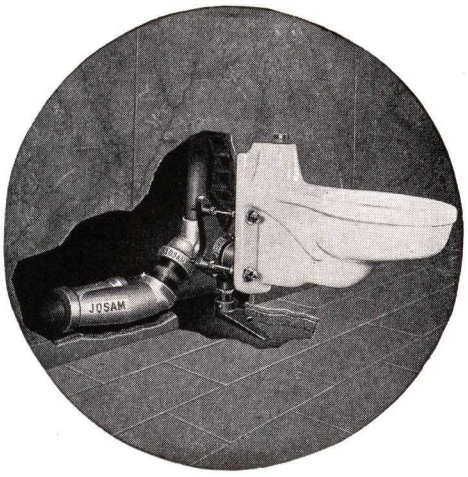
Wal-hung Syphon Jet or Blow-out Type Bowls and Wall Type Urinals

ADJUSTABLE WALL CLOSET SUPPORTS AND DRAINAGE FITTINGS



- **Practical and Flexible**
- **Eliminates Buried Piping, Pipe Tunnels, Dropped Ceilings**
- **Rigid Construction Assures Permanent Installation**

Provides vertical—front and back—and leveling adjustability.

All battery piping is installed above sub-floor, thereby dispensing with buried piping, horizontal pipe tunnels, or dropped ceilings below the battery of closets or urinals.

Piping system is simple and flexible. Separate drainage fittings for mains and branches, provide full latitude in locating piping.

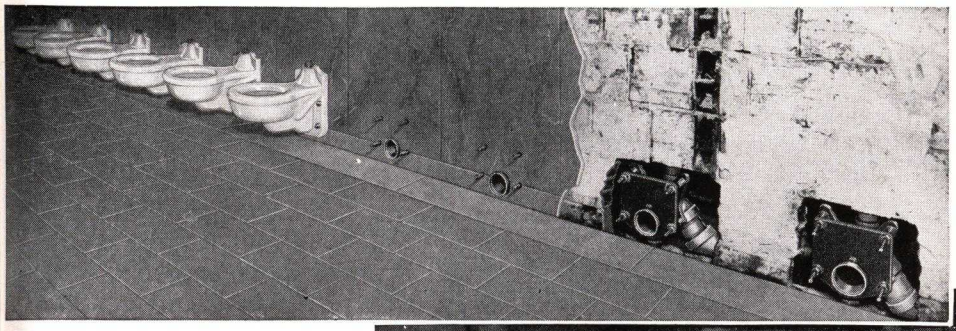
Balanced unit eliminates movement of piping, support or fixture and prevents breaking of joints or fixtures.

Fixture is solidly supported on adjustable yoke, independent of wall construction, and the adjustment permits leveling and accurate spacing of fixture.

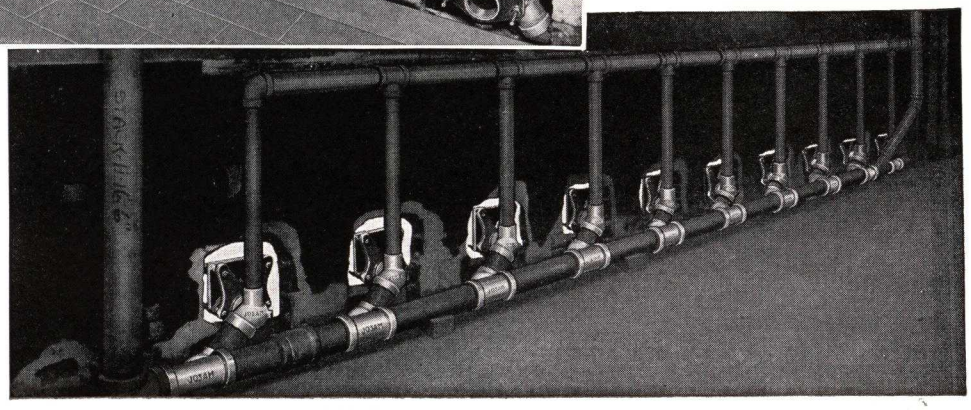
Eccentric sleeves and nipples provide leveling of fixture, proper centering of outlet and perfect alignment which eliminates any possibility of bind on pottery.

Josam Wall Closet Supports and Drainage Fittings are designed to accommodate any make of wall closet or wall urinal. They eliminate complications in building construction and simplify planning and installation of piping.

ARCHITECTS' SPECIFICATION: Furnish and install Josam Adjustable Wall Closet Supports and Drainage Fittings, complete with graphite gaskets and accessories, for wall-hung closets and urinals, to suit wall thickness and battery arrangement as shown on plans. The sealing of water closet trap outlets to soil pipe, with putty or other plastic compounds, will not be permitted.



Battery of Toilets showing fixtures in position.



Rear View of Above Battery, Indicating Simplicity of Piping Arrangement.

Check YOUR PLUMBING DRAINAGE REQUIREMENTS ON EACH JOB AGAINST THIS LIST OF JOSAM PRODUCTS, ESPECIALLY DEVISED TO PROVIDE PROTECTION TO BUILDINGS, PROPERTY, EQUIPMENT, AND PEOPLE, AND SPECIFY JOSAM PRODUCTS.

	Josam Floor Drains		Josam Plaster and Metal Interceptors
	Josam Roof Drains		Josam Sediment and Hair Interceptors
	Josam Shower Drains		Josam Shock Absorbers for Pipe Lines
	Josam Urinal Drains		Josam Open Seat Swing Check Valves
	Josam Sediment Basket Drains		Josam Open Seat Backwater Sewer Valves
	Josam Oil Retaining Drains		Josam Adjustable Closet Outlet Connections and Bends, Water and Gas-Tight
	Josam Swimming Pool Drains		Josam Cleanouts
	Josam Acid Resisting Drains		Josam Traps for Every Purpose
	Josam Highway Viaduct Drains		Josam Drains and Other Products Complying with U. S. Government Specifications
	Josam Non-Clog Triple Drainage Drains		Josam Expansion Joints
	Josam Swimming Pool Equipment		Josam Vent Stack Sleeves
	Josam Grease Interceptors		Josam Soil Pipe Connectors
	Josam Oil Interceptors		

Write for complete information and details on any of the above Josam Products.

JOSAM REPRESENTATIVES ARE LOCATED IN THESE CITIES:

Albany, N. Y.
Atlanta, Ga.
Baltimore, Md.
Birmingham, Ala.
Boston, Mass.
Buffalo, N. Y.
Chattanooga, Tenn.
Chicago, Ill.
Cincinnati, Ohio
Cleveland, Ohio
Dallas, Tex.
Denver, Colo.
Des Moines, Iowa
Detroit, Mich.
El Paso, Tex.
Grand Rapids, Mich.
Hartford, Conn.
Houston, Tex.
Kansas City, Mo.
Little Rock, Ark.
Los Angeles, Cal.
Miami, Fla.
Milwaukee, Wis.
Minneapolis, Minn.
Nashville, Tenn.
Newark, N. J.
New Orleans, La.
New York City, N. Y.
Oklahoma City, Okla.
Philadelphia, Pa.
Pittsburgh, Pa.
Richmond, Va.
St. Louis, Mo.
Salt Lake City, Utah
San Francisco, Cal.
Syracuse, N. Y.
Seattle, Wash.
Washington, D. C.

San Juan, P. R.

Buenos Aires, S. A.

West Coast Manufacturers and Distributors

JOSAM-PACIFIC COMPANY

765 Folsom St. San Francisco, Calif.
Branch—1340 E. 6th St. Los Angeles, Calif.

Canadian Manufacturers and Distributors

EMPIRE BRASS MFG. CO., LTD.

London, Ontario

JOSAM MANUFACTURING COMPANY

Main Sales and Engineering Office
EMPIRE BUILDING, CLEVELAND, OHIO

Factory and Foundry
MICHIGAN CITY, INDIANA

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THE R. C. MAHON COMPANY

Manufacturers of Cast Iron Roof Sumps

DETROIT, MICH.

REPRESENTATIVES IN ALL PRINCIPAL CITIES

Product

MAHON CAST IRON ROOF SUMPS.

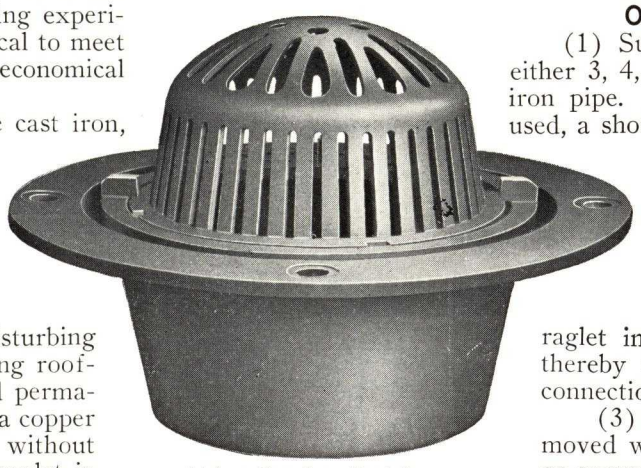
For Mahon Steel Roof Decks, Kalamein and Tin Clad Doors, and Rolling Steel Doors, see File Index.

Mahon Cast Iron Roof Sumps

The Mahon Cast Iron Roof Sump has been designed for absolute weathertightness, permanence, and greatest ease of installation. It is the result of many years of roofing experience, and is thoroughly practical to meet the need for a permanent, economical roof drain.

Manufactured in durable cast iron, the Mahon Sump is free from springs, bolts or loose rings and requires no elastic cement or solder for installation. The dome strainer locks in place by a simple turn and may be easily removed without disturbing either the sump or surrounding roofing. The sump bowl is fitted permanently into the roof deck and a copper apron, furnished with or without gravel stop, is calked into a raglet in the sump casting provided for the purpose. When used on gravel top roofs this gravel stop and the extremely narrow openings in the side of the dome strainer, provide a double protection for the drain.

Connection to conductor pipe is made by means of a threaded joint which is a standard pipe thread and makes a perfect watertight connection.



Mahon Cast Iron Roof Sump

Mahon Sumps never cause water to back up or lie on the roof —the strainer openings being equal to three times the area of the conductor pipe for which the sump is tapped.

Mahon Cast Iron Sumps may be furnished tapped to fit 3, 4, 5 or 6-in. standard wrought iron pipe thread. Quantity production on this product permits an unusually low price.

Outstanding Features

(1) Sump is available tapped to fit either 3, 4, 5 or 6-in. standard wrought iron pipe. If cast iron conductors are used, a short piece of wrought iron pipe is screwed into the sump and calked into the hub of the cast iron pipe.

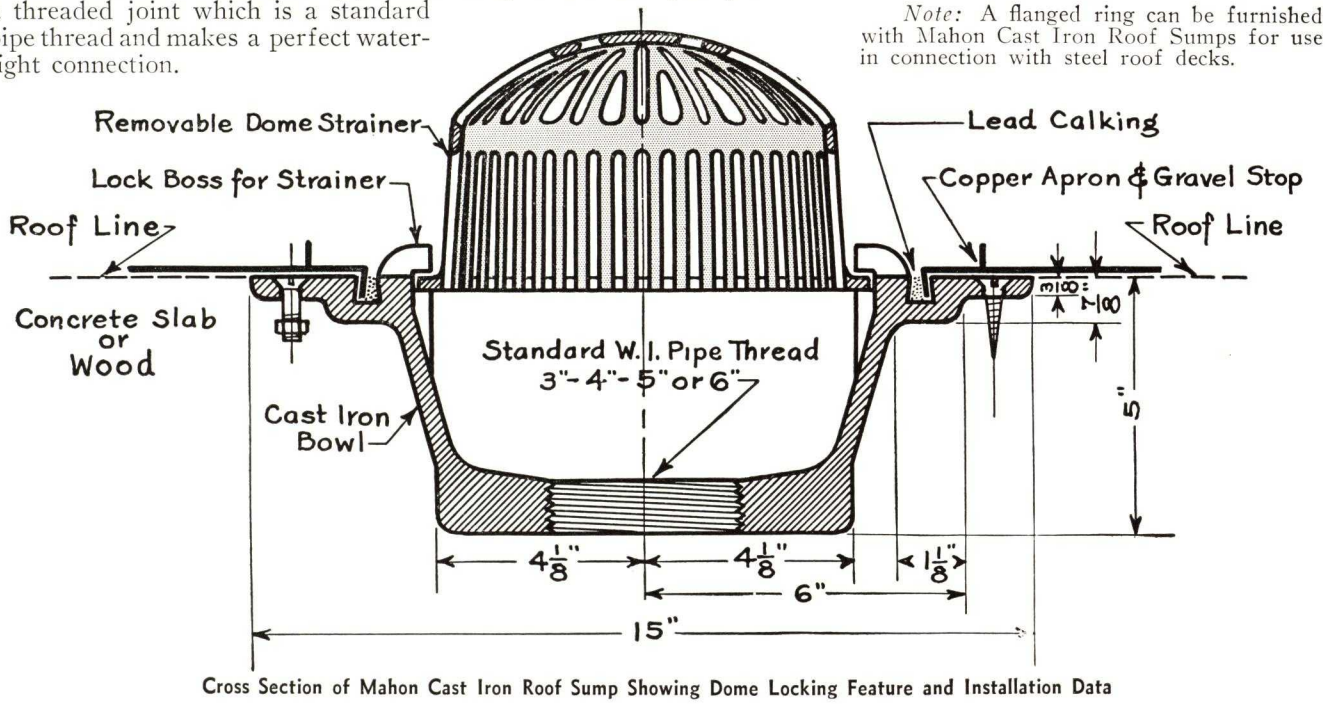
(2) A 16-oz. copper apron, with or without gravel stop, is furnished to be calked into a circular raglet in the sump bowl with lead, thereby making a perfect watertight connection with roofing material.

(3) Dome strainer may be removed without disturbing sump bowl or surrounding roofing.

A simple turn engages four cast iron lugs which lock the dome strainer securely in place.

(4) Openings in dome strainer are equal to three times the area of the conductor pipe, insuring full capacity of the drain at all times.

Note: A flanged ring can be furnished with Mahon Cast Iron Roof Sumps for use in connection with steel roof decks.



Cross Section of Mahon Cast Iron Roof Sump Showing Dome Locking Feature and Installation Data

MEMORANDA

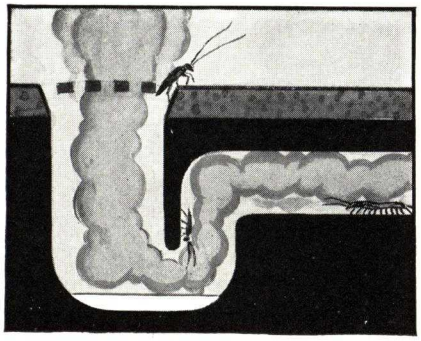
THE PHILLIPS CORPORATION

Manufacturers of the Phillips Automatic Trap Seal Valve

806 S. W. Broadway
PORTLAND, OREGON

Maintains Constant Water Seal in Drain Traps

The Phillips Automatic Trap Seal Valve scientifically eliminates the last hazard in modern plumbing. Without attention, it replenishes the water seal in the traps of floor drains and other little-used fixtures. Constant seals are necessary to prevent the entry into house and buildings of gases and disease-bearing vermin from the sewer.



Unsafe

Danger lurks here. The water seal in this basement drain trap has partially evaporated, leaving an open passageway into the house for sewer gases and vermin.

Safe

This trap is sealed. The Phillips Automatic Trap Seal Valve periodically replaces water that has evaporated. The water seal forms an impenetrable barrier. Gases and vermin cannot enter this house.

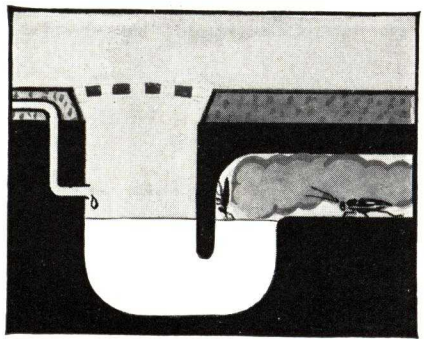
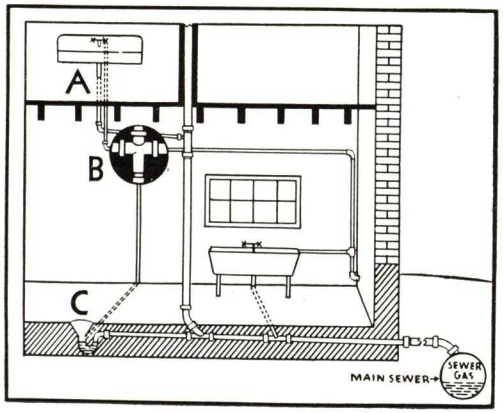
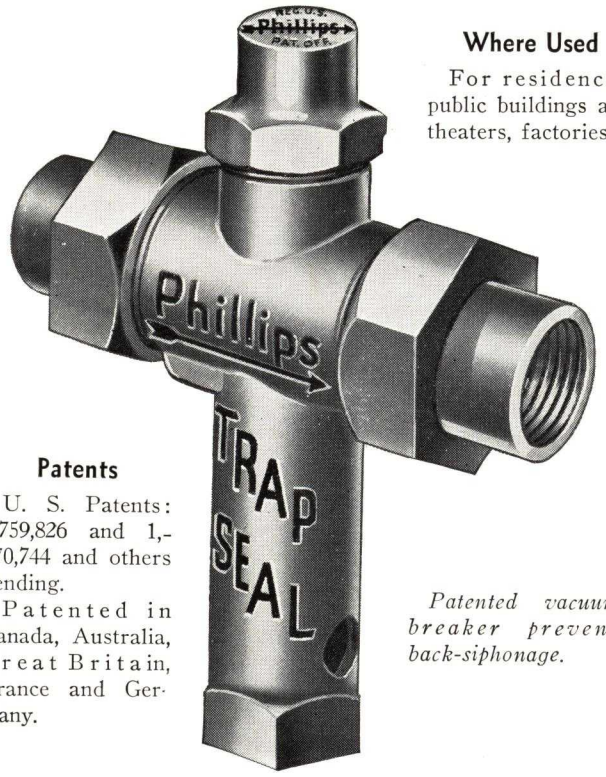


Diagram of Installation and Operation

The diagram shows how the Phillips Automatic Trap Seal Valve protects the occupants of the house. When water is drawn at a frequently-used fixture (see A), the water flowing through the Phillips Automatic Trap Seal (see B) forces up a piston. The piston opens a valve, which allows the required amount of water to flow into the drain trap (see C). When water is no longer drawn at the fixture, the piston closes the never-leak valve, stopping the flow of water into the trap.





Where Used

For residences, public buildings and theaters, factories.

Patents

U. S. Patents: 1,759,826 and 1,970,744 and others pending.

Patented in Canada, Australia, Great Britain, France and Germany.

Patented vacuum-breaker prevents back-siphonage.

Application

Wherever there are plumbing systems with infrequently-used drains or other fixtures.

Function

To maintain constant water seals in the traps of floor drains and other little-used fixtures.

Size

One size; ½-in. female unions on supply ends, ½-in. female tapping on outlet end; also avilable with ¾-in. male unions on supply ends.

Installation

Install in the cold water supply line running to a frequently-used fixture, such as a kitchen sink or toilet.

Details of Construction and Operation

The Phillips Automatic Trap Seal Valve has only one moving part, a piston. When water is drawn at the plumbing fixture in whose supply line the valve is installed, the flow of water forces up the piston. This action opens a small aperture through which a small amount of water flows into the pipe extending to a trap. The valve discharges approximately two thirds of a pint of water per minute of operation at 50 lbs. pressure.

The drain connection of the valve has an opening to the atmosphere. This eliminates a sealed connection between the supply line and drain, making back siphonage impossible.

The valve is made of cast brass. It is self-cleaning, and the valve seat fits tighter with wear. It cannot leak and will outlast the building in which it is installed.

Manufactured for the Phillips Corporation by the Chicago Faucet Co.

WADE IRON SANITARY MANUFACTURING CO.

230-240 North Jefferson Street
CHICAGO, ILLINOIS

ESTABLISHED 1865

Products

LOCK-OUT VALVES; BACKWATER VALVE FLOOR DRAINS; WATER JACKETED GREASE INTERCEPTORS; HOSPITAL and LABORATORY TRAPS; CAST IRON CATCH, GRAVEL, DRAINAGE, and SETTLING BASINS; TRIPLE GASOLINE and OIL SEPARATORS; STEAM BLOW-OFF BASINS; BILGE and EJECTOR SUMP BASINS; FLOOR DRAINS, INDUSTRIAL and PACKING HOUSE DRAINS; GARAGE DRAINS; BASEMENT DRAINS, etc. Roof Drains, Deck Drains, Street, Manhole, and Special Covers; Drainage Specialties.

Our complete catalogue will be sent on request.

Wade's Government Downspout Head

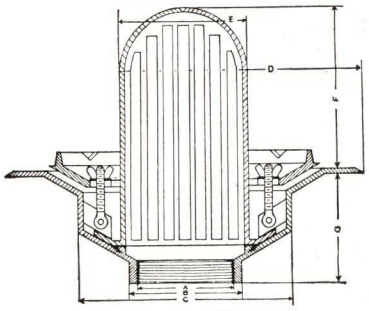


Fig. D-460

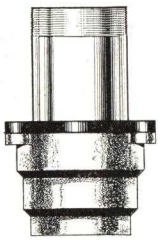


Fig. D-464

SIZES AND LIST PRICES

Sizes, in.	3	4	5	6
Downspout Heads—Fig. D-460				
List price Caulked	$12.00	12.00	14.00	16.00
List price Threaded	$14.00	14.00	16.00	18.00
Expansion Joint for Downspout Heads—Fig. D-464				
List price	$12.00	14.00	16.00	18.00

Wade "Accessible" Backwater Valves

Durable and dependable, this valve will give permanent flood protection. Exclusive WADE Flusher connection provides thorough cleaning with water under pressure. Adapted to receive any number of extensions to make sewer line accessible at any depth. Threaded brass clean-out furnished when specified, at added cost.

Fig. D-101

SIZES, WEIGHTS AND LIST PRICES

Size of valve, in.	Weight, lbs.	List price Fig. D-101	Size, valve, in.	Weight, lbs.	List price Fig. D-101
2	30	$13.00	9	135	$40.00
3	35	15.00	10	240	60.00
4	55	18.00	12	350	100.00
6	90	24.00	24	1450	400.00
8	125	36.00			

Wade "Accessible" Lock-Out Valve

Insures positive protection from backwater under all conditions. Equipped with automatic and manually operated valves. Flusher connection permits rapid cleansing of both valves. Adaptable for extensions to floor levels.

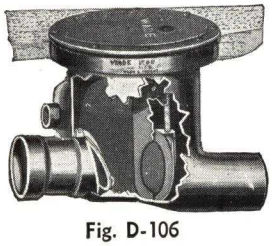


Fig. D-106

SIZES, WEIGHTS AND LIST PRICES

Size, in.	Weight, lbs.	List price
4	170	$75.00
6	195	80.00
8	350	130.00

Wade "Accessible" Floor Drain

With Backwater Valve

Recommended where trap is required in basements, etc. Furnished with various style strainer tops, and also without valve.

Price includes valve.

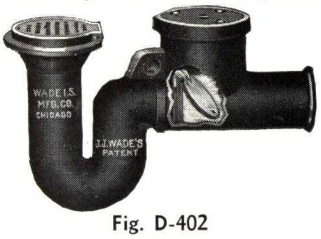


Fig. D-402

SIZES, WEIGHTS AND LIST PRICES

Size, in.	Weight, lbs.	List price
2	25	$14.00
4	90	26.50
6	125	38.00

Wade "Accessible" Floor Drain with Valve, Trap and Removable Bucket

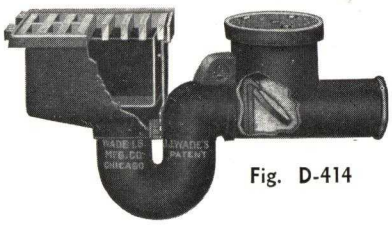


Fig. D-414

Similar to Fig. D-402. Furnished with removable dirt bucket, hinged square grate, and backwater valve.

Size, in.	Weight, lbs.	List price
4	170	$38.50
6	225	70.00

Wade "Accessible" Cast Iron Basins

Made in all possible sizes, and designed as interceptors of grease, gravel, oil, sediment, sand, and all wastes to prevent clogging of sewer lines. Furnished with or without trap, and with any number of hubs, and with all types of covers, bolted or open.

WADE cast iron sump basins are made in all sizes for every type of bilge and ejector pump. As each installation is different, it is impractical to show list prices but these will be furnished on request.

Fig. D-340 steam blow-off basin is made for use with boilers of any horsepower or pressure.

Fig. D-340

SIZES AND LIST PRICES

Size, in.	List price	Size, in.	List price	Size, in.	List price
16x20	$35.00	24x42	$ 89.00	36x72	$230.00
16x24	39.00	24x48	99.00	42x42	195.00
18x24	42.00	30x36	110.00	42x48	210.00
18x30	48.00	30x42	120.00	42x60	250.00
18x36	56.00	30x48	135.00	42x72	280.00
20x24	50.00	30x60	157.00	48x48	270.00
20x30	58.00	36x36	140.00	48x60	310.00
20x36	65.00	36x42	153.00	48x72	350.00
24x30	70.00	36x48	170.00	60x60	575.00
24x36	79.00	36x60	192.00	60x72	650.00

Wade "Accessible" Floor, Shower and Stall Drains

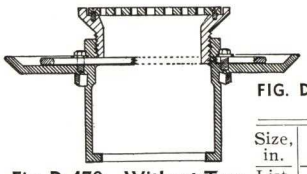


Fig. D-470—Without Trap

FIG. D-465—WITH TRAP

Size, in.	3	4
List price	$12.00	$16.00

FIG. D-470—WITHOUT TRAP

With or without Flashing Ring, with Chromium Plated Strainer, Caulking or Threaded Outlet.

Sizes, in.	1½	2	3
List price	$6.00	$6.00	$8.00

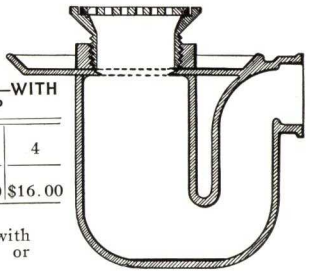


Fig. D-465—With Trap

Wade "Accessible" Water Cooled Grease Trap

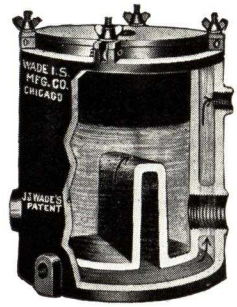


Fig. D-220

Separating grease from hot waste water by sudden chilling, the WADE Water Cooled Interceptor recovers more grease per gallon than other types. Cold water is constantly circulating around the entire interior, walls, bottom, and central partition, utilizing maximum cooling area. Water jacket is cast integral with the WADE Interceptor and must not be confused with small sectional jackets which occupy but fractional area of trap.

DIMENSIONS—INCHES

Size	A	B	C	D	E	F	G	H	I	J	K
Small—No. 1	15	9¼	2¾	10¼	10	13	2	¾	10	4½	2⅜
Government—No. 2	17	11¾	2¾	12¾	12½	16	2	¾	12	4½	2⅜
Large—No. 3	23	17	3	18	16	20	3-4	1¼	16	6½	3¼
Extra Large—No. 4	28	19½	3½	20½	20	25	3-4	1¼	18	6½	3¾

SPECIFICATIONS				LIST PRICE		
Size	Grease, lbs.	Gal. water per hour	Weight, lbs.	Enamel painted	Enameled in or out	Enameled in and out
Small—No. 1	25	75-100	135	$48.00	$60.00	$72.00
Gov't—No. 2	40	150-250	250	75.00	On Application	
Large—No. 3	80	250-350	560	140.00	On Application	
Ex. Large—No. 4	115	550-650	825	180.00	On Application	

Wade "Accessible" All-Purpose Interceptors

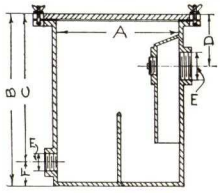


Fig. D-200

Recommended for all purposes where water cooled traps are not required. Larger sizes are inexpensive, efficient traps for general hospital use and as optical and dental laboratory interceptors.

All sizes fitted with central baffle plate. Cover easily removed for cleaning. Larger size made on order.

Size I.D.	A	B	C	Fig. 200 D	E	F	Wt., lbs.	Grease, lbs.	Gal. per hour	List price
6x10	6	10¾	8	3¾	1½	2¾	25	3	20-30	$12.00
8x10	8	10¾	8	3¾	1½	2¾	35	8	30-45	14.00
10x12	10	13	10	4¾	2	3	55	20	65-85	17.00
14x14	14	15	12	5	2	3	110	40	100-150	23.00
14x18	14	19	15	5	2-3	3½	125	60	150-250	30.00
18x18	18	22	18	8	3	3½	250	80	250-350	40.00

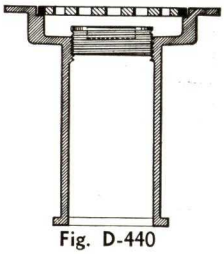


Fig. D-440

Wade "Accessible" Laundry Floor Drain for Use in Bungalows

Made with brass plug to eliminate the danger of back water. Plug may be removed when laundry is in use.

Made in one size only.

2-in. drain—4-in. strainer

List price $3.00

Wade "Accessible" Balcony or Canopy Cornice Drain

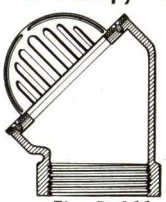


Fig. D-466

Made with brass strainer.

List price japanned: 2-in., $7.00; 3-in., $8.00.

Wade "Accessible" Solid Brass Bell Traps

Fig. D-468 —6 x 6 in., $5.50; 9x9 in., $10.00.

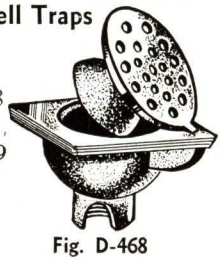


Fig. D-468

Wade "Accessible" Floor Drains

Recommended for all industrial purposes in dairies, breweries, factories, etc. Heavy grate will support trucking. Secondary strainer prevents sewer stoppage. Not furnished with clamp ring unless so ordered. Drain also made with inside caulking connection.

A	B	C	D	E	F	Wt.	List price
2	17¼	10	6	2	4	53	$14.50
3	17¼	10	6	2	4	53	14.50
4	17¼	10	6	2	4	53	14.50
4	21	14	6	2	4	78	23.00
5	21	14	6	2	4	78	24.00
6	21	14	6	2	4	78	25.00
8	21	14	6½	2	4½	85	28.00

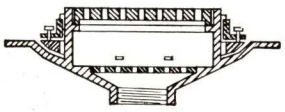


Fig. D-435

Fig. D-435—For any kind of floor where there is no heavy trucking.

Fig. D-437—Heavy Grate. For any kind of floor, also where there is heavy trucking.

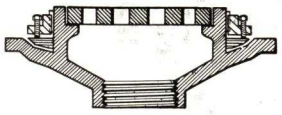


Fig. D-437

WITH OR WITHOUT FLASHING RING			
Size, in.	2	3	4
Weight, lbs.	45	45	45
List price	$14.00	$14.00	$14.00

FIG. D-417—SHALLOW BUCKET FLOOR DRAIN

Size, in.	2	3	4
Square Type—9 x 9 In.			
Weight, lbs.	27	27	27
List price	$12.00	12.00	12.00
Square Type—12 x 12 In.			
Weight, lbs.	70	70	70
List price	$16.00	16.00	16.00

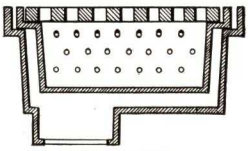


Fig. D-417

Wade "Accessible" Deep Bucket Floor Drain Basins

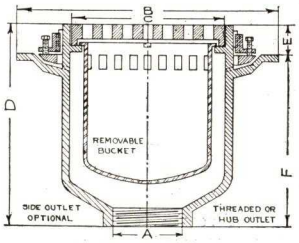


Fig. D-381

This drain is fitted with removable sediment bucket for use in plants where refuse is washed into sewer. Side outlet is optional.

A	B	C	D	E	F	Wt.	List price
2	17¼	10	13	2	11	70	$21.50
3	17¼	10	13	2	11	70	21.50
4	17¼	10	13	2	11	70	21.50

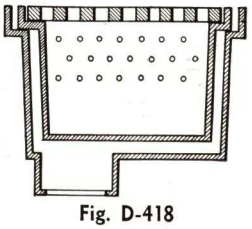


Fig. D-418

Fig. D-418—Deep Bucket—Square Type Floor Drain.

Size, in.	2	3	4
Weight, lbs.	80	80	80
List price	$19.00	19.00	19.00

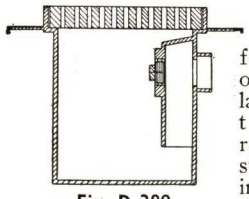


Fig. D-380

Recommended for all types of floors in laundries, factories, garages, service stations, packing plants, industrial plants, etc., wherever wastes accumulate upon floors to be washed into sewers.

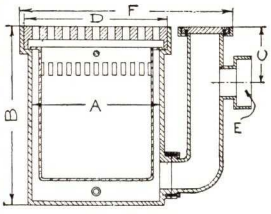


Fig. D-388

Drains priced without removable buckets. *Add to list as shown if bucket is required.*

Size I. D.	A	B	Fig. 380 C	Fig. 388 C	D	E	Fig. 380 F	Fig. 388 F	Fig. 388 Wt., lbs.	Fig. 380 List price	Fig. 388 list price	Add for bucket
6x10	6	12	4½	3½	6	2	11	13	75	$14.00	$17.00	$ 4.00
8x10	8	12	5	3½	8	2	13	14½	90	16.00	19.00	6.00
10x12	10	14½	6	4	10	3	16	18½	125	19.00	23.00	8.00
14x14	14	15½	6¾	5	14	3	19	23	210	22.00	27.00	12.00
14x17	14	19½	7¼	5½	14	4	19	23	250	24.50	32.50	12.00
18x18	18	21	10	5½	18	6	22	28	360	34.00	44.00	16.00

J. A. ZURN MFG. CO.

Plumbing Drainage for All Building Requirements

ERIE, PA.

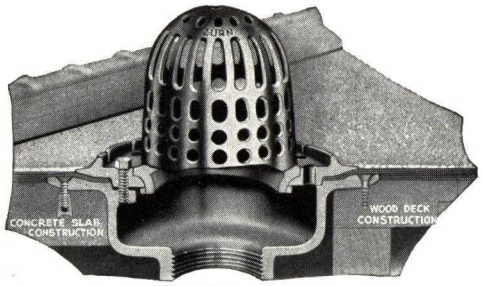
SALES OFFICES IN ALL PRINCIPAL CITIES

ROOF DRAINS

Fig. Z-100

Function—Normal water flow is through roof level inlets in gravel guard, representing primary drainage. When water flow exceeds capacity of these inlets, it rises to auxiliary drainage in dome which is designed for ample inlet capacity over outlet.

Clamping Device—Four heavy brass bolts secure directly to drain body. Clamping surfaces broad and plane, eliminating bending and cracking of roof felts. Integral gravel guard and primary drainage form part of clamping collar.



Installation Detail

Dome at roof level eliminates dirt accumulation and clogging. Drain Dome is held firm and secure with a bayonet type locking device which permits easy removal and replacement. Excess inlets provide for rapid drainage when water flow exceeds capacity of roof level inlet.

Dome—Dome held firm with bayonet type locking device—easily removable for cleaning. Ample inlet area eliminating clogging.

Roof Fastening—Simple and secure by means of countersunk holes in drain body to provide anchorage to roof construction. All screws or bolts beneath flashing.

Tar Exclusion—By cutting felts to butt edge of drain and securing top plies only, under clamping collar, movement of tar into drain is virtually eliminated.

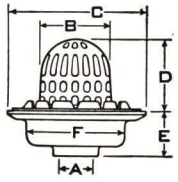


Fig. Z-100

Z-100 Roof Drain

Zurn Z-100 Roof Drain is recommended for flat roofs and gutters of wood, cement, steel, pre-cast slab and other composition.

Supplied in Dura-coated cast iron, galvanized or bronze bodies, domes and clamping collars, heavy brass clamping bolts, threaded or caulk outlets.

DIMENSION CHART							LIST PRICES		
A Pipe size	B in.	C in.	D in.	E in.	F in.	Wt. lbs.	Coated (DC)	Galv. (G)	All bronze (BR)
2-3-4	8	16	8	5¼	11½	40	$16.00	$21.50	$40.00
5	8	16	8	5¼	11½	42	19.50	25.00	49.00
6	8	16	8	5¼	11½	48	21.50	27.00	54.00
8	8	16	8	5¼	11½	54	30.00	39.50	71.50

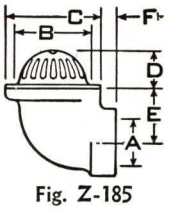


Fig. Z-185

Z-185 Cornice Drain

Zurn Cornice Drain, Z-185, is recommended for cornices, balconies, porches, window sills and other roof locations where conditions require positive seepage control. This type drain is furnished in Dura-coated iron galvanized or bronze bodies, dome strainers; clamping collors of polished bronze; outlets threaded.

DIMENSION CHART							LIST PRICES		
A Pipe size	B in.	C in.	D in.	E in.	F in.	Wt. lbs.	Coated (DC)	Galv. (G)	All bronze (BR)
2	3⅜	4½	1½	2½	½	5	$ 6.00	$ 7.00	$ 8.00
3	4¾	6	2	3	½	7½	7.50	9.00	11.00
4	4¾	6	2	3	½	9	9.00	11.00	13.00

Z-150 Roof and Deck Drain

This drain can be used with any type of flat roof or deck wherein foot traffic would make use of dome type strainer impractical. Supplied in Dura-coated cast iron, galvanized or bronze bodies, frames and clamping collars, with heavy brass clamping bolts, threaded or caulk outlets.

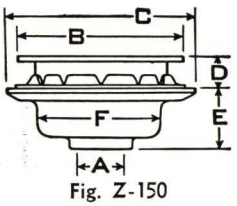


Fig. Z-150

DIMENSION CHART							LIST PRICES				
										W/bronze frame and strainer	
A-pipe size	B in.	C in.	D in.	E in.	F in.	Wt. lbs.	Coated (DC)	Galv. (G)	All bronze (BR)	Coated (CB)	Galv. (GB)
2-3-4	13¼	16	2	5¼	11½	49	$20.00	$26.00	$43.00	$31.50	$37.50
5	13¼	16	2	5¼	11½	51	24.50	31.10	52.50	39.00	45.60
6	13¼	16	2	5¼	11½	55	27.00	35.00	61.00	45.50	53.50
8	13¼	16	2	5¼	11½	60	36.00	45.50	73.50	55.00	64.50

Z-190 Vertical Expansion Joint

Zurn Vertical Expansion Joint provides for expansion and contraction wherever necessary in roof drain construction. It is supplied with Dura-coated cast iron bodies and wedged collars, heavy cast bronze sleeves with finished surfaces, graphited asbestos packing rings, and heavy steel bolts, with brass wing nuts. The outlet is shown threaded but can be furnished either spigot or hub when specified.

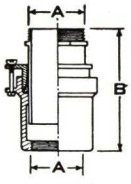
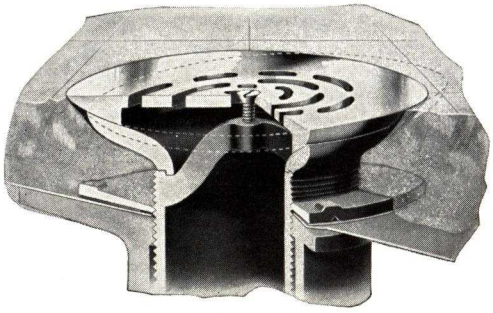


Fig. Z-190

DIMENSION CHART				LIST PRICES		
	B—Inches					
A Pipe size	Min.	Max.	Wt. lbs.	Coated (DC)	Galv. (G)	All bronze (BR)
2	7½	12	8	$ 5.50	$ 6.50	$ 9.00
3	7½	12	11	7.00	8.50	12.00
4	7½	12	13	8.00	10.00	14.00
5	7½	12	17	11.00	13.50	18.00
6	7½	12	18	13.00	16.00	22.00
8	7½	12	30	21.00	26.00	36.00

FLOOR OR SHOWER DRAINS

Heavy cast bronze strainer adjustable to plane of floor by loosening the securing screw which operates in slotted opening in the strainer. This desirable design definitely eliminates danger of cut feet and infection caused by projecting drain edges.



Installation Detail

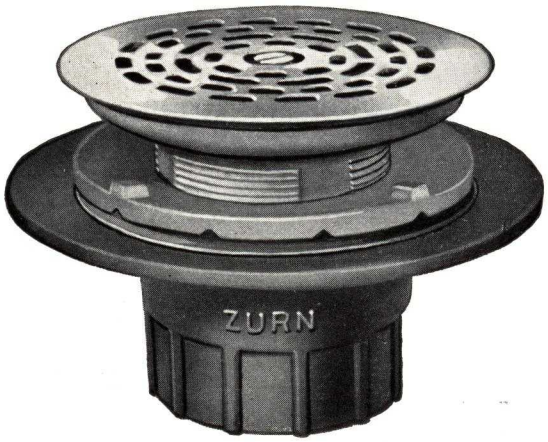


Fig. Z-200

The most striking of several important designed features of Zurn Floor or Shower Drains is the ability of the strainer to be adjusted to the plane of the floor. This is a typical example of the continual thought Zurn is giving to improving plumbing systems.

Wherever Zurn Floor or Shower Drains are installed this designed feature definitely eliminates the danger of accidents and breakage. Strainer is attached by a single screw at the center and is inserted through a slotted opening in the strainer, permitting strainer to be tilted and locked out of perpendicular if necessary to accommodate floor plane.

Seepage Control—Seepage around edge of strainer is prevented by applying sealing compound under strainer edge which is designed to compensate for cement floor shrinkage. Tightening of strainer screw compresses compound. A watertight installation is always assured. Adjustable sleeve for variable floor thicknesses is another practical Zurn feature. Seepage pan design permits metal flashing to fit without shaping. Clamping collar combined with copper friction ring and adjustable screw sleeve, with raised lugs, provide means to forcibly drive collar to assure a joint that absolutely is watertight. Seepage flows through horizontal slots in clamping collar and through vertical seepage channels in adjustable sleeve. A tubular fiber shield prevents clogging of channels when cement is poured.

Testing Provisions—Body threads are standard pipe size, enabling standard iron pipe plug or nipple with cap to be inserted for testing.

Catalog—Catalog describes Zurn Drains—Floor or Shower Drains—in greater detail and includes cross sectional blueprint drawings showing every advantageous feature. It will be sent upon request.

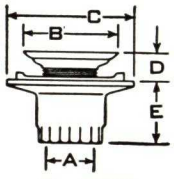


Fig. Z-200

Z-200 Drain

This drain is recommended for shower rooms and stalls in toilet rooms and floor areas of concrete, tile, terrazzo, or other composition, where seepage control is required. This unit is supplied with heavy bronze plated strainer, extra heavy Dura-coated cast iron, galvanized or bronze bodies, angularly and vertically adjustable strainer with clamping collar and threaded outlets. (Z-210 caulk outlet.)

DIMENSION CHART						LIST PRICES			
A-pipe size	B-str. diam.	C inches	D inches	E inches	Wt. lbs.	Coated (DC)	Galv. (G)	All bronze (BR)	Chrome str.
1½-2	4	7	1-2	3½	9½	$7.50	$9.00	$13.50	+$.60
	*5	7	1-2	3½	10	8.50	10.00	14.50	.80
3	5	9	1-2	4	15	10.00	12.00	17.50	.80
	*6	9	1-2	4	15½	11.50	13.50	19.00	1.00
	7	9	1-2	4	16	13.00	15.00	20.50	1.50
4	5	9	1-2	4	16½	11.00	13.50	19.00	.80
	6	9	1-2	4	17	12.50	15.00	20.50	1.00
	*7	9	1-2	4	17½	14.00	16.50	22.00	1.50
Deduct for clamping collar						1.00	1.50	2.50	.....

Z-250 Combined Drain and Trap

This drain is suitable for any type of floor area of concrete, tile, terrazzo, or other composition and combines integral trap. Heavy bronze strainers adjustable to floor level (angular and vertical), heavy Dura-coated cast iron, galvanized or bronze bodies, with clamping collar, outlets for threaded pipe or caulk connection.

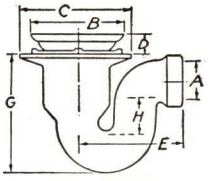


Fig. Z-250

DIMENSION CHART									LIST PRICES		
A-pipe size	B-str. diam.	C in.	D in.	E in.	F in.	G in.	H in.	Wt. lbs.	Coated (DC)	Galv. (G)	All bronze (BR)
1½-2	4	7	1-2	6	9	6¾	2	15	$13.00	$16.50	$24.50
	*5	7	1-2	6	9	6¾	2	15½	14.00	17.50	25.50
3	5	9	1-2	8	11	9	2	26	18.00	21.50	34.50
	*6	9	1-2	8	11	9	2	26½	19.50	23.00	36.00
	7	9	1-2	8	11	9	2	27	21.00	24.50	37.50
4	5	9	1-2	8	11	9	2	28	22.50	27.60	41.00
	6	9	1-2	8	11	9	2	28½	24.00	29.10	42.50
	*7	9	1-2	8	11	9	2	29	25.50	30.60	44.00
Deduct for clamping collar									1.00	1.50	2.50

(*) Denotes recommended stainer size having proper drainage capacity for size of outlet.

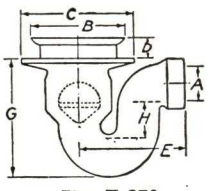


Fig. Z-270

Z-270 Floor Drain with Backwater Valve

Recommended for any installation where backwater pressure may be encountered. Furnished with heavy Dura-coated cast iron, galvanized, or bronze bodies. Bronze strainer adjustable to floor plane, glass or copper float, positive seating, outlets for iron or soil pipe connection.

DIMENSION CHART									LIST PRICES		
A-pipe size	B-str. diam.	C in.	D in.	E in.	F in.	G in.	H in.	Wt. lbs.	Coated (DC)	Galv. (G)	All bronze (BR)
1½-2	5	7	1-4	6	9	6¾	2	16	$17.00	$20.00	$26.00
3	5	9	1-4	8	11	9	2	26	21.00	24.20	35.00
	7	9	1-4	8	11	9	2	27	24.00	27.20	38.00
4	7	9	1-4	8	11	9	2	29	29.50	34.50	45.50
Deduct for back water control 2-3″									$3.00	4″	$4.00

Z-280 Floor or Area Drain

Recommended for any floor construction, grate adjustable to floor plane. Furnished in heavy Dura-coated cast iron, galvanized or bronze, outlet threaded or inside caulk.

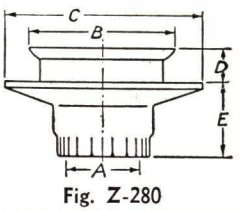


Fig. Z-280

DIMENSION CHART						LIST PRICES		
A-pipe size	B-str. diam.	C inches	D inches	E inches	Wt. lbs.	Coated (DC)	Galv. (G)	All bronze (BR)
1½-2	5	7	1-4	2½	7	$6.50	$7.35	$10.20
3	5	9	1-4	2¾	9	7.75	9.00	12.75
	7	9	1-4	2¾	10	10.75	12.00	15.30
4	7	9	1-4	2¾	12	11.50	13.20	16.60
Strainer rest 3″ high add						.50	.60	.80
Strainer rest 4″ high add						1.00	1.20	1.60

SWIMMING POOL DRAINS AND DEVICES

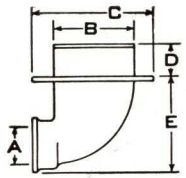


Fig. Z-805

Z-805 Main Outlet Swimming Pool Drain

Side outlet construction generally simplifies installation. Zurn Discharge Drain, Z-805, has an exceptionally large drainage area and should be installed where quick drainage of pool is desirable. Body is Dura-coated cast iron with polished bronze strainers and rims. Hub or threaded outlet as required.

DIMENSION CHART						LIST PRICES				
A Pipe size, in.	B in.	C in.	D in.	E in.	Wt., lbs.	Coated (DC)	Galv. (G)	All Bronze (BR)	Bronze Rim and Strainer Coated (CB)	Bronze Rim and Strainer Galv. (GB)
4–5–6	12x12	17x17	4⅜	13⅝	85	$34.00	$45.50	$94.00	$43.00	$52.50
Clamping Collar—Add						2.00	2.50	3.50	.....	.....
Chrome Plated Strainer—Add						.....	4.00	.....	.....	.....
White Metal Strainer—Add						.....	9.00	.....	.....	.....

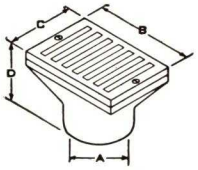


Fig. Z-820

Z-820—Z-830 Gutter Drains

Designed for scum and other narrow gutters. Bronze body—polished strainers. Outlets threaded. Z-830 Angle Outlet

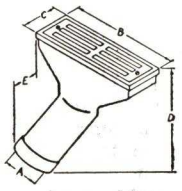


Fig. Z-830

DIMENSION CHART					LIST PRICES		
A Pipe size, in.	B in.	C in.	D in.	Wt., lbs.	Pol. or N.P. strainer	Chrome strainer	W. Metal strainer
1½–2	4	2¾	2½	1¾	$4.50	$5.10	$6.00
1½–2	9	1½	2¾	2½	7.00	8.00	9.00
1½–2½	10	2⅜	2¾	3½	8.50	9.50	11.25
2 –3	5½	2¾	2½	3¼	7.00	8.00	9.75
2 –3	12	4	2¾	15½	15.00	16.50	18.50
Z-830 1½–2	9	2½	7½	7	10.50	11.10	11.50

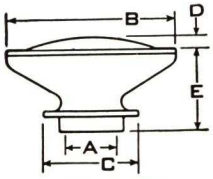


Fig. Z-850

Z-850 Flushing Inlet with Anchorage Flange

The Zurn Inlet, Z-850, is designed for dual service. It discharges a diverging spray for flushing the surface of the pool in addition to supplying clean water for circulation. It is designed for use where anchorage is desirable and where flashing is not required. Regularly supplied with heavy cast bronze bodies, polished convex slotted heads, threaded pipe connections. (Perforated or slotted flat face plates furnished if desired.

DIMENSION CHART						LIST PRICES		
A Pipe size, in.	B in.	C in.	D in.	E in.	Wt., lbs.	Pol. or N.P. Head	Chrome Head	W. Metal Head
1½–2–2½	9	5	1	4	5½	$9.50	$10.10	$11.00

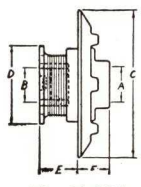


Fig. Z-865

Z-865 Swimming Pool Vacuum Cleaning Connection

The unit Z-865 is an exceptionally practical swimming pool vacuum cleaner connection. Ideally suited for pool cleaning systems. Bodies are heavy cast bronze Dura-coated. Faces with 2-in. iron pipe cleaning connection are polished bronze. This connection is designed with adjustable sleeves with clamping collars and threaded for pipe connections.

DIMENSION CHART							LIST PRICES				
A Pipe size in.	B in.	C in.	D in.	E in.	F in.	Wt. lbs.	Coated (DC)	Galv. (G)	All Bronze (BR)	Chrome Face	W. Metal Face
1½–2	2	9½	5	1⅞–3	2⅜	14	$10.50	$11.50	$14.50	+$1.00	+$2.50
3	2	9½	5	1⅞–3	2⅜	15	11.50	12.50	16.00	1.00	2.50
4	2	9½	5	1⅞–3	2⅜	16	12.50	14.00	17.50	1.00	2.50
Less Clamping Collar—Deduct							1.00	1.50	2.50	....	....

Z-855 Recirculating Fitting

Dura-coated body, adjustable bronze face. New flow regulating device (Detail "A") assures correct circulation. Complete line of standard pool inlets and outlets available.

Detail A

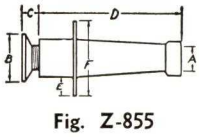
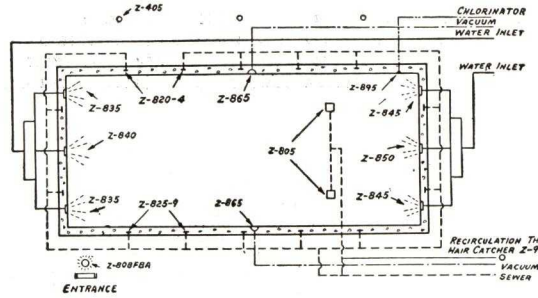


Fig. Z-855



Typical Swimming Pool Layout of Supply and Drainage

Z-810 Angle Type Reversible Discharge Drain

Zurn Angle Discharge Drain is adaptable to both side and bottom connection and is recommended for bottom circulating outlets and main discharge. Bodies are Dura-coated cast iron, with polished bronze frames and strainers. Furnished with positive clamping device and with either threaded or hub outlets.

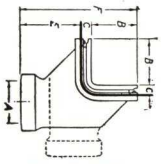


Fig. Z-810

DIMENSION CHART						LIST PRICES				
A Pipe size, in.	B in.	C in.	E in.	F Face in.	G Width, in.	Coated	Galv.	All Bronze	Bronze Rim and Strainer Coated	Bronze Rim and Strainer Galv.
2–3–4	5	1⅛	2⅝	8¾	7	$18.75	$21.00	$48.50	$26.75	$29.00
4–5–6	7	1⅛	8⅝	16¾	10	28.00	36.00	71.50	40.00	46.00
Chrome Plated Rim and Strainer—Add						small $4.00			large $ 6.00	
White Metal Rim and Strainer—Add						small $9.00			large $16.00	

Z-808-FBA Antiseptic Foot Bath Drain

Designed to simplify foot bath provision for pools. Such bathing is made compulsory by installing directly at entrance. Bronze head has removable watertight floor plate to retain antiseptic, and can be easily removed by spanner wrench for drainage and cleaning. Supplementary strainer beneath solid top. Outlet for threaded or caulk connection.

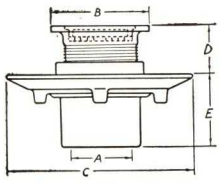


Fig. Z-808 FBA

DIMENSION CHART						LIST PRICES				
A Pipe size, in.	B in.	C in.	D in.	E in.	Wt. lbs.	Dura-Coated	Galv.	All Bronze	C.P. Top	Add for Locking Device
2	5	9½	1¼–2¼	3¾	18	$19.50	$22.00	$28.00	$1.00	$5.00
3	5	9½	1¼–2¼	3¾	18	19.50	22.00	28.00	1.00	5.00
4	5	9½	1¼–2¼	3¾	18	19.50	22.00	28.00	1.00	5.00
Clamping Collar deduct						1.00	1.50	2.50	....	....

Z-900 Hair Trap

An efficient trap insuring retention of all hair, lint, string and foreign substances from entering recirculation pumps, etc. Bronze mesh removable screen bucket with cleanout and blow-out connection. Furnished in heavy Dura-coated cast iron with tight gasket cover. Connections for threaded or flanged pipe.

Fig. Z-900

A–B Pipe size, in.	Wgt. lbs., approx.	Threaded or hub Black	Threaded or hub Galv.	Flanged Black	Flanged Galv.
2	90	$73.00	$82.50	$102.20	$115.50
3	89	73.00	82.50	102.20	115.50
4	88	75.50	84.70	105.70	118.55
5	85	76.50	85.70	107.10	120.00
6	86	77.50	87.00	108.50	121.80

Fig. Z-855

DIMENSION CHART							LIST PRICES				
A Pipe size, in.	B Dia. in.	C in.	D in.	E in.	F in.	Wt. lbs.	Coated (DC)	Galv. (G)	All Bronze (BR)	Chrome Face	W. Metal Face
1½–2	4	¾–2	12½	1⅝	6⅝	13	$ 8.50	$10.00	$14.30	+$ .60	+$1.80
3	6	¾–2	12½	1⅝	6⅝	16	13.50	15.00	22.00	1.00	3.25
Clamping Collar—Add							1.00	1.50	2.50	....	....

CLOSET AND LAVATORY CHAIR CARRIERS

The constantly increasing use of wall hung fixtures has created a demand for specialization in this field, taking into account the necessary requirements to compensate for varying building construction. The features incorporated in Zurn Carriers provide for universal adjustment during the process of installation and for rigidity and security after installation is made.

Outstanding features include:
Cantilever Construction
Adjustable Bearing Screws
2-in. Lateral Adjustment
Ample Vertical Adjustment
Provision for Roughing Dimensions

Catalog Z. C. includes cross sectional prints showing mechanical and design features in detail. A copy will be sent upon request.

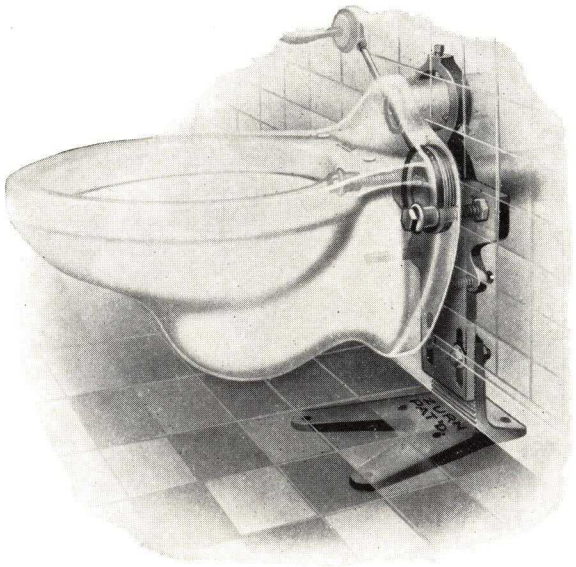


Fig. Z-1201 Closet Carrier

The Zurn Z-1201 Closet Carrier, illustrated above, incorporates all the features necessary for simple installation, coupled with ample weight for rigidity of construction to assure rigid installation. Note heavy Ratchet Type Base construction.

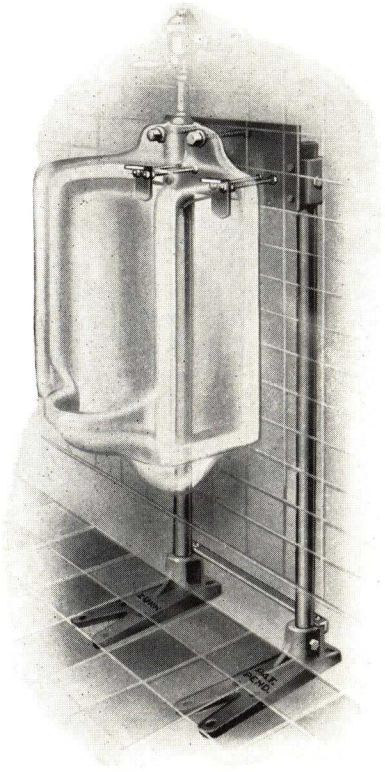


Fig. Z-1221 Carrier

The Zurn Carrier, Z-1221, is an adaptation for modern wall hung urinal bowl. In ordering carriers specify type by referring to bowl, giving manufacturer's name and bowl figure number. This type carrier is supplied with extra strong bodies and feet. "Dura-coated" finish. 1½-in. extra heavy steel legs

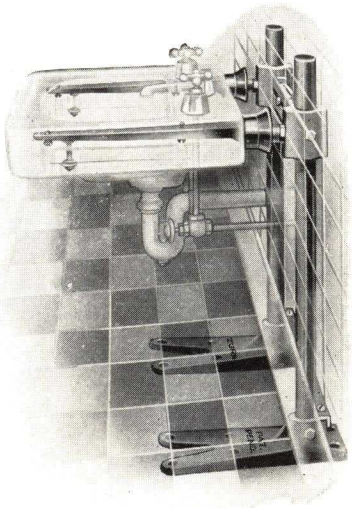


Fig. Z-1230 Carrier

The Zurn Carrier, Z-1230, is designed for lavatories in every kind of public or private place where concealed carrier arms are desirable. Locking devices for rigidly securing fixtures are available for use in mental hospitals and insane asylums. In ordering, specify lavatory by manufacturer's name, number and size

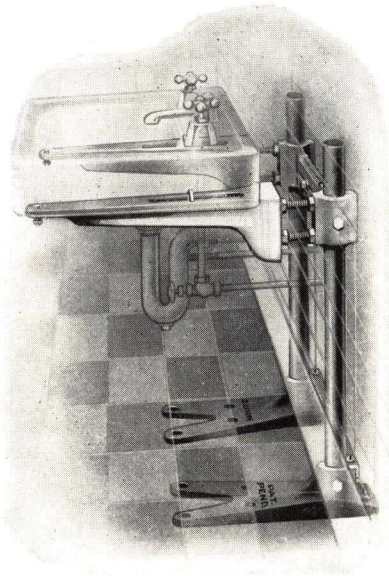


Fig. Z-1235 Carrier

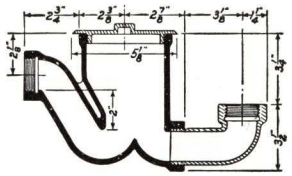
The Zurn Carrier, Z-1235, is recommended for heavy lavatories, sinks, sterilizers, etc., public or private, with exposed carrier arms available either painted or enameled. Specify fixture by manufacturer's name, figure number and size when ordering carriers. This type carrier is furnished with white enamel arms, Dura-coated brackets, legs and feet

All Zurn Carriers have leveling or adjusting screws, and use of cantilever construction assures full support of fixtures entirely on the carrier and not on the wall.

BATH AND LAVATORY TRAPS

Zurn Bath and Lavatory Traps are of unique design and incorporate unusual self-cleaning features. Besides completely changing water seal with each discharge from tub, the design causes water to swell strongly and wash inside walls. Large cleanout gives wide excess space and syphonage of water seal is definitely resisted by design features. The seal itself is a Zurn design that has been widely approved and used. It is a positive guard against backing up of sewer gases and odors. It would be difficult to find more ideally designed traps than Zurn's.

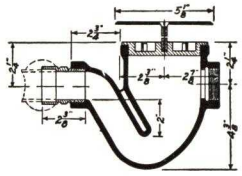
Blueprint cross-sectional drawings in Catalog No. 29C show the excellent design and construction features of the entire line of Zurn Traps. A copy will be sent upon request.



Z-1101 Residence and Apartment Bath Trap

With C.P. Cleanout. Design assures complete change of water seal with each discharge of tub—can be installed between 6-in. joints, 1½-in. connections

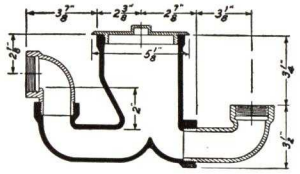
List prices—
Coated (DC)..$4.40 Galv. (G)..$6.00
All Bronze (BR)..$10.00



Z-1108 Dwelling House Bath Trap

Incorporating self-cleaning features—complete change of seal with each discharge of tub—cleanout fitted with C.P. Access Cover for proper leveling at finished floor—easily installed between 6-in. joints, 1½-in. connections

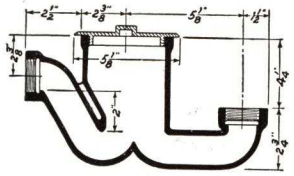
List prices—
Coated (DC)..$6.10 Galv. (G)..$7.10
All Bronze (BR)..$10.10



Z-1111 Adjustable Bath Trap

Self-cleaning with cleanout opening large enough for easy access—chromium plated cover, adjustable outlet, installation within 6-in. joints, 1½-in. connections

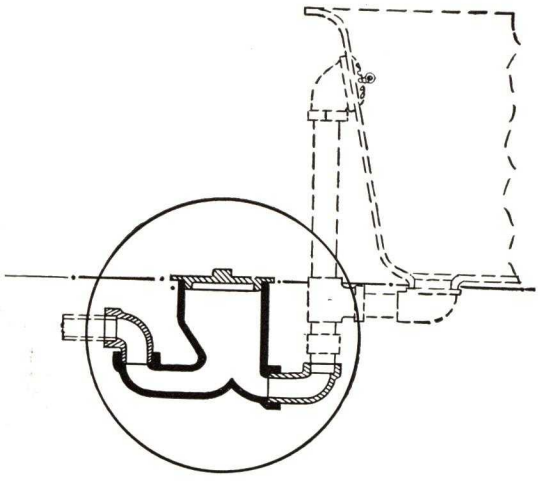
List prices—
Coated (DC)..$5.00 Galv. (G)..$6.90
All Bronze (BR)..$12.00



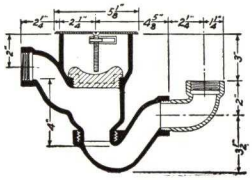
Z-1120 Tub and Shower Trap

Self-cleaning and rapid discharge—C.P. Cleanout large enough for easy cleaning, installed within 6-in. joints, 2-in. connections. Particularly adaptable for therapeutic baths

List prices—
Coated (DC)..$5.50 Galv. (G)..$7.00
All Bronze (BR)..$13.00



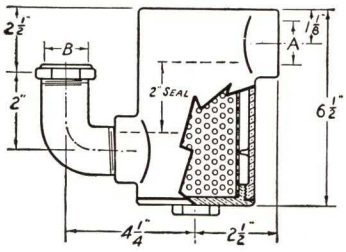
Detail of Installation



Z-1140 Hospital Bath Trap

Non-syphoning and self-cleaning, adjustable 1½-in. connections for any lateral direction, cleanout protected by seal, floor level adjustment, C.P. Cover for proper finishing.

List prices—
Coated (DC)..$6.80 Galv. (G)..$10.90
All Bronze (BR)..$21.40



Z-1175 Hair Interceptor

Cast bronze of required finish, removable bronze intercepting screen for cleaning, correct replacement assured by unique design, ideal for use in barber shops, beauty parlors, etc.

List prices—

Polished or Nickel plated bronze....$16.00	Wt. 6 lbs.	A—Outlet	B—Inlet
Chromium plated bronze..... 20.00	Wt. 6 lbs.	1¼-1½ I.P.	1¼-1½ Slip

THE "GREASEPTOR"

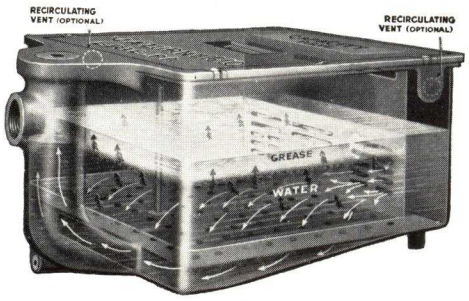


Fig. Z-1170-71

Grease interception is a problem of specialized consideration and, due to the lack of this type of thinking, there have been placed on the market, devices which purport to accomplish grease interception but which fall far short of so doing. There are three outstanding points to consider in the problem of grease interception:

(1) ***Purpose***—To prevent grease from entering and clogging drainage and sewer lines.

(2) ***Method***—To separate, congeal, and intercept the grease as nearly as possible to the point of discharge from fixture.

(3) ***Essential Requisites***—Intercepting of full grease content in waste water; ease of grease removal; ease of thorough cleaning.

There is no mystery with a problem so simple, yet it is amazing to find such wholesale misunderstanding of the simple problem involved, primarily due to the lack of knowledge both with respect to user and seller alike, with the inevitable result of a wide misuse of grease interceptors.

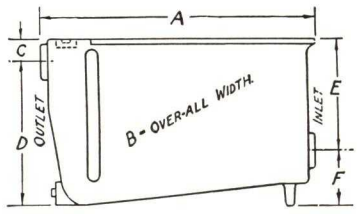
Zurn engineers have taken the above simple problem and reduced it to a design which accomplishes every purpose.

The illustration shown clearly indicates the manner in which grease interception is accomplished in the "Greaseptor," detailed principles of which are shown in the drawings below.

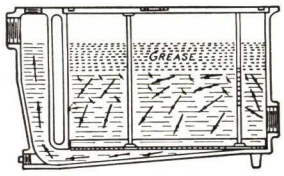
The deluxe model "Greaseptor" provides for removal and cleaning by simply removing top cover. Unique design of grease basket can be readily cleaned and the cover cannot be put back into place without all interior basket parts similarly being replaced.

The standard model "Greaseptor" is identical in construction and design, excepting that the grease must be removed by skimming from the top of the trap after removing cover.

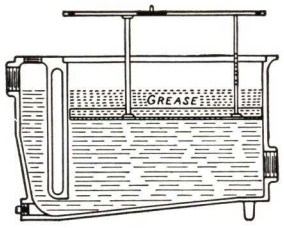
A grease interception efficiency of 95% plus can be secured through correct installation. Recirculating vent connections (optional) provide for removal of foul odors during normal period of operation, although these are not essential to efficient operation. Double wall trap meets with all Local, State and National code requirements.



Full Rectangular Shape—Provides maximum water content, eliminating angles and slowing current movement to further extend grease separation and congealing. Uniform design makes possible the installation at floor level at minimum expense.



Operation—Inlet below water level immediately retards flow which is further accentuated by unique diffusing baffle immediately adjacent to inlet, causing breaking up and slowing down of flow before entering main intercepting chamber, and practically eliminating all turbulation, so that as grease congeals and rises the main flow of water continues through perforated bottom baffle which further retards flow and thus the clear water flows on to outlet.



Ease of Grease Removal—Cover and grease basket are made integral. Cover cannot be replaced without grease basket (deluxe model only). Full airtight gasketed cover is secured by four easily removable bolts, or if preferred, can be unsecured to body as gasket is airtight and, if connected with recirculating vents, there is no danger of foul air entering the building.

SPECIFICATIONS AND PRICE SCHEDULE

Size No.	Recommended for	Flow cap., gal. per hr.	List prices		Inlet and outlet conn. i.p. or hub in.	A Length in.	B Width in.	C in.	D in.	E in.	F in.
			Z-1171 Deluxe model	Z-1170 Standard model							
4-C	Small sinks	420	$35.00	$25.00	1½–2	18¼	11½	2	9⅛	7½	3⅝
5-C	Medium sinks, small dishwashers	540	60.00	46.00	1½–2	20¼	13½	2	9⅝	8	3⅝
7-C	Diet sinks, dishwashers	730	80.00	65.00	1½–2	22¼	16½	2	9⅝	8	3⅝
9-C	Large sinks, large dishwashers	950	120.00	97.00	2–3	26½	17	2½	12⅛	10½	4⅛
15-C	Two or more sinks, institutional	1500	156.00 (standard model only)	156.00	3–4	32½	20	3½	14⅛	12	5⅛
24-C	Main drainage line installation	2400	275.00 (standard model only)	275.00	3–4	37	24	3½	14⅜	12¼	5⅛

HOSPITAL, PLASTER AND DENTAL INTERCEPTORS

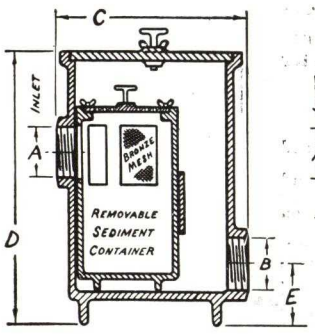


Fig. Z-1180

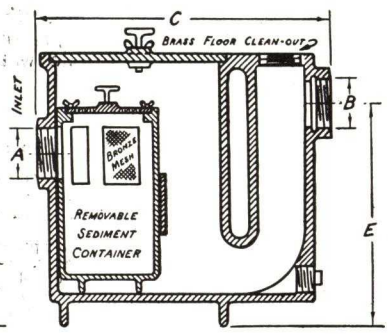


Fig. Z-1185

Invaluable for the interception of solids such as plaster of paris, cotton, lint, hair, etc. Adaptable also for unusual interception problems such as jewelry and optical grinding.

Waste water is all directed into removable sediment container from which none of the solids referred to can pass through, and the container is easily removable for cleaning and is so designed that its reinsertion into the trap is always in the correct position. The integral trap embraced in Fig. Z-1185 makes for simpler installation.

Interceptors regularly supplied in painted white enamel with brass fittings. Also available with porcelain enameled interior or exterior, with chrome plated fittings.

Z-1185 Hospital Plaster Interceptor

Porcelain enameled exterior with accessible cleanout for removing bronze mesh retainer—plaster and any other solids completely retained without restricting liquid flow—integral trap with cleanout assures correct installation—1½ or 2-in. connections.

List price $148.00. Weight 190 lbs.

Z-1180 Dental Interceptor

Polished aluminum body with accessible cleanout cover for removing bronze mesh retainer for cleaning. All solids positively retained without restricting liquid flow—1½ or 2-in. connections.

List price $42.00. Weight 8 lbs.

THE DURO COMPANY

ESTABLISHED 1915

DAYTON, OHIO

NEW YORK OFFICE: 50 Church street — LOS ANGELES OFFICE: 7267 Beverly Boulevard — BOSTON OFFICE: 175 High Street

SALES AND SERVICE BRANCHES IN ALL PRINCIPAL CITIES

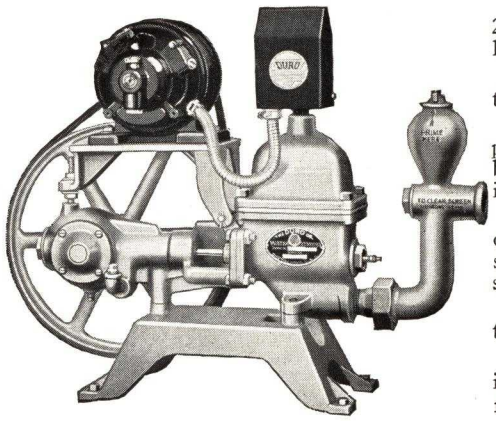
THE DURO COMPANY are specialists in Water Treatment, Water Softening and Water Pumping Systems and Equipment.

Manufacturers of Water Softeners for domestic and industrial application; Water Filters for removing iron, sediment, taste, color and odors; Automatic Electric Pumps for deep or shallow wells; Complete Water Systems; Pneumatic Galvanized Pressure System Tanks; Power Pumps for operating with gasoline engine or from overhead power shaft and complete pump accessories.

Every part of every unit bearing the Duro Trade Mark is made under one factory roof, placing the entire responsibility for satisfactory and guaranteed service at one central point, THE DURO COMPANY, Dayton, Ohio.

"Over a Million Users"

Shallow Well Pumps



Capacities—230 to 720 gallons per hour.

Brass fitted throughout.

Double main phosphor-bronze bearings.

One-piece drop-forged steel crankshaft.

Two-pole automatic switch.

Repulsion-induction Duro motor.

SPECIFICATIONS

Model	Capacity, gal. per hr.	Motor, hp.	Pipe sizes, inches		Shipping weight, lbs.
			Suction	Dischg.	
250	250	1/6	1″	3/4″	100
360	360	1/4	1″	3/4″	105
500	525	1/3	1 1/2″	1″	120
720	720	1/2	1 1/2″	1″	130

Approximate space required—width 27 in., depth 14 in., height 25 in.

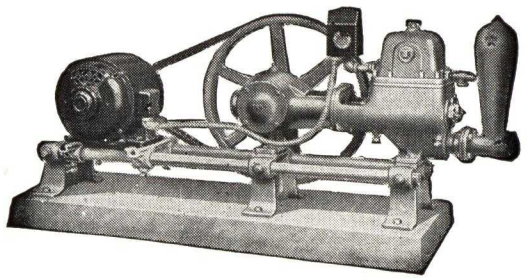
Above pumps are equipped with AC 110 or 110-220-volt 60-cycle or DC motors. Odd cycle motors can also be furnished as required.

Standard pressure 25-45 lbs. Above pumps can also be furnished with pressures up to 135 lbs. Specifications upon request.

Heavy Duty 100 Series Shallow Well Pumps

Equipped with Timken Roller Bearings

Capacities—800 to 2000 gallons per hour.



For unusually heavy pump service: Schools, swimming pools, large farms, estates, institutions, factories, etc.

SPECIFICATIONS

Model	Capacity, gal. per hr.	Motor, hp.	Pipe sizes, in.		Shipping weight, lbs.
			Suc.	Dischg.	
106	800	3/4	2	1 1/2	325
111	1200	1	2	1 1/2	375
121	1600	1 1/2	2	1 1/2	390
131	2000	2	2	1 1/2	400

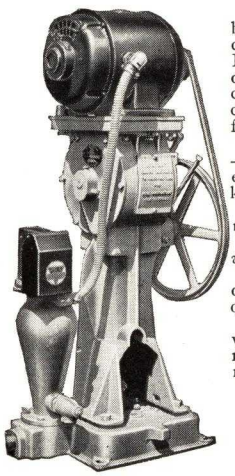
Approximate space required—width 60 in., depth 18 in., height 25 in.

Above pumps are equipped with AC 110-220-volt 60-cycle or DC motors. Odd cycle motors can also be furnished as required.

Standard working pressure 25-45 lbs. Above pumps can also be furnished with pressures up to 165 lbs. Specifications upon request.

Duro Deep Well Pumps and Systems

All strains central with the well, due to correct *vertical* design



Capacities: 160 to 2100 gallons per hour.
Depths: 22 to 500 feet.

No. 900 Deep Well Pumps—Various combinations with 1/3 to 1 hp. R-I motors with capacities from 165 to 550 gallons per hour. Maximum depth to 400 ft., against a pressure of 45 lbs. per sq. in. Single acting, steel encased, open type; or all-brass, closed type well cylinders. Bronze bearings. One-piece drop forged steel crankshaft.

No. 3000 Heavy Duty Deep Well Pumps—With single acting cylinders furnished as steel encased open type, or all-brass closed type. Timken roller bearing equipped.

Equipped with alternating or direct current motors from 1 to 3 hp. Completely automatic.

Either of the above models can be furnished with double acting well cylinders.

Capacity of deep well pumps depends on size of well, depth to water and amount of water required.

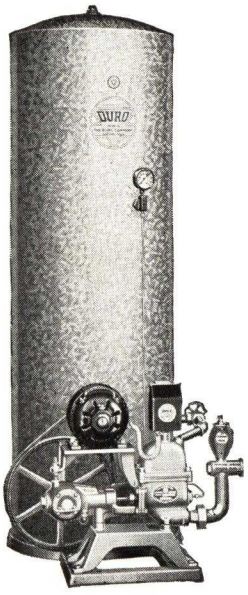
Send sketch of proposed installation together with following information and we will gladly make proper deep well water system recommendations.

Diameter of well.
Total depth of well—Depth to water level.
How many people will be served.
Number of bathrooms, listing all other water outlets.
Will water be used for sprinkling.

Complete Automatic Water Systems

A selection of any of the Duro shallow well pumps with vertical galvanized tank, pipe fittings and automatic air volume control with pressure gauge. Tanks in capacities of 30 to 1000 gallons. Pressure switch makes this unit completely automatic, with pressure regulated from 25 to 45 lbs.

Furnished with either vertical (shown) or horizontal type pressure tank, for complete automatic water service.



Other Duro Products

For smaller homes the No. 8 pump and systems (230 gallons per hour).

For fresh water service the Nos. 80 and 250 Freshflow, a 230 or 250-gallon per hour pump with a 2 1/2-gallon tank mounted on pump.

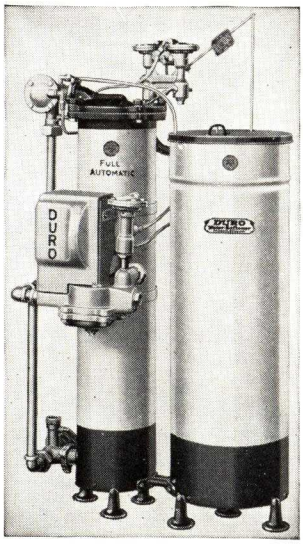
Cellar drainers, well cylinders, air pumps, automatic switches, float switches, foot valves, and special deep well couplings, are included in the Duro line making every combination of models, sizes and capacities possible.

Complete Specifications for the Architect Upon Request.

SPECIALISTS IN WATER SOFTENING AND WATER TREATMENT

Automatic Water Softeners

A built-in water meter *Automatically* starts and stops regeneration



Capacities:
A 60—96,000 } grain gallons
A 61—307,200 } between salt fillings

Fully automatic with meter control. After a specified number of gallons of water has been softened the mineral is regenerated by being washed with a given amount of brine. The meter measures the correct amount of water necessary to make this model completely automatic. No manual attention necessary, except to fill salt tanks when necessary. Tanks of white vitreous-porcelain enamel on Armco iron, finished on both the inside and outside. *Mineral*—highest grade Zeolite.

Size No.	Flow rate, g.p.m.	Size fittings	Dimensions, inches		
			Dpth.	Wdth	Hght.
A-60	12	¾″	24″	34″	50″
A-61	16	¾″	28″	36″	56″

Mon-O-Matic Water Softeners

Pushing control lever forward once starts and completes *Automatic* regeneration

Capacities: 10,000 to 30,000 grain gallons per regeneration.

Flow Rates: 12 to 16 gallons per minute.

Mineral: Highest grade Zeolite.

Automatic regeneration with float control, accomplished by simply pushing lever to starting position. When regeneration is complete lever returns to its original position. Fully enclosed unit with no exposed pipes or tubing. Furnished with porcelain enamel tanks only; tanks are enameled both inside and outside.

Size No.	Flow rate, g.p.m.	Size fittings, in.	Dimensions, inches		
			Dpth.	Wdth	Hght.
M-70	12	¾	20	28	58
M-71	16	¾	20	30	58
M-72	16	¾	20	30	60
M-74	16	¾	28	42	64

GALLONS SOFT WATER DELIVERED BETWEEN SALT FILLINGS ON FULL AUTOMATIC SOFTENERS

Grains hardness	10	14	18	20	24	28	32	36	40	50
A-60	9300	6600	5100	4600	3800	3250	2850	2500	2250	1800
A-61	29760	21120	16320	14720	12160	10400	9120	8000	7200	5760

ACTUAL U. S. GALLONS SOFT WATER DELIVERED BETWEEN REGENERATIONS ON HAND OPERATED AND PARTIALLY AUTOMATIC SOFTENERS

Grains hardness	10	14	18	20	24	28	32	36	40	50
M-70, SF-1	1010	720	555	500	415	355	310	275	245	195
M-71, SF-2	2020	1440	1110	1000	830	710	620	550	490	390
M-72, SF-3	3015	2160	1665	1500	1245	1065	930	825	735	585
M-74	4500	3210	2500	2250	1875	1605	1405	1250	1125	900
SF-6	6030	4320	3330	3000	2490	2130	1860	1650	1470	1170

Single Valve SF Water Softener

Single lever control—4 short turns complete regeneration

Capacities: 10,000 to 60,000 grain gallons per regeneration.

Flow Rates: 8 to 20 gallons per minute.

Mineral: Highest grade Zeolite.

Provided with both brine draw and salt level indicators. An all-bronze disc type single lever control valve simplifies regeneration. Tanks are of vitreous-porcelain or galvanize, finished both inside and outside. Models SF 1 and 2 are white porcelain, other porcelain models, black finish only.

Also furnished for downflow softening. When so furnished capacities are reduced 25%.

Size No.	Flow rate, g.p.m.	Size fittings, inches	Dimensions, inches		
			Dpth.	Wdth.	Hght.
SF-1	8	¾	14	24	54
SF-2	10	¾	16	26	60
SF-3	10	¾	16	28	67
SF-4	10	¾	20	32	60
SF-5	16	1	20	32	60
SF-6	20	1	26	34	66

Send Sample of Water for Free Analysis

Besides hardness, oftentimes water contains iron, sediment; or the taste, color and odor is bad.

Ask for *Free* container to send us a sample of the water from city supply, private well or cistern, and a complete analysis will be made, together with proper recommendations for the best equipment suited to Water Conditioning. No obligation. This is *Duro Free Advisory Water Analysis Service.*

Large Capacity Equipment for Estates, Factories, Schools, Apartments, Hotels, Etc.

Capacities—15,000 to 2,000,000 grain gallons per regeneration.

Flow Rates—9 to 334 gallons per minute.

Tanks—Steel, coated with special rust-resisting paint. A.S.M.E. code; for 100 lbs. per sq. in. maximum working pressure, tested for 200 lbs. hydrostatic pressure.

Important: Due to the fact that all jobs requiring this type of equipment are different, it is necessary that our Engineering Department to make proper recommendations. Write for special Architect's Bulletin on Industrial Water Softeners and Water Treatment Equipment.

GUIDE FOR SPECIFYING A DURO WATER SOFTENER

Service Line

Service line to be of proper size to deliver ____ gallons of water per minute. Pipe to be ____ inches or more in diameter.

Installation and Drain

Full sized valve connections between meter and water softener; also from outlet of softener to house lines connected directly with house sewer lines.

Water Softener

Model ____ DURO WATER SOFTENER, with ____ tank(s), and to give a capacity of ____ grain gallons, or ____ actual gallons of soft water between regeneration, based on ____ grains hardness of water to be softened.

Mineral—Highest grade synthetic Zeolite.

Tanks—"Armco" ingot iron, welded, in either vitreous-porcelain enamel or galvanized finish (as specified).

Softener Control Valve—Any of the following controls—Automatic—Mon-O-Matic—SF Single Lever.

Complete Specifications for the Architect Upon Request.

THE DEMING COMPANY

Manufacturers of Hand and Power Pumps for All Uses

SALEM, OHIO

GENERAL AGENCIES IN ALL PRINCIPAL CITIES

Deming Deep Well Turbine Pumps

Water Lubricated

Fig. 4700

Deming Turbine Pumps meet the requirements of laundries, factories, municipal water works, golf courses, creameries—wherever a plentiful supply of water is needed—also used for mines and mine sinking pumps.

Water lubrication, Goodrich cutless rubber bearings, adjustable semi-open type impellers and many other exclusive features make the Deming Turbine an outstanding pump in this field.

Deming Turbines are dependable and will give year after year of satisfactory service at minimum upkeep expense.

Turbine Bulletin contains complete information.

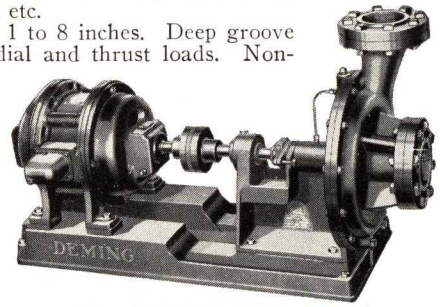
Deming-Mueller Side Suction Centrifugal Pumps

Ball Bearing

Can be used efficiently not only for general water supply, low or high heads, but the non-clogging feature of the impeller makes them ideal for handling screened sewage, mash, paper stock, molasses, starch, crude oil, unwatering building excavations, etc.

Furnished in sizes 1 to 8 inches. Deep groove ball bearings for radial and thrust loads. Non-clogging open type impeller gives exceptionally high efficiencies. Inside bearing is a bronze bushing of the oil-less type insuring long life.

Bulletin No. 4003 contains complete data including performance tables.

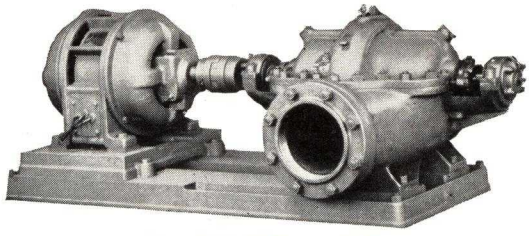


Figs. 4010, 4020, 4030 and 4040

Deming-Mueller Double Suction Centrifugal Pumps

Ball Bearing

General service pumps recommended for working pressures up to 200 pounds. Rotating elements are in perfect static and dynamic balance.



Figs. 5010, 5020 and 5030

Furnished in sizes 3 to 12 inches. Double-row, combined radial and thrust ball bearings. Enclosed type impeller with removable wearing rings for both casing and impeller.

Bulletin No. 5002 contains complete data.

Deming "Marvel" Shallow Well Water System

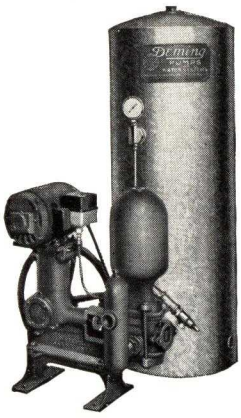


Fig. 2095

For Vertical Suction Lift of 25 Feet or Less

These systems are practically noiseless in operation and entirely automatic. Furnished complete with electric motor drive or gasoline engine, galvanized steel tank and all necessary fittings. Capacities 275, 375, 500 and 600 gallons per hour.

See Catalogue "C" for complete description.

Deming "Oil-Rite" Shallow Well Water Systems

Fig. 1809

For Vertical Suction Lift of 25 Feet or Less

For use where larger capacities than those listed above are required. Furnished complete with electric motor drive or gasoline engines, galvanized steel tank and all necessary fittings. Capacities 550, 930, 2000, 3000 and 4800 gallons per hour.

See Catalogue "C" for complete description.

Deming "Oil-Rite" Deep Well Water Systems

Fig. 1062

For Use in Wells Where the Water Level Is at a Greater Depth Than 25 Feet

Consists of pump and galvanized steel tank and fittings except piping and sucker rod. Furnished in 6, 10, 14 and 18 inch strokes. Capacities 100 to 3635 gallons per hour.

See Catalogue "C" for complete description.

ECONOMY PUMPS, INC.

HAMILTON, OHIO

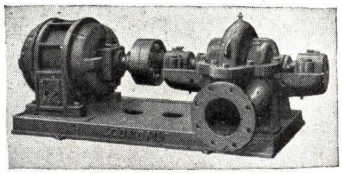
CHICAGO OFFICE, 2522 W. Congress St.

NEW YORK OFFICE, 1 E. 42nd St.

REPRESENTATIVES

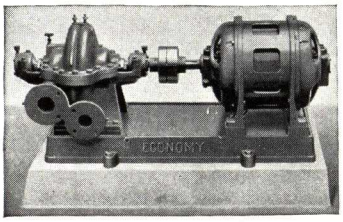
BALTIMORE, MD., W. I. Collier & Co., 522 Park Ave.
BIRMINGHAM, ALA., McVoy-Hausman Co., 2019 Sixth Ave., No.
BOSTON, MASS., Emerson Swan Goodyer Co., 107 Arlington St.
Monahan Pump & Equipment Co., 10 High St.
BUFFALO, N. Y., Park Duncan, 319 Main St.
CHARLOTTE, N. C., Charles M. Setzer Co.
CINCINNATI, OHIO, E. C. Williams, 4028 Egbert Ave.
DALLAS, TEX., Allan Engineering Co., 2712 Live Oak St.
DENVER, COLO., Crane-O'Fallon Co., 1631 Fifteenth St.
DETROIT, MICH., F. H. Patterson, 9201 Boleyn Ave.
Kerr Machinery Corp., E. Fort and Beaubien Sts.
HOUSTON, TEX., Southern Engine & Pump Co., 900 St. Charles St.
INDIANAPOLIS, IND., M. D. Mullane, 339 Burgess Ave.
JACKSONVILLE, FLA., J. C. Pastor, 1091 Talbot Ave.
KANSAS CITY, MO., D. H. Painter, 7331 Brooklyn Ave.
MEMPHIS, TENN., Power Equipment Co., 1348 Madison Ave.
MILWAUKEE, WIS., C. A. Ekstrom Co., 2540 W. Wells St.
MINNEAPOLIS, MINN., Kent-Ervin Engineering Co., Builders Exchange Bldg.
NASHVILLE, TENN., W. C. Armistead, 107 Main St.
NEW ORLEANS, LA., Mayer Godchaux, 510½ Audubon Bldg.
NEW YORK, N. Y., Quimby-Ryan Engineering Sales Co., 1 East 42nd St.
OKLAHOMA CITY, OKLA., Loeffler-Greene Supply Co., 1604 N. W. 5th St.
PHILADELPHIA, PA., Haynes Selling Co., Inc., S. E. Corner Ridge Ave. and Spring Garden St.
PITTSBURGH, PA., Keystone Sales Co., P.O. Box 4201, Bellevue Sta.
SAN FRANCISCO, CALIF., Phil M. Hunt, 116 New Montgomery St.
SYRACUSE, N. Y., Syracuse General Sales Co., Yates Hotel Bldg.
WISCONSIN RAPIDS, WIS., Badger Sales Co., Mead-Witter Bldg.
DOMINION OF CANADA, Crane Ltd., 1170 Beaver Hall Square, Montreal

Double Suction Pumps



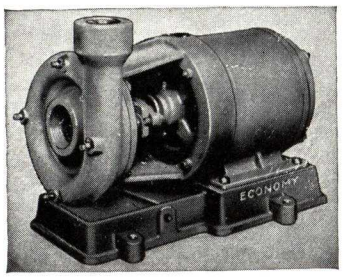
Horizontally split case single stage pumps for general house supply service at heads of 200 ft. or less, also for hot water, air washer, swimming pool circulation, etc. Capacities from 25 to 5000 g.p.m. at moderate speeds.

Multi-Stage Pumps



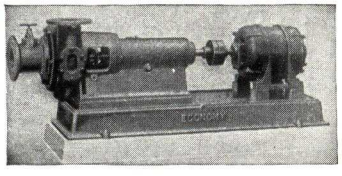
Horizontally split case multi-stage pumps for general house supply service at heads of 200 to 700 ft., also for boiler feeding, elevator service, etc. Capacities 100 to 1000 g.p.m. at moderate speeds and with minimum power.

Close Coupled Pumps



For small house supply, air conditioning, ice water circulation, etc. Capacities 10 to 300 g.p.m. These pumps have built-in ball bearing motors with impeller mounted on an extension of the motor shaft. At 1750 r.p.m. they are good for heads to 100 ft., at 3450 r.p.m. to 250 ft.

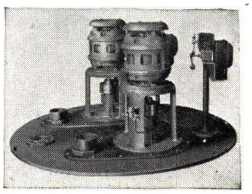
Non-clogging Sewage Pumps



Capacities up to 20,000 g.p.m. Heads up to 150 ft. These pumps are made in both horizontal and vertical types. They are used for pumping raw sewage, industrial waste, paper pulp, etc., in sewage lift stations and in place of conveyors in industrial plants. We are in a position to furnish complete sewage and process pumping equipment.

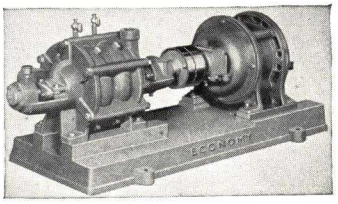
Sump Pumps and Sewage Ejectors

Made in general service and non-clogging types. Non-clog pumps pass rags and other solids which may be present in raw sewage. All of these pumps are heavy duty design, with ball bearings and registered motors, with full automatic control. Several types of dry chamber installations available for the larger jobs.



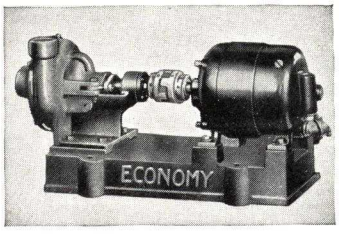
Small Multi-Stage Pumps

These pumps are used for the same purpose as our larger horizontally split case units, but because of the smaller capacity (10 to 100 g.p.m.) they are of different mechanical construction. These are special little units for heads up to 450 ft.



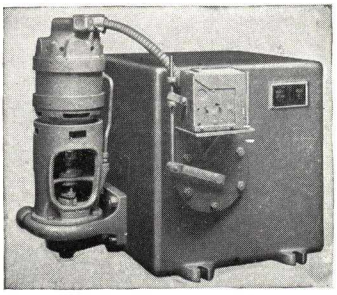
Single Stage Single Suction Pumps

These pumps are used for moderate priced work where the head does not exceed 120 ft. They are frequently used for intermittant house supply service, swimming pool circulation, summer air conditioning, etc. Capacities from 10 to 3000 g.p.m.



Condensation Pumps

Used with gravity and vapor heating systems for returning condensate to boiler and for collecting returns from low radiation. The illustration shows only one of seven types available in the Hoffman-Economy line. Made for boiler pressures from 10 to 200 lbs. and capacities from 1000 to 300,000 sq. ft.



ECONOMY'S NEW PUMP DATA AND PRICE BOOK

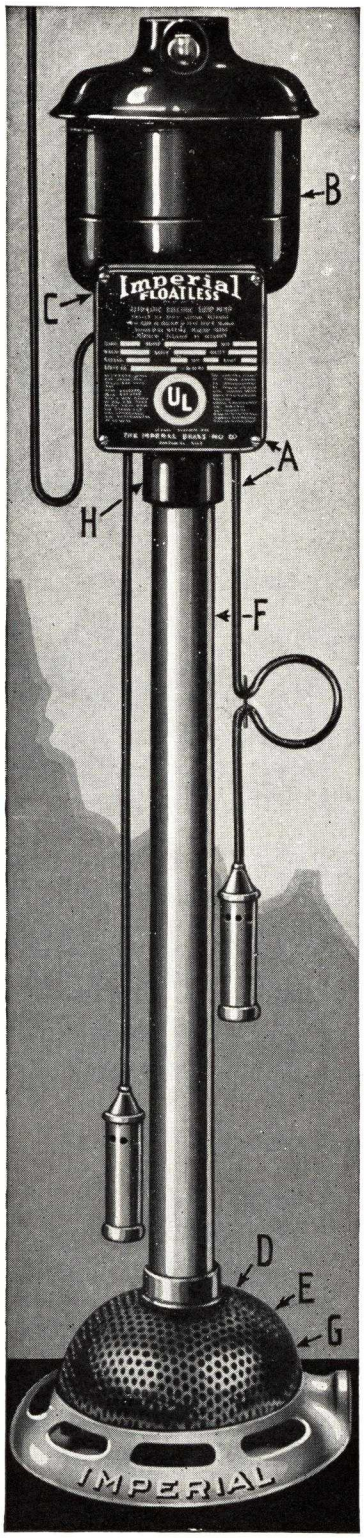
A new handbook indispensable to anyone interested in pump engineering. Covers pumping applications for practically any requirement. Book is divided into two parts, the first being devoted to the various classes of pumps manufactured, showing costs, characteristics, etc. The second part is a valuable engineering data section, with a "Use Index" in the back.

You can secure your copy by writing on your business letterhead.

THE IMPERIAL BRASS MANUFACTURING CO.

Imperial "Floatless" Automatic Electric Sump Pumps for Removing Seepage, Overflow, Drainage and Flood Water and for Backwater Prevention

1200 West Harrison St., CHICAGO, ILL.



Six Models
For All Sump Depths

IMPERIAL *"FLOATLESS"* AUTOMATIC ELECTRIC SUMP PUMPS

(Approved by Underwriters' Laboratories)

Imperial FLOATLESS

SPECIFY SUMP PUMPS FOR THESE PURPOSES

1. Removing Drainage, Seepage, Overflow and Flood Water from Basements or Other Points Below Sewer Level. Sump pumps are used in residence, apartment, office building, factory and garage basements and similar places where it is necessary to raise floor drainage, seepage, overflow or flood water from sumps, settling basins, flywheel, elevator and scale pits, etc., located below sewer level.

2. Providing Drainage in Basements, Well Houses, etc., Where Municipal Sewers Are Not Available. Sump pumps are used to remove waste from floor drains, laundry tubs, boiler pits, etc., from basements in buildings located outside city sewer limits.

3. Preventing Backwater in Basements and Other Places Close to Sewer Level. A sump pump installed with backwater prevention hookup, will provide positive protection wherever sewer level or sewer capacity makes backwater a possibility. Eliminates danger of having heating unit and other equipment, furnishings, etc., flooded. See Figs. 1 and 2.

The Maker of Imperial "Floatless" Sump Pumps—THE IMPERIAL BRASS MFG. CO. has specialized for years in sanitary equipment, and its contributions in this field are outstanding. Its engineers are responsible for the most successful electrical sump pumps now on the market. The IMPERIAL FLOATLESS AUTOMATIC ELECTRIC SUMP PUMP incorporates in its design the successful and proved features of other pumps and eliminates the main objectionable feature, namely, the float. It has been approved by the Underwriters' Laboratories, whose insignia is on the name plate of each pump.

See Separate Catalogs for other well known IMPERIAL plumbing products —Watrous Flush Valves and Watrous Liquid Soap Dispensers.

SPECIAL ADVANTAGES OF IMPERIAL *"FLOATLESS"* SUMP PUMPS

(Letters Designating the Following Points Refer to Illustration at Left)

A. Floatless Electrical Control; Low Pump Down—The essential function of an automatic sump pump is to begin pumping automatically when the water which accumulates in the sump pit reaches a given level. Therefore, a sump pump is no more reliable than the mechanism which controls its automatic operation.

The Imperial "Floatless" Automatic Electric Sump Pump uses a new, thoroughly proved principle of electrical control, which completely eliminates the need for a float and which offers positive reliability never before attainable.

The motor on the Imperial pump is controlled not by a float, but by two stationary electrodes which hang into the pit and can be adjusted to start and stop the pump within any limits desired. Motor starts when water reaches upper electrode and stops when water drops below lower electrode. Mud, debris or corrosion do not affect starting or stopping because there is no float to stick, clog or become damaged.

This electrical control also offers another advantage in that a LOWER PUMP DOWN is possible. The lower electrode hangs very close to the floor of the pit and

How Imperial *"Floatless"* Sump Pumps Insure Basement Against Backwater

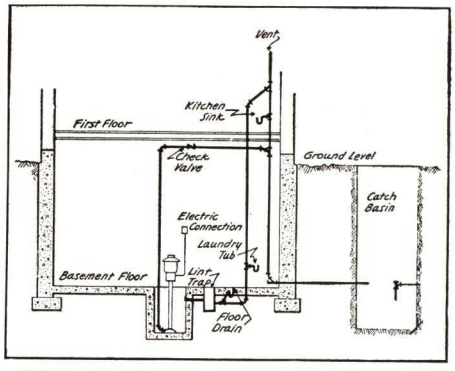


Fig. 1—This sump pump hookup provides positive protection against backwater even in the most severe cases. Note that basement is cut off entirely from direct connection with city sewer, and floor drain and laundry tubs both empty into sump.

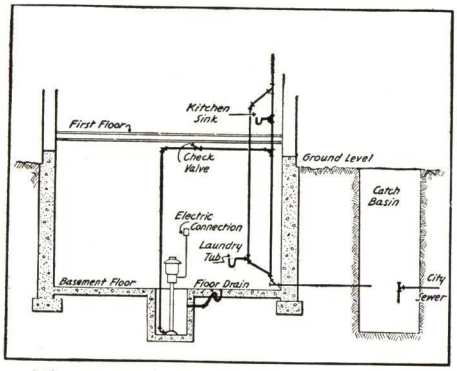
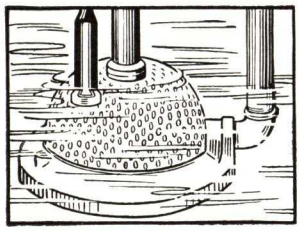


Fig. 2—This hookup is for less severe cases and will give protection against backwater to the height of the laundry tubs. Note that here the tubs drain directly into the catch basin as in an ordinary hookup, while the floor drains to the sump.

water can be pumped down to within 2¾ in. of the bottom. Due to the space occupied by a float, 12 in. from the bottom is about the lowest depth float-operated pumps can reach.

Furthermore, with the Imperial design, water can be pumped even lower than the bottom electrode by pressing plunger H.



B. Special Motor Design—Imperial Model A pumps are equipped with General Electric, ⅙ H.P. custom built motors with oil-sealed ball thrust bearing for vertical operation. Standard unit 60 cycles. (25 and 50 cycles furnished at slightly extra cost.) Motor does not give radio interference. Models B, C, D, E and F are equipped with General Electric ¼ H.P. custom built motors, a wide variety of current characteristics being available without extra charge.

C. Positive Acting Circuit Breaker—The Imperial Sump Pump has a circuit breaker incorporated within its electrical control mechanism. Breaker opens in 17 seconds on a dead stall. This prevents injury from motor overload or excessive heat generated. Only necessary to push button to reset breaker.

D. Special Long-Life Bearings—Model A pumps have special water-lubricated bronze bearings which are designed to assure long life and easy operation. Models B, C, D, E and F have an adjustable impeller bearing of the tapered pin type. Centrifugal force by the impeller has very little effect on this bearing and it contributes greatly to balanced action and long life. Also incorporated in Models B, C, D, E and F are oilite shaft bearings. The suspension of revolving parts is such that lower bearing is relieved of practically all downward thrust.

E. Forged Impeller—Extremely Durable—The life of a sump pump depends on IMPELLER BALANCE more than any other detail in its construction. The forging gives a homogeneous, hard impeller so durable that no part of it becomes worn enough to cause uneven running. IMPERIAL makes the only sump pump on the market using a forged impeller.

F. Bronze Construction—Can Never Rust—Another very effective factor assuring long service is the choice of materials. COPPER and BRONZE, which cannot rust, are used exclusively on IMPERIAL PUMPS.

G. Larger Strainer Area—Easy to Clean—IMPERIAL SUMP PUMPS have the largest strainer area in proportion to capacity—80 sq. in. on Models B, C, D, E and F, and 60 sq. in. on Model A.

By loosening the snap ring that holds it in place, the strainer may be lifted to the top of the shaft for convenience when cleaning. IMPERIAL is the only sump pump that has this feature.

H. Started by Hand, if Desired—Whenever required, the motor can be started by pressing the plunger H. The motor runs as long as the plunger is held. An exclusive feature.

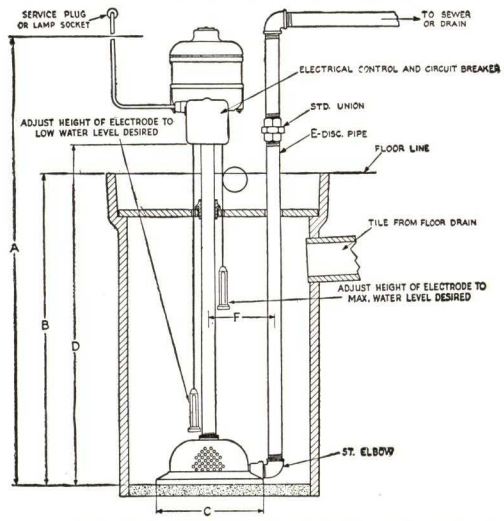
Sizes, Capacities, Weights and List Prices—Imperial "Floatless" Sump Pumps

Model	Pipe Connection, In.	Maximum Sump Depth, Ft.	*Approximate Capacity Gallons per Hour Against Total Discharge Head of					Weight, Boxed Pounds	Size of Motor, H. P.	List Price
			1 Ft.	5 Ft.	10 Ft.	15 Ft.	20 Ft.			
A	1	2	1600	1500	1300	900	200	57	⅙	$ 39.50
B	1¼	2	3600	3200	2600	1900	1000	70	¼	65.00
C	1¼	3	3600	3200	2600	1900	1000	80	¼	85.00
D	1¼	4	3600	3200	2600	1900	1000	100	¼	100.00
E	1¼	6	3600	3200	2600	1900	1000	120	¼	125.00
F	1¼	8	3600	3200	2600	1900	1000	140	¼	150.00

*To determine total discharge head, measure vertical distance, or elevation in feet from bottom of sump to highest point in discharge line, and add one-third foot for each 20 feet of horizontal pipe and one-third foot for each elbow.

INSTALLATION

Reference to the sectional view shows the simplicity of installation. The floor sump can be made by sinking a piece of 18 or 24-in. (larger size better) sewer crock into the floor. Bottom of control switch should be installed at least 3½ in. above floor. The discharge (E) is piped to the nearest sewer or surface outlet by the shortest and straightest line (except when



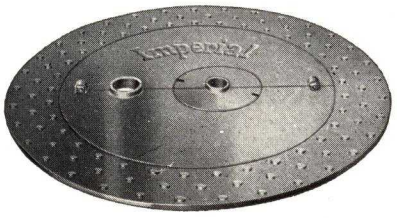
pump is used for prevention of backwater; see Figs. 1 and 2). Be sure that the elecric current is the same as specified on motor and that the electric current is permanently connected in the plug used. Attach connecting wire to plug, and pump is ready for operation. Explicit instructions with each pump.

It is recommended that the sump be covered to prevent dirt, coal dust, etc. from the floor from washing into it.

Table of Measurements

Model	A Height of Pump		B Depth of Sump		C Diam. of Base	D Base to Motor		E Disc Pipe	F Centers for Cut-Out in Cover
	Ft.	In.	Ft.	In.	Inches	Ft.	In.	Inches	Inches
A	3	3	2	0	9¼	2	3½	1	6⅝
B	3	3	2	0	9⅝	2	7	1¼	6⅝
C	4	3	3	0	9⅝	3	9	1¼	6⅝
D	5	3	4	0	9⅝	4	7	1¼	6⅝
E	7	3	6	0	9⅝	6	7	1¼	6⅝
F	9	3	8	0	9⅝	8	7	1¼	6⅝

IMPERIAL SUMP COVERS



These sump covers are quickly assembled, and give complete protection to the sump. The holes admitting the shaft tube, electrode cords and discharge pipe allow ample clearance. Covers furnished to fit standard sewer crock sumps from 15 in. to 24 in. Dimensions and list prices shown below.

No.	Size Crock, Inches	Outside Diameter, Inches	Shipping Weight, Pounds	List Price
1	15 to 18	19¾	28	$ 8.50
2	21 to 22	24	47	12.00
3	24	27½	58	15.00

Special mountings for suspending pump on cover can be supplied when unusual conditions make this necessary.

Availability—Literature—Imperial Sump Pumps are sold and stocked by leading plumbing and heating jobbers. For complete data on Imperial "Floatless" Automatic Electric Sump Pumps, write for Catalog 438.

MEMORANDA

MICRO-WESTCO, INC.

Pumps for Handling Commercial Liquids, for Circulating and General Service

2103 State Street, BETTENDORF, IOWA

BRANCHES

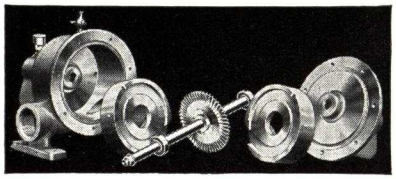
NEW YORK, N. Y. PHILADELPHIA, PA. CHICAGO, ILL. LOS ANGELES, CAL. SAN FRANCISCO, CAL.

DISTRIBUTORS IN 100 PRINCIPAL CITIES

Westco's Turbine Principle of Pumping

During its travel from suction to discharge, liquid is recirculated a great many times through the vanes of Westco's Impeller. Each vane imparts its proportional share of energy to the liquid. This enables Westco to operate against high pressures in single-stage (that is, with only one impeller) that would require multi-stage construction (more than one impeller) in the conventional centrifugal pump.

Liquid always circulates through the vanes a sufficient number of times to pump against the existing head. Consequently when the head varies, the number of circulations also varies. Thus, Westco automatically adjusts itself to changes in the operating conditions.



Patented Removable Liner Feature of All Westco Turbine Pumps

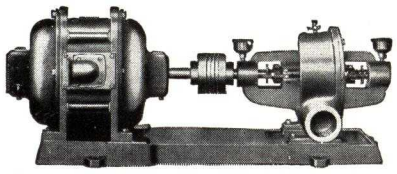
Note Turbine-type Impeller and Heavy Casings

Patented Removable Liners

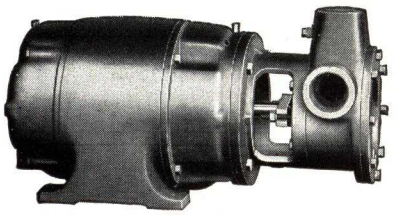
An exclusive Westco Feature. These patented Removable Liners (see cut above) form the liquid channels. They safeguard casings against corrosion by furnishing protection where velocity of liquid is greatest. Interchangeability of these Liners permits easy, quick variation of pump capacity.

In case of foreign materials entering the pump, any damage would necessarily occur to the Liners and *not* the casings. So, if this ever happens, the pump can be completely reconditioned by simply replacing the Liners and, possibly, the Impeller.

These parts are not expensive so an extra set carried on hand gives Westco users all the advantages of an auxiliary or stand-by pump at about one-fourth the usual cost.



Westco Turbine Pump, Flexible Coupling Type



Westco Uni-Bilt Turbine Pump

Especially designed for Air Conditioning and Refrigerating Applications. Ideal for circulating hot water.

Has all Westco features including Removable Liners. Self-priming models available. Sizes from 5 to 100 g.p.m. against heads up to 150 ft. depending upon capacity desired.

181J

Westco
PUMPS AND WATER SYSTEMS

Westco Products

SINGLE-STAGE, DOUBLE-SUCTION TURBINE PUMPS for low or high head duty; CONDENSATION PUMPS and RECEIVERS; DOUBLE-SUCTION, SELF-PRIMING TURBINE PUMPS; TURBINE PUMPS with Gasoline Engine Drive; AUTOMATIC WATER SYSTEMS; REFRIGERATING PUMPS for Brine or Water Circulation; UNDERWRITERS' LABORATORY-APPROVED TANK FILLING PUMPS for Sprinkler, Gravity and Pressure Tank Supply.

Westco Turbine Centrifugal Pumps

For house and booster service, brine and drinking water circulation, hot water circulation, boiler feed, elevators, cooling tower supply, air conditioning, sprinkler, tank filling, etc.

Westcos are highly efficient while pumping small capacities against high heads. Power consumption decreases as head decreases. Variations in head affect capacity only slightly.

Impeller is Westco's only moving part. It operates without metal-to-metal contact. Stainless steel impeller shaft mounted on two out-board ball bearings. Casings allow disassembly without disturbing piping connections.

Perfect hydraulic balance achieved by double-suction intake design. Compactly and ruggedly built. Sizes from 5 to 400 g.p.m. against heads up to 1,000 ft. Write for Architect's Specifications and Performance and Selection Tables.

Westco Condensation Pumps and Receivers

Used with radiation systems, heaters, steam coils, etc., for returning hot condensate to high or low pressure steam plants. Saves large volumes of water and considerable fuel. Induces proper circulation.

Equipped with bronze-fitted, double-suction Westco Turbine Pump. Steel plate tank, galvanized inside and outside.

Easy to clean. Operates efficiently against 50% variations (either way) in head. Handles large volumes of steam or air, thus eliminating air or vapor binding of pump. Extremely compact. Quiet.

Enclosed float control switch meets Underwriters' requirements. Piping and fitting between pump and tank are furnished.

Sizes for service on layouts with 2,000 to 50,000 sq. ft. radiation surface, requiring from 4 to 400 g.p.m. against heads up to 1,000 ft. Certified blueprints, Architect's Specifications, Performance and Selection Tables, on request.

Westco Automatic Water Systems

For suburban and farm homes, institutions, golf courses, greenhouses, schools, dairies, booster service, etc. 100% automatic and self-priming. Has bronze-fitted, double-suction pump. Quiet operation. Lubricate annually. Capacity can be increased or decreased without disturbing installation. Removable liners protect casings from possible wear due to foreign matter.

28-ft. suction lift. No water-hammer or pounding in pipes. Automatic air volume control prevents water-logging of tank. Sizes from 250 to 3,000 g.p.h. Gasoline engine drive if desired. Special Water System Catalog on request.

Detailed Information on Westco Products

Certified blue prints, Specifications, Performance Tables gladly sent upon request. For prices, please give: (1) Specific Gravity and kind of liquid, (2) Gallons per minute, (3) Head in ft. or Pressure in lbs., (4) Source of liquid supply, (5) Power available.

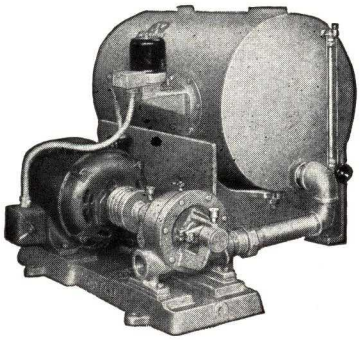
Well Water for Cooling

Well water provides the lowest cost type of cooling and dehumidifying. Expensive equipment is not required where a well can be obtained in which water will stand within 25 ft. of the surface, and in which the temperature of the water does not exceed 55° F.

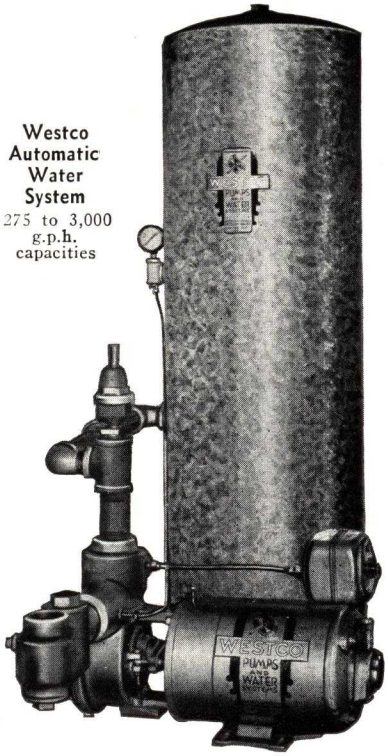
One type of installation of this kind includes: a filter to clean the air; a closed coil placed in an air duct through which the cold water is pumped; a blower to promote the circulation of air through the coil; thermostat which automatically controls the room temperature.

Temperature can be lowered as much as 15° F. with this kind of an installation. Humidity is reduced by condensation of the moisture on the coils.

Specific recommendations gladly furnished upon request.



Westco Condensation Pump and Receiver



Westco Automatic Water System

275 to 3,000 g.p.h. capacities

THE F. E. MYERS & BRO. COMPANY

ASHLAND, OHIO

Products

WELL, HOUSE and CISTERN PUMPS; SELF-OILING SHALLOW and DEEP WELL POWER PUMPS; HAND and POWER WATER SYSTEMS; SUMP PUMPS; PUMPING JACKS; TANK PUMPS; CYLINDERS; HAND and POWER SPRAY PUMPS; NOZZLES and ACCESSORIES.

TRADE-MARK

Also Hay and Grain Unloading Tools, Barn and Garage Door Hangers, Store Ladders, etc.

Catalog and complete information on request furnished for any of above.

Fig. 3012

The Myers Self-Oiling Home Water System—Fig. 3012

With Complete Automatic Control and Overload Protection

Designed for operation from any kind of city current or from farm lighting and power systems for use in cisterns or shallow wells up to 22 ft. in depth. Floor space, Nos. 1906AT and 1909AT is 25 x 33 x 35 in. high; for Nos. 901AT and 902AT is 25 x 30 x 51 in. high.

Operation is controlled by an electric switch with overload protection which automatically starts the pump when the pressure in the tank falls to 20 lbs. and stops the pump when the pressure reaches 40 lbs. The pressure is always maintained between these two points. The air supply in the tank is automatically controlled by special air valve. All working parts are automatically lubricated by oil splash from the crank case.

Tank is galvanized iron, electric welded; size, for Nos. 1906AT and 1909AT is 20 x 32 in. and for Nos. 901A and 902AT is 16 x 48 in., 42-gal. capacity. Furnished without tanks when desired.

Motors are of the repulsion and induction type, with extra high starting torque.

Pump No.	Capacity, gal. per hour	Motor		Suction, in.	Discharge, in.	Tank, galvanized	Weight, lbs.
		Hp.	Current				
1906AT	250	⅙	A-c.	¾	¾	42	239
1909AT	340	¼	A-c.	1	¾	42	245
901AT	500	½	A-c.	1¼	1	42	307
902AT	750	¾	A-c.	1¼	1	42	317

The above water systems are complete with motor, tank, vacuum chamber, relief valve, air valve, pressure control switch, automatic air and water volume control valve, endless V-belt and connecting fittings. Stainless steel piston rod.

The Myers Deep Well Water System—Fig. 2700—V-Belt Drive—9-inch Stroke

With Complete Automatic Control and Overload Protection

This system is composed of the Myers Self-Oiling Working Head with motor mounted on gear case, connected to a 42-gal. galvanized tank. The air is supplied by the air cylinder and is controlled by the automatic air control feature which eliminates air bound or water logged tanks. The water is pumped direct into the tank and the air is supplied by the air cylinder through the water line between pump and tank.

This Myers System is also an ideal unit for summer air cooling of homes, stores, etc. with well water. Low price and low operating cost. Ask our Engineering Department.

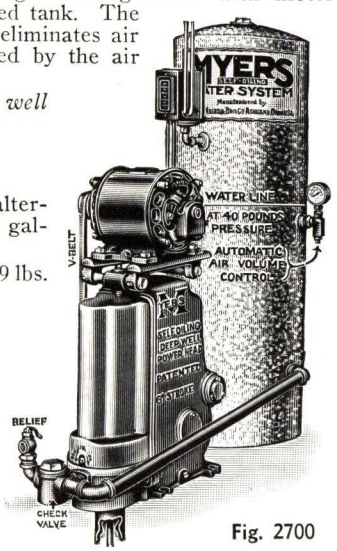


Fig. 2700

Specifications—Fig. 2700—9-Inch Stroke

No. V2950AMT—Complete as shown, including ½-hp., 110-220-volt, 60-cycle, single phase, alternating current motor, V-belt, pressure gauge, air control, electric switch, relief valve and 42-gal. galvanized tank. (Cylinder not included). Weight 384 lbs.

No. V2950AMTS—Same as No. V2950AMT, except with 4-ft. anti-freezing set length. Weight 339 lbs.

Either of above systems is furnished without tank, or equipped with larger size tanks if desired; also equipped with ⅓, ¾ or 1-hp. motor when specified. When ordered, stuffing box instead of plunger tube will be furnished. Working barrel or cylinder not included.

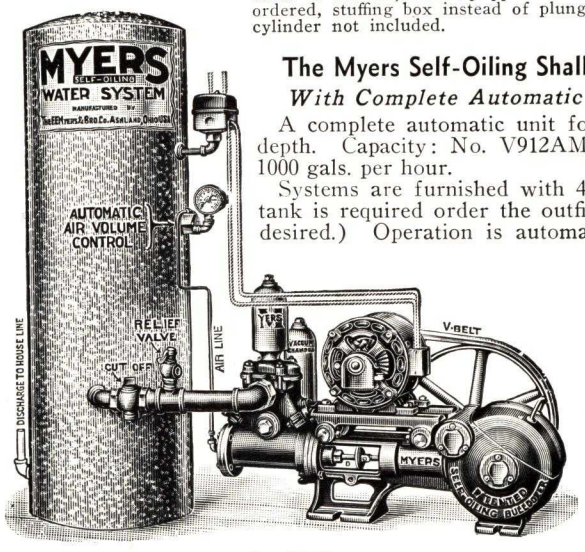


Fig. 2631

The Myers Self-Oiling Shallow Well Water System—Fig. 2631

With Complete Automatic Control and Overload Protection

A complete automatic unit for shallow wells not to exceed 24 ft. in depth. Capacity: No. V912AMT, 500 gals. per hour; No. V913AMT, 1000 gals. per hour.

Systems are furnished with 42-gal. galvanized tanks. (Where larger tank is required order the outfit less the tank and install any size tank desired.) Operation is automatic and with a variation of 20 lbs. between low and high pressure needs no attention, excepting to replenish the oil every three or four months.

Specifications—Fig. 2631

No. V912AMT—V-belt drive, complete as shown in Fig. 2631, including No. 912AM 2½x3-in. pump, ½-hp., 110-220-volt, 60-cycle, single phase, alternating current motor, automatic air and water control valve, pressure gauge, electric switch, 42-gal. galvanized tank, relief valve, cut-off and connecting pipe. Weight 369 lbs.

No. V913AMT—As above, with No. 913AM 3x4-in. pump, 1-hp., 110-220-volt, 60-cycle, single phase alternating current motor. Weight 583 lbs.

Either of above systems furnished without tanks, or equipped with larger size tanks if desired.

Note: If frequency and voltage are other than specified on this page, there will be an extra charge. Specify current used. If alternating current give phase, frequency and voltage. If direct current give voltage.

Meyers Self-Oiling Water Systems—Fig. 3013 with 12-Gallon Galvanized Tanks

With Complete Automatic Control and Overload Protection

This direct shallow well water system with overload protection is automatically controlled, and has a real range of usefulness without the disadvantages of too frequent starting and stopping and excessive wear and tear on pump, motor and switch. Ideal for small homes, summer cottages, filling stations and numerous other places where economical and dependable service is required. Pressure range is 20 to 40 lbs. Air supply in tank is controlled by automatic air volume control. Floor space 25x25x27 ins. high. Furnished complete in three sizes; 250, 340 and 500-gal. capacities.

Pump No.	Capacity, gal. per hour	Motor		Suction, in.	Discharge, in.	Tank, galvanized	Weight, lbs.
		Hp.	Current				
1927AM	250	⅙	A-c.	¾	¾	12 gal.	156
1928AM	340	¼	A-c.	1	¾	12 gal.	179
929AM	500	½	A-c.	1¼	1	12 gal.	219

Foot valve, with brass gauze strainer, for any of above systems furnished when ordered.

Above water systems are complete with motor, vacuum chamber, relief valve, pressure control and flexible copper connection between pump and tank. Stainless steel piston rod.

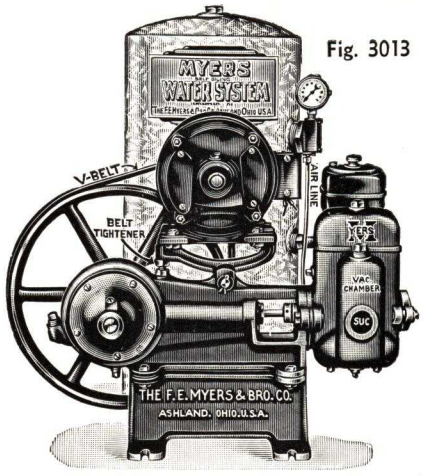


Fig. 3013

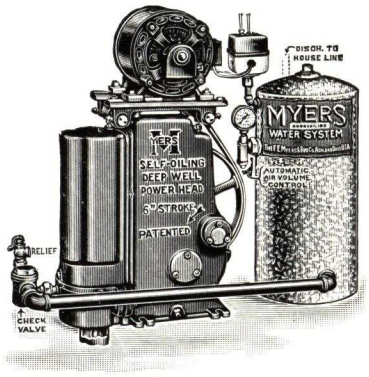


Fig. 2741

Myers Deep Well Direct Water Systems—Fig. 2741—V-Belt Drive

With Complete Automatic Control and Overload Protection

A practical deep well direct water system composed of the Myers Self-Oiling Deep Well Power Pump, motor, and 12-gal. tank which affords a sufficient cushion to eliminate the very objectionable feature of too frequent starting and stopping. It is completely automatic with overload protection. Self-starting, self-stopping, self-oiling. Air volume in tank is controlled by automatic air control. Furnished only in 6-in. stroke size. Floor space 16x40x33 ins. high. Ideal for use wherever fresh water is desired from a deep well or other source. Easy to install. Economical to operate. Dependable for service.

Specifications Fig. 2741

No. V2956AM—Complete as shown, including ½-hp., 110-220-volt, 60-cycle, single phase, altering current motor, V-belt, pressure gauge, automatic air volume control, electric switch, 12-gal. air chamber and relief valve. Weight 318 lbs.

No. V2956AMS—Same as No. V2955AM, with a 4-ft. anti-freezing set length. Weight 324 lbs.

Either of above systems is furnished with ⅓, ¾ or 1-hp. motor if desired; also equipped with stuffing box instead of plunger tube when specified on order.

Myers Shallow Well Self-Oiling Power Pumps—Fig. 2633
250 to 9000 Gallons of Water per Hour

Designed for pumping water from shallow wells or cisterns, ponds, streams, lakes or other sources of supply. Motor or engine operation. Silent chain, V-belt or direct drive. Furnished complete with motor as illustrated, or the bare pump with tight and loose pulleys, or tight pulley only and belt tightener for flat belt drive from motor or engine. Positive self-lubrication, housed working parts, machine cut gears, oversize valves, unrestricted waterways, extra large volume, freedom from wear and breakage, extended service-years. For open tank, pressure tank or other use.

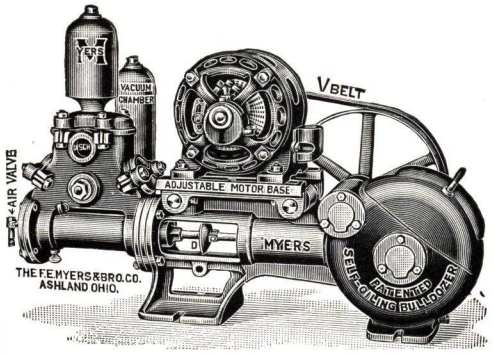


Fig. 2633

Air conditioning with well water for homes, stores, hotels, restaurants and innumerable other places is simple, practical and extremely economical to install and operate. No complicated equipment required. Installation is easy. Write our Engineering Department for reliable information.

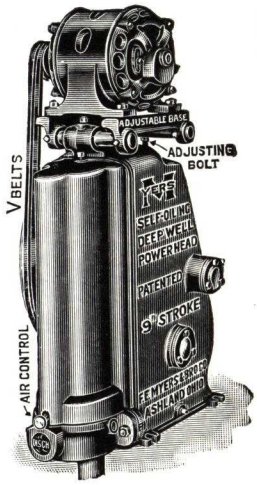


Fig. 2628

Myers Deep Well Self-Oiling Power Pumps—Fig. 2628
6, 9, 12, 18 and 24-inch Strokes

In localities where deep well service is necessary, Myers Deep Well Self-Oiling Power Pumps or Working Heads have firmly established themeslves. Their performance records under almost every conceivable condition convince critical buyers of their superiority. Styles and sizes for any service up to 8-in. drop line. With or without motors, V-belt, flat belt or silent chain drive. Also bare pumps with tight and loose pulleys for engine or tight pulley for motor. Ideal for open tank, pressure tank or other service.

Myers New Centrifugal Sump Pump—Fig. 2917

It drains when it rains. Has no equal, as far as we know, at the price for appearance, construction, durability and trouble—free performance. Furnished complete as illustrated ready for quick and easy installation.

Write our Engineering Department for complete information. New 368-page Catalog on request.

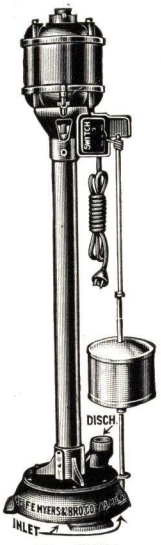


Fig. 2917

ESTABLISHED 1886

PENBERTHY INJECTOR CO.

Automatic Electric Sump Pumps and Automatic Cellar Drainers—Copper and Brass Construction Throughout

DETROIT, MICH.

CANADIAN PLANT: WINDSOR, ONTARIO

For Penberthy Hot Water Heating Specialties, see File Index

Penberthy Automatic Electric Sump Pumps

Used Wherever Water Accumulates

In spite of our efficient municipal sewerage systems, there are numerous places where water accumulates by seepage, overflow, flood or backing up, that can not be drained off directly, either because the flow line of the sewer is not deep enough or because obstacles intervene between the sump and the sewer.

Among the more common instances may be mentioned the cellars of residences where no sewers exist or where the sewer line is above the basement floor level, also deep cellars of buildings, boiler rooms, settling basins, flywheel and elevator sumps, tunnels, and scale pits.

While ordinarily this seepage may amount to only a small trickle, its flow is continuous and if neglected the accumulated water soon becomes a real menace to health and property.

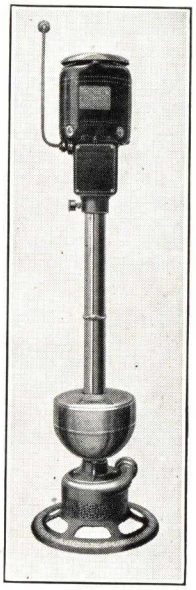
To keep such places dry, the incoming water is most economically disposed of as it accumulates, either by an automatic cellar drainer (water or steam operated) or an automatic sump pump (electrically operated). Local conditions determine which is preferable.

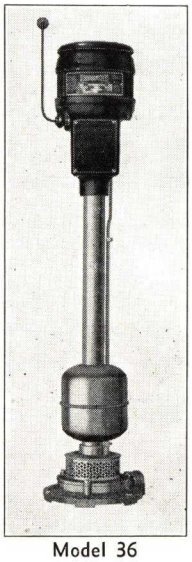
Penberthy manufactures a complete line of both types, and can consequently supply the unit best suited to meet requirements.

Conditions favoring the electric pump are:

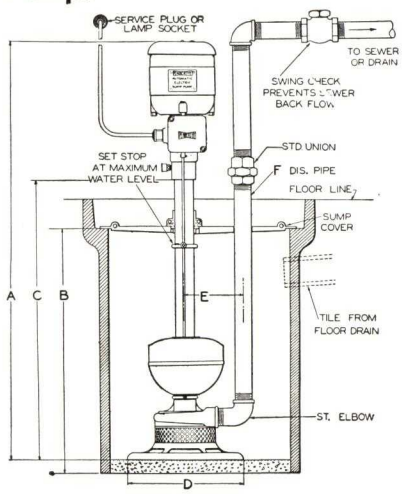
(1) For districts where city water pressure is not available, or at least very low (2) Larger quantities of seepage water to be handled. (3) Discharge heads up to 22 ft. (4) Low cost of operation.

Model K





Model 36



Installation Details

Installation—Model K and Model 36

The automatic electric sump pump is set in a floor sump which can be conveniently made by taking a piece of 15 to 24-in. sewer crock 2 ft. long. A sump cover is recommended. The pump outlet is piped to the nearest and lowest sewer or surface outlet. The motor switch cord is plugged into the nearest plug or light socket and the pump is ready for operation. Be sure that the electric current is left permanently connected to the motor switch, and that the electric current is entirely suitable to the motor furnished with the pump. General instructions accompany each pump. There are no projecting arms or delicate parts to require special supports or protection. The entire unit is simple and easily installed and operated. It meets all the requirements of the various building codes.

*Specifications—Model K Only

Motor—Not an ordinary horizontal motor turned on end, but a special motor with ball thrust bearings for vertical operation. Repulsion induction type which has better characteristics for sump pump service than other types. Motors regularly furnished are for 110 volts and 60 cycles but can be supplied for the following current characteristics at no additional cost: alternating current, 110 volts, 50 or 25 cycles; 220 volts, 60, 50, or 25 cycles; direct current, 110 volts. Motors to suit other current characteristics at slight additional cost.

Overload Protection—Fusetron unit, combining a fuse with two distinct forms of alloy melting type breaker action integrally built into motor, positively protects motor in case of improper voltages, overloading or trouble of any kind.

Mercury Switch—(Today used almost universally for automatic controls) dependable and particularly adapted to float operation; has no mechanical contacts to wear or spark, mounted in heavy bakelite box, providing complete insulation for all wiring. Switch is controlled by extra heavy copper float sliding freely on supporting column, sensitive to slightest difference in water levels, adjustable bronze ring governs water level at which pump starts.

Impeller Shaft—Bronze, fully inclosed, held to perfect alignment and supported by bearing at both ends, flexible spring coupling relieves motor shaft of sudden starting shocks.

Lubrication—All bearings that require lubrication are provided with oil or grease cups.

Material—This pump is immune to corrosion; it is made of copper and bronze throughout.

Sump Cover—A sump cover is recommended to exclude ashes, coal dust and other solid material from accumulating in sump. Penberthy Sump Pump Covers provide proper working clearances for the automatic control mechanism.

DIMENSIONS OF SUMP PUMPS

Size No.	A Height of pump, ft. in.	B Depth of sump, ft. in.	C Base to motor, ft. in.	D Diameter of base, in.	E Cent. cut-outs in cover, in.	F Discharge pipe, in.
0-36	3 4½	2 —	2 4¼	8	6	1
1K	3 7¼	2 —	2 4	11¾	6	1¼
2K	4 7¼	3 —	3 4	11¾	6	1¼
3K	5 6	4 —	4 3	11¾	6	1¼
4K	7 11	6 6	6 8	11¾	6	1¼
5K	9 10	8 6	8 7	11¾	6	1¼

LIST PRICES, SIZES AND WEIGHTS

Cover, No.	List price	Outside diameter, in.	Shipping weight, boxed, lb.
1	$ 8.50	19¾	28
2	12.00	24	47
3	15.00	27½	58

LIST PRICES, SIZES, CAPACITIES, ETC., OF PENBERTHY MODEL 36 AND MODEL K ELECTRIC SUMP PUMPS

Size No.	List prices	Pipe connection, in.	Maximum Sump depth, ft.	Height of pump ft. in	Approximate capacity, gallons per hour against discharge head of 5 ft.	10 ft.	15 ft.	20 ft.	22 ft.	Size motor, hp.	Weight boxed, lb.
0-36	$ 39.50	1	2	3 4½	1500	1500	1250	750	...	¼	57
1K	65.00	1¼	2	3 7¼	3200	2600	1900	1000	600	¼	102
2K	85.00	1¼	3	4 7¼	3200	2600	1900	1000	600	¼	115
3K	100.00	1¼	4	5 6	3200	2600	1900	1000	600	¼	128
4K	125.00	1¼	6½	7 11	3200	2600	1900	1000	600	¼	149
5K	150.00	1¼	8½	9 10	3200	2600	1900	1000	600	¼	195

*Model 36 differs in some details but also is copper and bronze throughout.

Penberthy Automatic Cellar Drainers—Water or Steam Operated

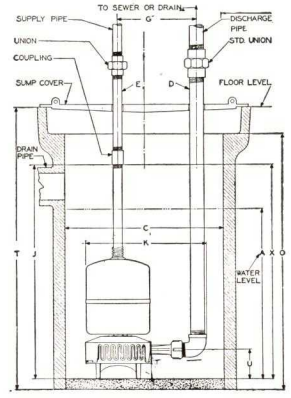
The Penberthy Automatic Cellar Drainer has been on the market for many years and is of distinct service for installations such as office buildings, residence or factory basements, sumps, tanks, settling basins, flywheel, elevator, coal and scale pits, or wherever it is desired to remove seepage, flood or backwater from point below the natural drainage level of sewer. For conditions such as these the Penberthy Automatic Cellar Drainer offers a desirable solution, as it operates by city water pressure or steam and the drainer itself is ideally constructed to occupy the least possible space. It is also entirely automatic and requires no attention after installation.

Special Notice: The capacities given are the actual capacities of water taken from sump and not the combined discharge of operating and drainage water as given in most tables. For higher elevations than shown, special drainers can be made.

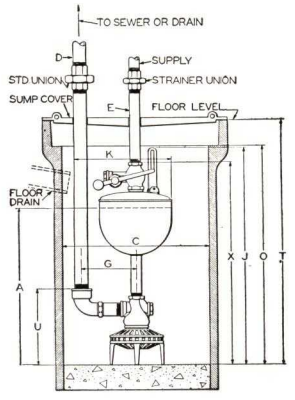
CAPACITIES AT DIFFERENT PRESSURES AND ELEVATIONS

Model	Size No.	Working Head in feet	Table of capacities from sump in gallons per hour at 10 to 150 lbs. water pressure in lbs. per square inch									
			10	15	20	30	40	60	80	100	120	150
S	0	3	80	190	280	400	510	640	690	670	650	600
		6	.....	90	140	300	390	570	670	670	650	600
		9	.....	.....	90	200	280	480	590	650	640	600
		12	.....	.....	.....	140	220	340	530	630	630	600
		15	.....	.....	.....	90	190	270	450	600	620	600
		18	.....	.....	.....	.....	120	250	320	550	610	600
R	1	3	80	210	300	400	510	700	720	700	660	600
		6	.....	90	140	300	390	570	670	690	650	600
		9	.....	.....	90	210	330	480	620	660	640	600
		12	.....	.....	.....	150	220	390	550	630	630	600
		15	.....	.....	.....	90	190	300	450	600	620	600
		18	.....	.....	.....	.....	120	250	320	550	610	600
	2	3	190	390	550	750	910	1180	1240	1220	1170	1100
		6	.....	210	340	600	750	1020	1140	1200	1130	1100
		9	.....	.....	210	380	540	900	1190	1150	1090	1100
		12	.....	.....	.....	300	420	780	1020	1110	1060	1100
		15	.....	.....	.....	210	370	570	940	1050	1030	1100
		18	.....	.....	.....	.....	300	510	850	970	1000	1100
L	3	3	.....	450	600	800	1100	1400	1600	1600	1500	1300
		6	.....	.....	400	650	860	1200	1400	1500	1450	1300
		9	.....	.....	.....	550	720	1000	1300	1400	1420	1300
		12	.....	.....	.....	.....	470	800	1000	1300	1400	1300
		18	.....	.....	.....	.....	.....	500	700	1100	1300	1300
	4	3	.....	600	800	1200	1600	2000	2400	2500	2200	2000
		6	.....	.....	550	1000	1240	1800	1900	2300	2160	2000
		9	.....	.....	.....	800	1040	1600	1800	2200	2130	2000
		12	.....	.....	.....	.....	670	1200	1400	2100	2100	2000
		18	.....	.....	.....	.....	.....	800	1000	1800	2000	2000
	5	3	.....	750	1000	1600	2100	2700	3200	3200	3100	2600
		6	.....	.....	700	1300	1620	2300	2800	3100	3000	2600
		9	.....	.....	.....	1000	1260	1900	2600	2900	2900	2600
		12	.....	.....	.....	.....	840	1500	2000	2700	2800	2600
		18	.....	.....	.....	.....	.....	1000	1500	2300	2600	2600

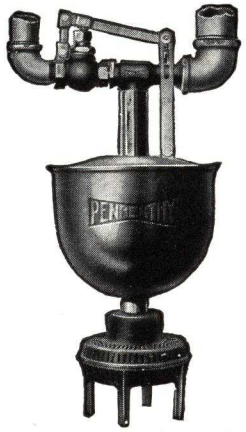
Standard Drainer Capacities are printed above black line. Five pounds or more water pressure is required for each one foot of elevation. At no additional charge special low pressure drainers can be furnished suitable for conditions below black line. Special drainers can be adjusted to operate on 2 to 4 lbs. water pressure for each one foot of elevation. To avoid delay, when ordering special low pressure drainers give operating pressure, elevation of discharge, etc.

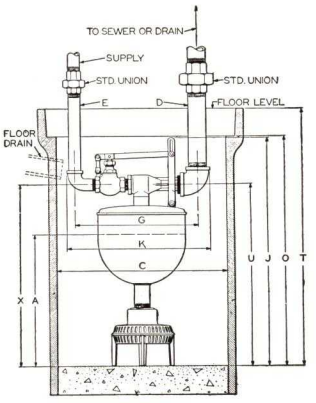


Model "S" Automatic Cellar Drainer
Size 0



Model "R" Automatic Cellar Drainer
Sizes 1 and 2





Model "L" Automatic Cellar Drainer
Sizes 3, 4 and 5

WATER CONSUMPTION

Model	Size No.	Approximate gallons pressure water per hour at pressures of 10 to 150 lbs. per square inch									
		10	15	20	30	40	60	80	100	120	150
S	0	70	90	110	130	160	190	225	250	275	300
R	1	70	90	110	130	160	190	225	250	275	300
	2	135	155	200	230	280	340	390	440	480	520
L	3	330	380	470	570	670	820	950	1060	1180	1310
	4	510	610	730	900	1040	1280	1470	1650	1790	2010
	5	740	870	1060	1300	1500	1840	2130	2380	2570	2880

PRICE LIST

	Model "S"	Model "R"		Model "L"		
Size.....	0	1	2	3	4	5
List price.....	$14.50	$25.00	$40.00	$55.00	$80.00	$110.00

DIMENSIONS OF PENBERTHY AUTOMATIC CELLAR DRAINERS

Model	Size No.	A High water, in.	C Diameter crock, in.	D Discharge I. P. diameter	E Supply I. P. diameter	G Centers of cutouts in cover, in.	K Diameter of drainer, in.	J Height of drainer valve open, in.	O Height to seat of socket, in.	T Height to floor level, in.	U Height to outlet, in.	X Height to inlet, in.
S	0	13-18	15	1	½	7½	11¾	19½	24	26½	2¾	19½
R	1	13½	15	1	½	6	10⅜	21½	21	23½	7¾	20⅜
	2	13½	15	1¼	¾	7½	12⅞	21½	21	23½	7¾	20⅜
L	3	12¾	20	1½	1	13	15⅛	25⅜	33	36	19⅜	19⅜
	4	14½	24	2	1¼	15⅞	18½	27½	33	36	20¼	20¼
	5	14½	27	2½	1½	17½	20⁹⁄₁₆	27⅝	33	36	20⅜	20⅜

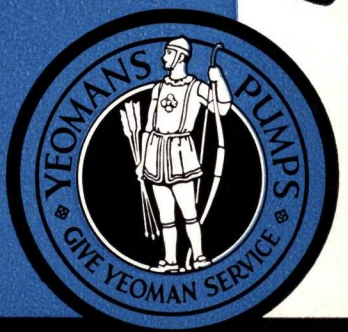
MEMORANDA

THE ARCHITECTS' AND MECHANICAL ENGINEERS' BOOK OF

YEOMANS PUMPS

FOR USE IN DRAINAGE, SEWAGE, WATER SUPPLY, CIRCULATION, BOILER FEED, CONDENSATION, AND AIR CONDITIONING

YEOMANS BROTHERS COMPANY · CHICAGO



YEOMANS BROTHERS COMPANY

MAKERS OF SEWAGE EJECTORS, PUMPING MACHINERY & AIR COMPRESSORS

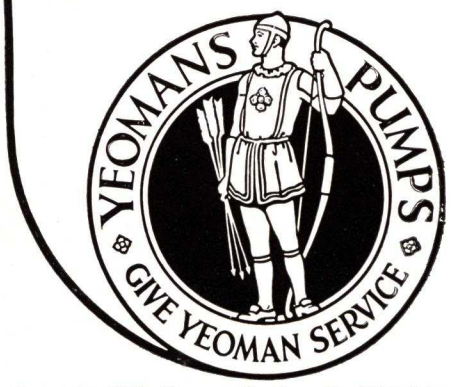
SALES AND SERVICE OFFICES

. . . for street addresses see local 'phone directory

Hall & Smith, Atlanta, Ga.
Morton McI. Dukehart & Co., Baltimore, Md.
Power Equipment Co., Boston, Mass.
J. H. Roseberry, Buffalo, N. Y.
J. R. Purser, Charlotte, N. C.
H. N. Willard, Chattanooga, Tenn.
O. J. Allonier, Cincinnati, Ohio.
Cleveland Pump & Supply Co., Cleveland, Ohio
Columbus Steam Pump Works Co., Columbus, Ohio
W. E. Lewis & Co., Dallas, Texas
D. C. Murphy Co., Davenport, Iowa
Kelso-Wagner Co., Dayton, Ohio
D. C. Murphy Co., Des Moines, Iowa
Power Plant Supply Co., Detroit, Mich.
Geo. W. Herlin, El Paso, Texas
Dakota Electric Supply Co., Fargo, N. D.
Johns Equipment Co., Fort Wayne, Indiana
R. E. DeKraker Co., Grand Rapids, Mich.
Texas Engineering Co., Houston, Texas
W. P. Whittington Co., Indianapolis, Ind.
Thos. A. Lucy, Jackson, Miss.
Forslund Pump & Machinery Co., Kansas City, Mo
C. O. Miller Co., Little Rock, Ark.
Smith Booth Usher Co., Los Angeles, Calif.
Andriot & Davidson, Louisville, Ky.
Hoshall Machinery Co., Memphis, Tenn.
C. W. Miller, Milwaukee, Wis.
Wm. H. Ziegler Co., Minneapolis, Minn.
Ryan Sales Corp., Nashville, Tenn.
Walter Castanedo, Inc. New Orleans, La.
Ralph B. Carter Co., New York City, N. Y.
C. A. Zink, Oklahoma City, Okla.
D. E. McCulley Co., Omaha, Nebr.
A. R. Amos, Jr., Philadelphia, Pa.
Bushnell Machinery Co., Pittsburgh, Pa.
Gordon & Finkbeiner, Portland, Ore.
Power Equipment Co., Richmond, Va.
General Equipment Co., Rochester, N. Y.
H. A. Grossmann Co., St. Louis, Mo.
B. H. Mueller, St. Louis, Mo.
Healy-Ruff Co., St. Paul, Minn.
Hawley-Richardson-Williams Co., Salt Lake City, Utah
R. S. Ryden, San Antonio, Texas
C. H. Cobb, San Francisco, Calif.
F. H. Godfrey Engineering Co., Seattle, Wash.
Smith-Monroe Co., South Bend, Ind.
H. L. Waterman, Inc., Syracuse, N. Y.
A. Carle Rogers, Toledo, Ohio
E. I. Van Doren Companies, Troy, N. Y.

FOREIGN REPRESENTATIVES

Buxton, Ltd., Buenos Aires
Purdy & Henderson Trading Co., Havana
Honolulu Iron Works, Honolulu, T.H.
The General Supply Co., Mexico City
C. Calor Mota, C. E. Porto Rico—Mayaguez
Darling Brothers, Ltd., Montreal, Toronto, Winnipeg
Frank Darling & Co., Vancouver, B. C.



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● THE LEADERSHIP OF YEOMANS PUMPS

Forty years of concentration upon pumping problems have built up within the Yeomans organization the knowledge, technique and engineering ability which have produced the various pumps described in this book.

Basically, all centrifugal pumps are alike and superficially simple. Apparently, any good machine shop should be able to produce them. Yet there is a wide difference between makes of pumps—a difference reflected in efficiency, life and acceptance. These differences are subtle but important. The means of achieving the best results are not so much a matter of mechanical skill as they are a matter of precision gained through long experience.

There, Yeomans excels, for Yeomans has specialized on pumps of all types. It has pioneered many of them. Today, Yeomans Pumps represent the highest development in pumping equipment. An examination of these pumps reveals refinements not to be found elsewhere—features that reflect the ingrained skill of Yeomans designers and craftsmen.

Architects and engineers the world over have endorsed and specified Yeomans equipment, and the thousands of successful installations bear eloquent testimony to Yeomans quality, experience and leadership.

● YEOMANS SERVICE TO ARCHITECTS

To aid the architect and engineer in the selection of the proper pump for any type of building, Yeomans has developed a capable service organization in 53 cities throughout the country. This organization has been an important factor in maintaining the excellent record for durability and performance of Yeomans Company pumps.

All Yeomans engineers and representatives are widely experienced in analyzing pumping problems and are able to give prompt and intelligent service. Architects and engineers place themselves under no obligation by permitting Yeomans Brothers Company or its representatives to submit suggestions regarding pumping equipment. Such service is gladly given—without cost.

● THE YEOMANS GUARANTEE

A successful pump installation depends not only on excellent workmanship, but also on thorough care in installation. Both must be of the best for maximum efficiency and reliable service. In Yeomans pumps both are assured—by skillful manufacture—by a thoroughly experienced service organization.

Yeomans Brothers Company takes full responsibility for the satisfactory operation of any Yeomans pump installed according to recommendations. The established character and integrity of the company make that responsibility valid.

YEOMANS BROTHERS COMPANY
1419 DAYTON STREET, CHICAGO, ILL.

PUMPS WHERE AND WHY THEY ARE USED

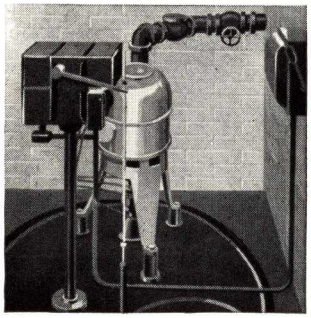
THE THREE FUNCTIONS OF PUMPS
IN BUILDING CONSTRUCTION

While there are three general pump functions, and several distinct pump types, it is the nature and size of the service rather than the design of the pump itself which decide pump selection. For example, the same pump may appropriately serve all three functions, depending on the conditions—or—three pumps may be offered for one service, again depending on the conditions. The lines are not definitely divided, yet this fact need not be confusing; this booklet makes clear the proper selection for each service.

Briefly, pump problems are divided into three groups. These are

1. Drainage and Sewage
2. Water Supply and Circulation
3. Heating Systems

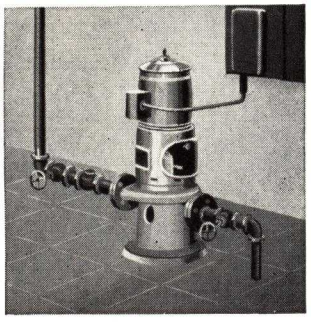
1. DRAINAGE AND SEWAGE PUMPING



Drainage pumps—called cellar drainers in the smaller sizes—also bilge or sump pumps, are used wherever it is necessary to raise floor drainage, seepage, flood or back waters from sumps, catch basins, or other points below street sewers. Wastes from showers, laundry trays, boiler blow-off—wastes which contain no appreciable solids—can be readily removed by these pump units.

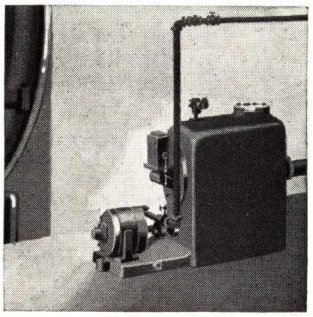
Sewage pumps—also known as ejectors—are used to elevate drainage and sewage, usually the waste from one or more water closets.

2. PUMPS FOR WATER SUPPLY AND CIRCULATION



These pumps may be classified according to their various uses.
Water Supply
Domestic hot water circulation
Drinking water circulation
Cooling water circulation
Swimming pool water circulation
Brine circulation
Air washer water circulation

3. PUMPS FOR HEATING SYSTEMS



These pumps are called condensation or return pumps. They are used to return to the boiler the steam that condenses below boiler water level. They are used in high- or low-pressure steam or vapor systems.

DRAINAGE AND SEWAGE

HANDLING OF DRAINAGE AND SEWAGE BELOW STREET SEWER LEVELS

In many localities the street sewers are small and shallow, necessitating the elevating of sewage and waste waters to the sewer, which is done only with pumps. To remove drainage, and to prevent accumulating water and waste from becoming a menace to health and property, an automatic drainer, bilge, or sump pump is installed. This pump, located in a sump or catch basin into which the waste waters drain, operates automatically, pumping the water from the sump basin to the sewer—the controls starting and stopping the electric motor as the level of the liquid rises and falls in the basin.

The process for removing sewage is identical. In this case, a sewage pump or ejector is used. It should have a non-clogging impeller designed to pump not only drainage, but also solids, such as toilet waste, mud, sand, stones, rags, etc.

PUMPS HOW TO SELECT THEM

CONTROLLING FACTORS IN PUMP SELECTION

While many charts and guides have been devised to aid in the selection of drainage and sewage pumps, the conditions alone determine the exact pump to fit a given duty. Many factors influence the decision such as

(1) The nature of the area to be drained
(2) The type of suspended matter in waste waters
(3) The distance below sewer level
(4) Extent of waterproofing in basement

A large safety factor to offset the unexpected should be included, since the safety of property and equipment may depend entirely upon the ability of the pumps to dispose of drainage and sewage. Unusual flood conditions can tax the capacity of the pump beyond its ability.

HOW TO CALCULATE THE DISCHARGE HEAD:

To arrive at the discharge head of a drainage pump or sewage ejector, measure the distance from the bottom of the sump or catch basin to the highest point in the discharge line to the sewer. Then add 1 ft. friction loss for each 20 ft. of discharge pipe. Thus, in the illustration below, the discharge head is figured as follows:

Distance A (Static head) ..... 20 ft.

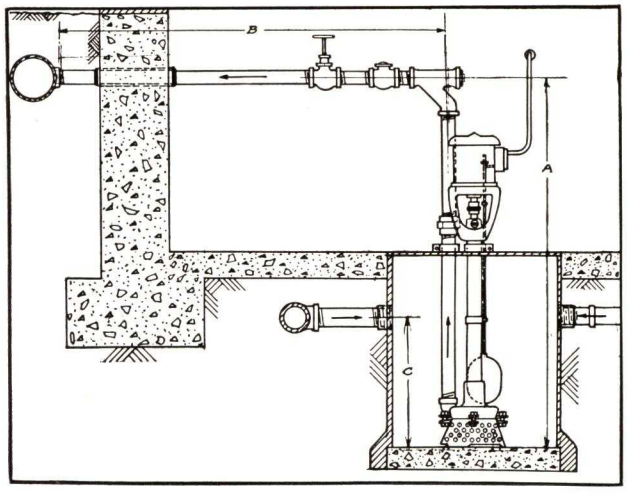
Friction loss. Length of discharge pipe (A+B) app. 40 ft. . 2 ft.

Total discharge head ..... 22 ft.

DETERMINING DEPTH OF BASIN

(SEWAGE AND DRAINAGE)

To allow ample storage of sewage, drainage, etc., provide at least 3 ft. (C) of depth below lowest inlet to the catch basin or sump. This will give reasonably long cycles of pump operation and idleness. It will eliminate too-frequent starting and stopping of apparatus, which causes unnecessary wear and reduces the life of the equipment.



THE APPROXIMATE FLOW FROM VARIOUS PLUMBING FIXTURES

(TO DETERMINE CAPACITY)

The following table gives the approximate flow in gallons per minute from various plumbing fixtures.

	per fixture
Lavatory—two ⅜ inch connections	5 GPM
Bath Tub—two ½ inch connections	8 GPM
Kitchen or Pantry sink—two ½ inch connections	5 GPM
Shower—overhead spray only—two ½ inch connections	10 GPM
Shower—with side sprays in addition to overhead spray connections	20 GPM
Slop sink—two ½ inch connections	6 GPM
Slop sink—two ¾ inch connections	10 GPM
Laundry tray—two ½ inch connections	10 GPM
Water Closet—tank type—one ⅜ inch connection	5 GPM
Water Closet—Flush Valve—one 1 inch or 1¼ inch connection	30 GPM
Urinal stall—one ⅜ inch connection	½ GPM
Drinking Fountain—one ⅜ inch connection	1 GPM
Floor Drains each	1 GPM

Drain Tile. In clay or slow-seeping ground figure approximately 1 GPM per 100 sq. ft. of area. In sand and new made ground figure at least 5 GPM. Final calculations will depend upon nature of soil and other varying conditions.

USE FACTOR FOR DIFFERENT TYPES OF BUILDINGS

Deduct percentages given below from total GPM arrived at as illustrated in the typical example below:

Schools	25%
Mercantile Buildings	40%
Hospitals	25%
Office Buildings	50%
Private Residences	60%
Hotels and Clubs	40%
Apartment Buildings and Apartment Hotels	40%

A TYPICAL EXAMPLE

Suppose that in an apartment building the basement fixtures which cannot drain directly to the street sewer consist of one slop sink (6 GPM); two laundry trays (20 GPM); two water closets (60 GPM); one shower (10 GPM); ten floor drains (10 GPM)—a total of 106 GPM. As indicated above reduce the total pumpage in the building by 40%, making a new total of 64 GPM. Adding a 50% margin of safety, we find that an ejector—because of the water closet waste—of 100 GPM capacity should be used.

Assuming that the catch basin inlet enters at 2 ft. below the floor, and that the bottom of the basin is 3 ft. below the inlet, a basin depth of 5 ft. is the solution. If the sewer is 8 ft. above the floor and friction amounts to 2 additional ft., a total head of 15 ft. must be met.

By referring to the selection charts on page 9, the proper ejector unit can easily be selected.

The same procedure applies to the selection of bilge pumps. Use the selection chart on page 7.

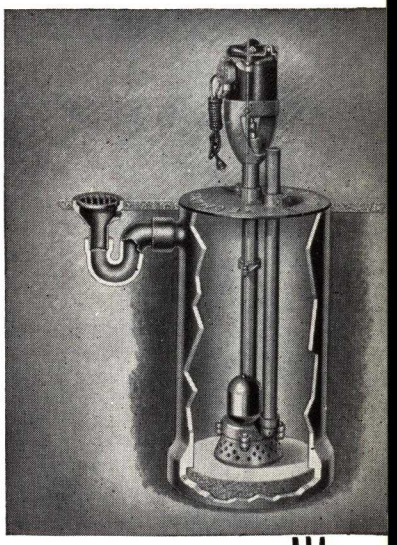
YEOMANS PUMPS FOR DRAINAGE DISPOSAL

YEOMANS "DRAIN-DRI" PUMPER

A STURDY, RUST-PROOF PUMP . . . THE KING OF ALL CELLAR DRAINERS

"DRAIN-DRI" is a trouble-proof cellar drainer that is used in garages, residences, factories, elevator pits, coal pits, or wherever it is necessary to remove a relatively small amount of drainage (up to 50-60 GPM and heads up to 20-25 ft.) from a point below the level of the sewer.

While most drainers are fundamentally alike, architects find in "Drain-Dri" a more dependable pump. Probably its greatest virtue lies in its ability to perform whenever necessity arises—day or night—year in, year out. A sticky electrical control or rusted impeller is unknown in "Drain-Dri", for the control is of the dependable industrial type, and the impeller is of the same type as is used on Yeomans sewage ejectors or sewage pumps.



HERE'S HOW IT OPERATES

As the drainage in the sump or basin rises, it lifts the hard rubber float. When drainage has accumulated in the basin to a predetermined level, the float switch automatically starts the motor and pump. As the drainage is pumped out of the basin, the float descends with the falling level of drainage, automatically opening the control switch until the basin has again filled with drainage.

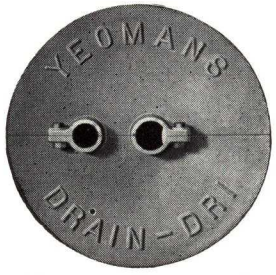
YEOMANS "ADJUSTO" SPLIT CAST IRON COVER

"Drain-Dri" units can be installed in cast iron, steel, concrete, tile, or brick catch basins. Where required by local ordinances, "Drain-Dri" can be furnished with "Adjusto" split cast iron cover. Cover is readily removable without interference to discharge pipe or drainer, permitting easy access to pump and pit.

"Adjusto" covers are available for sump diameters of 18", 20", 24", 30" and 36", for all units listed.

"Drain-Dri" with "Adjusto" cover is known as Model "Y".

"Drain-Dri" without "Adjusto" cover is known as Model "B". All sizes of this type will fit in sump as small as 12" in diameter.



Used on Model "Y" only

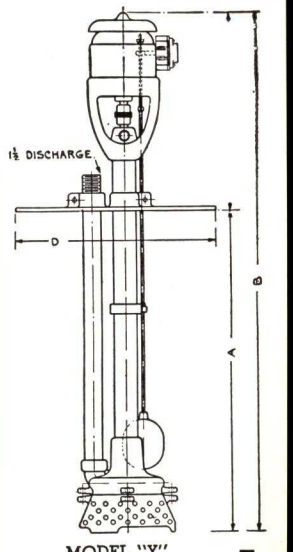
FEATURES OF THE "DRAIN-DRI" DRAINER:

MOTOR: A guaranteed ball bearing capacitor type motor operates the "Drain-Dri". It runs without radio interference, is brushless, quiet and enclosed for moisture protection. **CONTROL:** Cutler-Hammer enclosed, heavy duty float switch with hand reset overload relay. Operates even after long neglect. **PUMP BEARINGS:** Grease lubricated ball-thrust type, easily removable. Also a sealed self-lubricated sleeve bearing is easily removable. **CORD AND PLUG:** Belden cord, unbreakable soft rubber plug. **SHAFT:** Extra large, of polished steel. **COUPLING:** Lovejoy flexible, assuring vibrationless operation. **FLOAT:** Polished, sealed hard rubber, waterproof and acidproof. **SCREEN:** Rustless, galvanized cast iron, not of easily damaged wire mesh. **IMPELLER:** An outstanding feature. Is hand-finished, balanced, non-clogging type, not the little paddle wheel found in most drainers. Delivers more gallons with less power. See tables. **WEIGHT:** Weight indicates value. "Drain-Dri" is the heaviest drainer made. **RUST RESISTANCE:** Hot dipped galvanized body, hard rubber float, sealed shaft, enclosed motor.

DIMENSIONS APPLY TO BOTH MODEL "B" AND MODEL "Y"

Head in Feet	Max. Gals. per Hour Capacity		Size and No.		Normal Sump Depth-Ft.	*Dimension "A" Max. Sump Depth	Dimension "B" Height of Pump		Dimension "D" Diameter of "Adjusto" Cover	Size Discharge Connection In.
	¼ HP Unit	½ HP Unit	¼ HP Unit	½ HP Unit			¼ HP Unit	½ HP Unit		
5	3400	5200	D 2	SD 2	2	2′ 4″	3′11″	4′1″	Determined by diameter of sump. Available in 20″, 22″, 28″, 34″ and 40″ sizes.	1½
8	3200	5000	D 3	SD 3	3	3′ 4″	4′11″	5′1″		1½
10	3100	4800	D 4	SD 4	4	4′ 4″	5′11″	6′1″		1½
12	2900	4650	D 5	SD 5	5	5′ 6″	7′ 1″	7′3″		1½
15	2500	4350	D 6	SD 6	6	6′ 6″	8′ 1″	8′3″		1½
18	1800	3800	D 7	SD 7	7	7′ 8″	9′ 3″	9′5″		1½
20	1200	3500	D 8	SD 8	8	8′ 8″	10′ 3″	10′5″		1½
22	600	3000	D 9	SD 9	9	9′ 8″	11′ 3″	11′5″		1½
25		2200	D10	SD10	10	10′10″	12′ 5″	12′7″		1½
28		1200	D11	SD11	11	11′10″	13′ 5″	13′7″		1½
30		600	D12	SD12	12	12′10″	14′ 6″	14′7″		1½

*Dimensions apply to both ¼ and ½ H.P. Units.

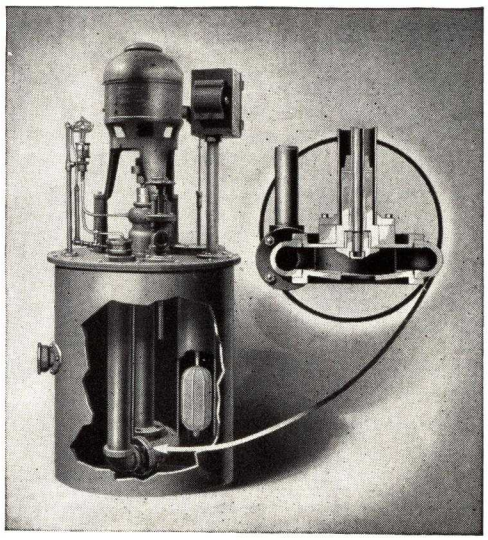


MODEL "Y" with "Adjusto" Cover

YEOMANS PUMPS FOR SEWAGE DISPOSAL

YEOMANS SCREENLESS SEWAGE EJECTORS

ENDORSED BY ARCHITECTS AND ENGINEERS THE WORLD OVER



SINCE 1898 Yeomans has specialized in the building of centrifugal pumps for sewage and heavy liquid disposal. That these pumps have given dependable, efficient service is proven by Yeomans acceptance the world over.

Yeomans Screenless Ejectors are widely used in deep basements, disposal works and industrial plants. A common application is in the pumping of liquids containing solids, etc. Unlike suction-type sewage pumps, Yeomans Submerged Screenless Ejectors handle high temperature liquids.

SINGLE AND DUPLEX INSTALLATIONS

Yeomans Screenless Sewage Ejectors are built for single or duplex installations. In the duplex ejectors, the control is so arranged that if one unit fails to handle the inflow, the other unit will cut in automatically, and in the event of inflow exceeding the capacity of one unit, the combined capacities of both units will be delivered.

EXTRA EQUIPMENT

Yeomans Screenless Sewage Ejectors can be furnished with extra equipment that increases the life of the pump. This extra equipment is briefly described on page 7. Additional information will gladly be sent on request.

HOW THE SCREENLESS EJECTOR OPERATES

This unit consists of a centrifugal non-clogging ejector located near the bottom of the sump or catch basin, and directly connected to a vertical shaft, enclosed in a suspension pipe, to an electric motor mounted on the sump cover.

As the basin fills with drainage and sewage, the copper float automatically rises. (See illustration.) The float operated automatic starter controls the starting and stopping of the motor—the pump functioning in accordance with the rise and fall of liquid in the basin.

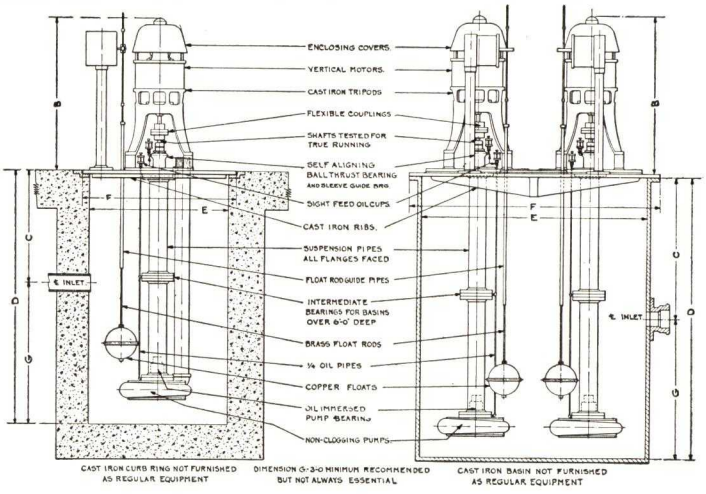
FEATURES

All of the features listed on page 6 under Yeomans Heavy Duty Bilge Pumps also apply to Yeomans Screenless Sewage Ejectors. Note, too, the following additional features:

Impeller: Yeomans 2-blade non-clogging impeller will readily pass rags and solids. This feature results from a design embodying unusual blade width, large water passages and rounded forward blade ends. There are but two waterways in this impeller and no hubs or vanes to obstruct the entrance—thus eliminoting a common source of trouble found in ordinary centrifugal pumps.

No inlet check valves: These ejectors are capable of continuous rated capacity because there is no stoppage of inflow into basin while pumps are operating. No screens are required on inlets to basin, ejector casings or in discharge piping, thus assuring freedom from clogging

Note: Yeomans self-priming device is available for all horizontal pumps operating with a suction lift.



DIMENSIONS

Ejector Number	Size Discharge A	B Approx.	C	D	SINGLE E	SINGLE F	SINGLE Bolt* Holes	SINGLE Dia. Bolt Circle	DUPLEX E	DUPLEX F	DUPLEX Bolt* Holes	DUPLEX Dia. Bolt Circle
8415 to 8435	4″	48″	Determined By Depth of Drains		36″	40″	4-⅝″	38″	48″	54″	4-⅝″	51″
8515 to 8535	5″	51″			48″	54″	4-⅝″	51″	60″	65″	4-¾″	63″
8625 to 8635	6″	54″			48″	54″	4-⅝″	51″	60″	65″	4-¾″	63″

*Bolt Holes Drilled ⅛″ Larger Than Bolts

YEOMANS PUMPS FOR SEWAGE DISPOSAL

TYPICAL SPECIFICATION

SCREENLESS SEWAGE EJECTOR

SEWAGE EJECTOR: Furnish and install where indicated on plans, one Yeomans No. ..... Single (or Duplex) Automatic Screenless Sewage Ejector having a capacity of ..... G.P.M. (for duplex set add ..... each unit) against a head of ..... feet.

MOTOR: Ejector shall be directly connected to..... H.P. vertical ball bearing motor operating at not over.....R.P.M. and suitable for.....current .....volts.....phase.....cycle.

AUTOMATIC CONTROL: Automatic control equipment shall consist of enclosed float switch and an enclosed safety switch, mounted on pipe stand on basin cover, and shall include fuses, phase protective device for polyphase motor and across-the-line type or resistance starter if size of motor requires it. Float switch shall be actuated by heavy copper float with guided brass rod. (For duplex installations add.....and Yeomans sequence changer.)

COVER PLATE: Catch basin cover shall be gas tight and suitable for basin opening of.....inches in diameter. Provide flanged opening in cover for vent and 11"x15" manhole with cast iron cover.

WIRING: Power wires will be brought to outlet within 10 feet of pump location by another contractor. All connections from this point to be made by contractor installing pump.

EXTRA EQUIPMENT: If extra equipment is desired it should be individually called for in the specifications.

DUPLEX INSTALLATIONS: Specifications for duplex Ejectors same as for Single Ejector. Note exception below:

COVER PLATE: Main catch basin cover shall be gas tight and suitable for opening.....inches in diameter, with separate ejector suspension plates with surfaces for motor supports and bearings, and suspension pipes shall be so arranged that one unit may be removed without disturbing the other. Provide flanged opening in cover for vent and 11"x15" manhole with cast iron cover.

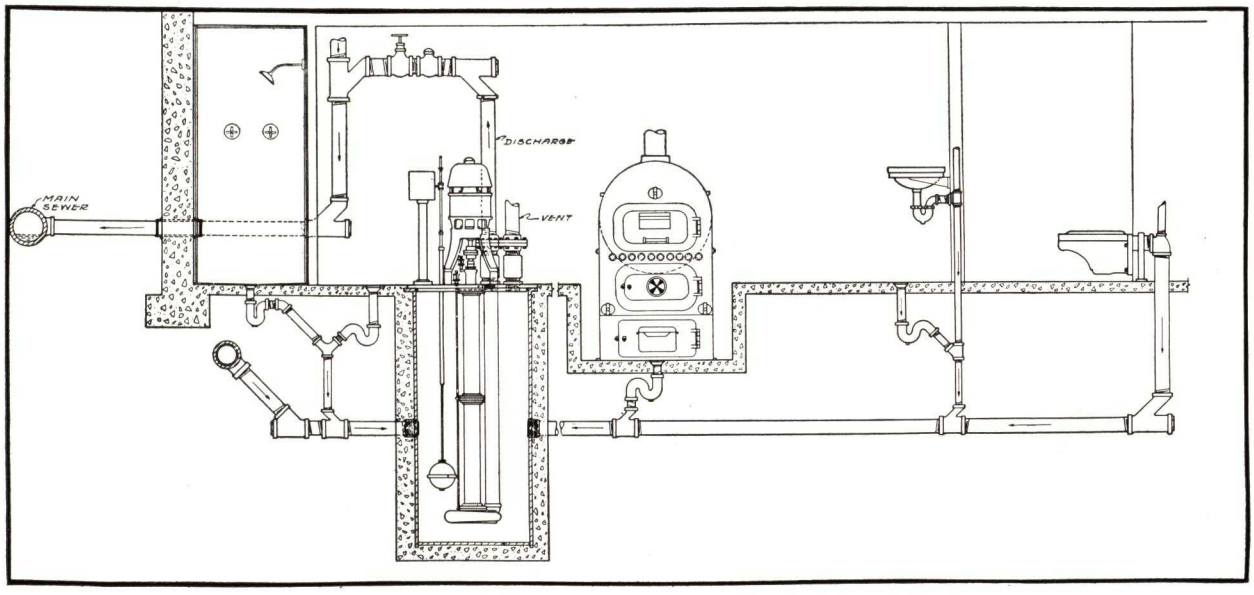
SCREENLESS EJECTOR SELECTION TABLE—1150 R.P.M.

Selection table below gives Pump No., Model Code Word and Horsepower of Motor required.

Pump Cap. G.P.M.	Discharge Size	TOTAL HEAD IN FEET										
		10	15	20	25	30	35	40	45	50	60	75
75	4"	8415 YBCEA ¾ H.P.	8415 YBCEB 1 H.P.	8425 YBCEC 1½ H.P.	8425 YBCED 2 H.P.	8425 YBCEE 3 H.P.	8425 YBCEF 3 H.P.	8425 YBCEG 5 H.P.	8425 YBCEH 5 H.P.	8435 YBCEI 5 H.P.	8435 YBCEIJ 7½ H.P.	8435 YBCEK 10 H.P.
100	4"	8415 YBCFA ¾ H.P.	8415 YBCFB 1 H.P.	8425 YBCFC 1½ H.P.	8425 YBCFD 2 H.P.	8425 YBCFE 3 H.P.	8425 YBCFF 3 H.P.	8425 YBCFG 5 H.P.	8425 YBCFH 5 H.P.	8435 YBCFI 5 H.P.	8435 YBCFJ 7½ H.P.	8435 YBCFK 10 H.P.
125	4"	8415 YBCGA ¾ H.P.	8415 YBCGB 1 H.P.	8425 YBCGC 1½ H.P.	8425 YBCGD 2 H.P.	8425 YBCGE 3 H.P.	8425 YBCGF 5 H.P.	8425 YBCGG 5 H.P.	8425 YBCGH 5 H.P.	8435 YBCGI 7½ H.P.	8435 YBCGJ 7½ H.P.	8435 YBCGK 10 H.P.
150	4"	8415 YBCHA ¾ H.P.	8415 YBCHB 1½ H.P.	8425 YBCHC 2 H.P.	8425 YBCHD 2 H.P.	8425 YBCHE 3 H.P.	8425 YBCHF 5 H.P.	8425 YBCHG 5 H.P.	8435 YBCHH 5 H.P.	8435 YBCHI 7½ H.P.	8435 YBCHJ 7½ H.P.	8435 YBCHK 10 H.P.
175	4"	8415 YBCIA ¾ H.P.	8415 YBCIB 1½ H.P.	8425 YBCIC 2 H.P.	8425 YBCID 3 H.P.	8425 YBCIE 3 H.P.	8425 YBCIF 5 H.P.	8425 YBCIG 5 H.P.	8435 YBCIH 7½ H.P.	8435 YBCII 7½ H.P.	8435 YBCIJ 10 H.P.	8435 YBCIK 15 H.P.
200	4"	8415 YBCJA 1 H.P.	8425 YBCJB 1½ H.P.	8425 YBCJC 2 H.P.	8425 YBCJD 3 H.P.	8425 YBCJE 3 H.P.	8425 YBCJF 5 H.P.	8425 YBCJG 5 H.P.	8435 YBCJH 7½ H.P.	8435 YBCJI 7½ H.P.	8435 YBCJJ 10 H.P.	8435 YBCJK 15 H.P.
225	4"	8415 YBCKA 1 H.P.	8425 YBCKB 1½ H.P.	8425 YBCKC 2 H.P.	8425 YBCKD 3 H.P.	8425 YBCKE 5 H.P.	8425 YBCKF 5 H.P.	8425 YBCKG 5 H.P.	8435 YBCKH 7½ H.P.	8435 YBCKI 7½ H.P.	8435 YBCKJ 10 H.P.	8435 YBCKK 15 H.P.
250	5"	8515 YBCLA 1 H.P.	8525 YBCLB 1½ H.P.	8525 YBCLC 3 H.P.	8525 YBCLD 3 H.P.	8525 YBCLE 5 H.P.	8525 YBCLF 5 H.P.	8525 YBCLG 5 H.P.	8535 YBCLH 7½ H.P.	8535 YBCLI 7½ H.P.	8535 YBCLJ 10 H.P.	8535 YBCLK 15 H.P.
275	5"	8515 YBCMA 1½ H.P.	8525 YBCMB 2 H.P.	8525 YBCMC 3 H.P.	8525 YBCMD 3 H.P.	8525 YBCME 5 H.P.	8525 YBCMF 5 H.P.	8525 YBCMG 5 H.P.	8535 YBCMH 7½ H.P.	8535 YBCMI 7½ H.P.	8535 YBCMJ 10 H.P.	8535 YBCMK 15 H.P.
300	5"	8515 YBCNA 1½ H.P.	8525 YBCNB 2 H.P.	8525 YBCNC 3 H.P.	8525 YBCND 5 H.P.	8525 YBCNE 5 H.P.	8525 YBCNF 5 H.P.	8535 YBCNG 7½ H.P.	8535 YBCNH 7½ H.P.	8535 YBCNI 7½ H.P.	8535 YBCNJ 10 H.P.	
350	5"	8525 YBCPA 1½ H.P.	8525 YBCPB 2 H.P.	8525 YBCPC 3 H.P.	8525 YBCPD 5 H.P.	8525 YBCPE 5 H.P.	8525 YBCPF 5 H.P.	8535 YPCPG 7½ H.P.	8535 YBCPH 7½ H.P.	8535 YBCPI 10 H.P.	8535 YBCPJ 15 H.P.	
400	6"	8625 YBCRA 2 H.P.	8625 YBCRB 3 H.P.	8625 YBCRC 3 H.P.	8625 YBCRD 5 H.P.	8625 YBCRE 5 H.P.	8635 YBCRF 7½ H.P.	8635 YBCRG 7½ H.P.	8635 YBCRH 7½ H.P.	8635 YBCRI 10 H.P.	8635 YBCRJ 15 H.P.	
500	6"	8625 YBCTA 3 H.P.	8625 YBCTB 5 H.P.	8625 YBCTC 5 H.P.	8625 YBCTD 5 H.P.	8635 YBCTE 7½ H.P.	8635 YBCTF 7½ H.P.	8635 YBCTG 7½ H.P.	8635 YBCTH 10 H.P.	8635 YBCTI 15 H.P.	8635 YBCTJ 15 H.P.	
600	6"	8635 YBCUA 3 H.P.	8635 YBCUB 5 H.P.	8635 YBCUC 5 H.P.	8635 YBCUD 7½ H.P.	8635 YBCUE 7½ H.P.	8635 YBCUF 7½ H.P.	8635 YBCUG 10 H.P.	8635 YBCUH 10 H.P.	8635 YBCUI 15 H.P.	8635 YBCUJ 15 H.P.	

The above table shows only a representative group of Yeomans Screenless Sewage Ejectors. Other standard units are furnished in larger or smaller sizes at 850, 1150, 1450 and 1750 R. P. M. (Higher or lower motor speeds are available as special equipment.)

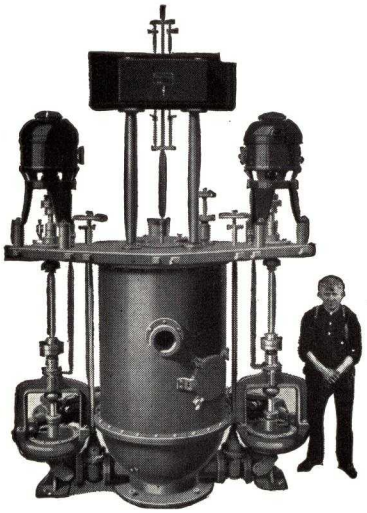
● TYPICAL BASEMENT DIAGRAM WITH DRAINAGE AND SEWAGE CONNECTIONS



YEOMANS PUMPS FOR SEWAGE DISPOSAL

YEOMANS FORM "A" DUPLEX SCREENLESS EJECTOR

A COMPLETE SEWAGE PUMPING PLANT



Form "A"—Screenless Centrifugal Sewage Ejector

Form "A" ejectors are recommended for use in office buildings, bank buildings, hotels, hospitals, public buildings, and in municipalities where conditions require that the pump handle drainage and sewage from low levels.

One of the most important features of Form "A" is its accessibility and the fact that it is a complete pumping plant, with receiver, complement of valves, etc. The cast iron sewage receiver is located in the center of a dry pit built of concrete or steel embedded in concrete. In the dry annular space between the receiver and the ejector pit is located a Form "A" Ejector, with suctions connected to the bottom of the receiver, and with discharge connections brought together in a double branch fitting. Special flush-back check valves are provided on the discharge of each unit. For additional safeguards, gate valves are installed on the suction and discharge of each pump.

Form "A" is equipped with automatic lubrication and high water alarm. It will handle drainage at boiling point, and assures low maintenance cost and low power consumption. Capacities 100-600 GPM each unit and larger. Heads up to 100 feet and higher.

A few typical installations follow: First National Bank, Boston; Bell Telephone Bldg., St. Louis; Elks Club, Los Angeles; Ritz-Carlton Hotel, Philadelphia; Tutweiler Hotel, Birmingham; Palace Theatre, New York; Chicago Tribune Tower; Masonic Temple, Topeka; Adolphus Hotel, Dallas. Write for Bulletin 2400.

THE YEOMANS NON-CLOGGING IMPELLER

Yeomans Non-clogging Impeller

This impeller is used in the submerged type screenless ejector described on page 8, and also in the Form "A" Ejector described on this page. It is truly non-clogging as there are but two waterways through the impeller and no hubs or vanes to obstruct the entrance. Because of unusual blade width, large water passages and rounded forward blade ends, it will pass rags and solids only slightly smaller than the discharge orifice, eliminating screens of all kinds.

"Yeomalite treatment" coats the impeller and protects it against rust and corrosion, acid, alkali, and abrasion. It increases efficiency by reducing friction losses, thus saving power.

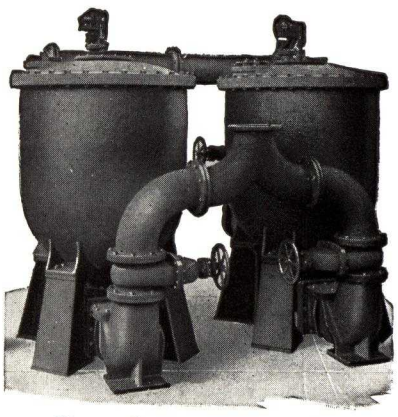
THE SHONE SYSTEM OF SEWAGE EJECTION

The Shone Sewage Ejector was invented over fifty years ago by Isaac Shone, a noted English sanitary engineer. Since then, with few changes in design, it has been accepted as the standard sewage ejector by leading engineers. It is not only the oldest but the most modern ejector on the market today. Capacities range from 50-600 GPM, heads, up to 75 feet.

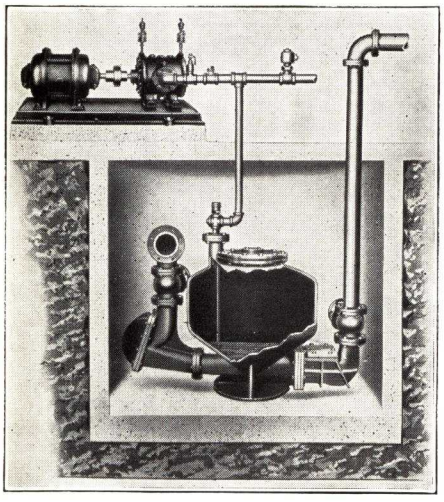
Shone Ejectors are used in large office buildings, hotels, industrial plants, municipal sewerage systems and government buildings. They are especially desirable for use where compressed air is required for other purposes within the building. The Shone Ejector consists of a closed sewage receiver or pot with complement of gate and check valves and automatic bronze air valves, motor driven air compressor and automatic control. The sewage from the drains enters the vented ejector and when the receiver is full, the automatic bronze air valves are actuated, admitting compressed air to the receiver which in turn discharges the contents to the street sewer.

A few typical installations follow: Union Station, Chicago; Federal Reserve Bank, Houston; Philadelphia Convention Hall; Chase National Bank, New York; Sears-Roebuck, Washington; Hotel Gibson, Cincinnati; Book-Cadillac Hotel, Detroit; U. S. Post Offices, Sacramento, Calif., Camden, N. J., Pittsburgh; Tyler, Texas; Dept. of Commerce, Washington; Dept. of Labor Bldg., Washington; Municipal installations include Cedar Rapids, Iowa; Dayton, Ohio; Dallas, Texas; Milwaukee, Wis.

Architects and engineers desiring information are requested to write for Bulletin 4000 and 4050.



Shone System Pneumatic Sewage Ejector



Electrically Controlled Ejector

This newest Shone has NO MOVING PARTS on or inside the ejector—the only ejector dispensing with such accessories. High efficiency, lower first cost and maintenance, are characteristic. Bulletin 4050.

WATER SUPPLY FOR BUILDINGS

For more than 38 years Yeomans has been called upon to solve difficult problems involving water supply. The experience gained in thousands of successful installations is represented in the pumps described on the following pages.

It is hoped that the brief description, together with the chart below, will be of decided help to the architect or engineer in the selection of pumps for water supply.

TYPES OF WATER SUPPLY SYSTEMS

There are three types of water supply systems in general use today. Let us analyze them one at a time.

GRAVITY SYSTEM

In the gravity system, the open storage tank is placed on or above the roof, usually in a pent house. The water supply pump, generally located in the basement, pumps the water to this tank from which water is supplied to the various fixtures in the building, by gravity.

PRESSURE SYSTEM

In the pressure system, the closed storage tank is generally located in the basement together with the pump, thus eliminating the construction of roof tanks. The water is forced into the supply lines by means of pressure built up by the pump with the aid of an air cushion in the storage tank.

TANKLESS BOOSTER SYSTEM

In this system, the tank, air compressor, complex piping and valving are eliminated. The tankless booster system consists of simple piping, a balanced impeller pump, and an automatic electric pressure regulator that cuts in the pump when city pressure is inadequate to supply all fixtures and cuts it out when city pressure is restored.

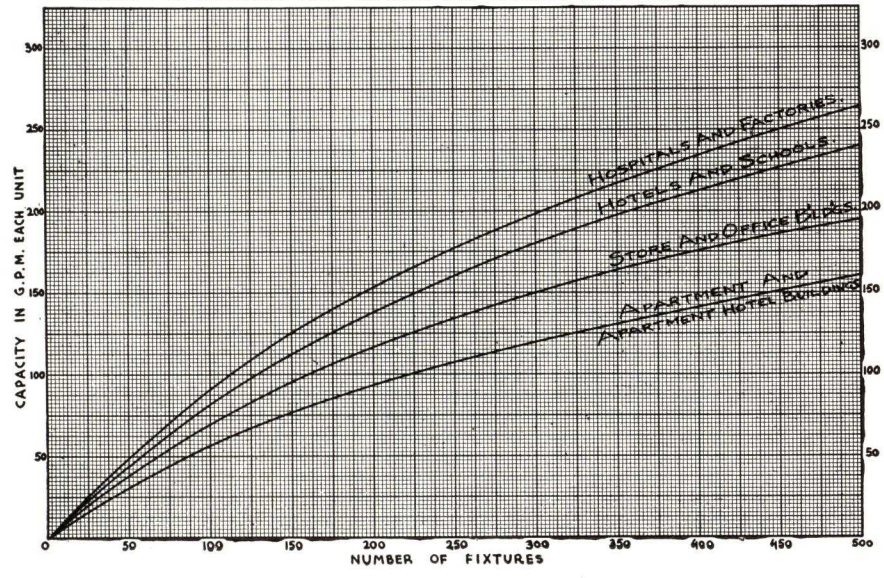
HOW TO SELECT THE PROPER PUMP

In order to select the proper pump for water supply, two things must be known, the capacity required for each pump, and secondly, the discharge head. The chart below gives pump capacities in gallons per minute for various types of buildings, depending on the total number of fixtures. The problem of calculating the discharge head is discussed below.

HOW TO CALCULATE THE DISCHARGE HEAD

In the centrifugal type of pump, the pump derives the benefit of city pressure, and when determining net head or pressure required of pump, deduct city pressure, figuring 2.3 ft. for each pound of pressure. This applies to all three systems.

CHART FOR FIGURING PUMP CAPACITY FOR VARIOUS TYPES OF BUILDINGS.



GRAVITY SYSTEM

Figure vertical distance from pump to top of roof tank. Assuming proper sized risers and branches are used, friction will be slight. Deduct from total elevation, city pressure figured at 2.3 feet per pound pressure. The result is the net head required of the pump.

PRESSURE SYSTEM

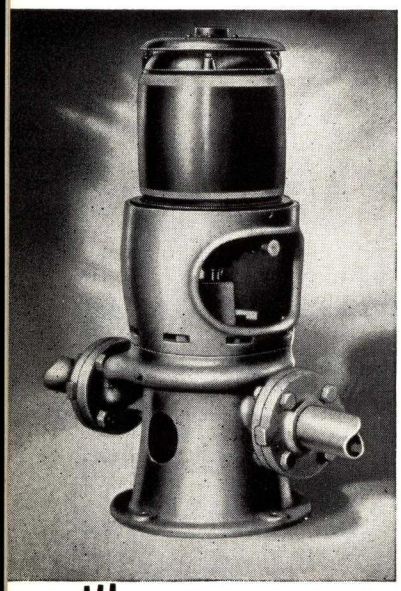
Figure vertical distance from pump to highest fixture. Add pressure regulation of 10-20 pounds above minimum pressure. Add pressure required at highest fixture. Deduct minimum city pressure.

TANKLESS BOOSTER

In the tankless type system, the pump serves merely as a booster to the city pressure. The pressure regulator is set to cut in the pump when city pressure drops slightly below that required to supply ample pressure at top floor fixtures, and to cut out the pump when city pressure is restored. Figure net pressure on the pump as previously described.

YEOMANS PUMPS FOR WATER SUPPLY

THE "TURRET" PUMP . . . FITS RIGHT IN THE PIPE LINE



WHERE THE "TURRET" PUMP IS USED

In the "Turret" Pump, Yeomans has developed an aggressive and worthy competitor to the familiar horizontal split case centrifugal pump. For here is a pump that fits right in the pipe line. In the smaller sizes, no support is needed; in the larger models, no built up foundation is necessary. The motor is on top, away from floor dirt and moisture. Also, the "Turret" Pump takes but little space. Capacities range from 10-600 GPM, and heads from 10 to 300 feet.

Lighter, more compact, more efficient, the "Turret" Pump is ideal for water supply. It can be used in the gravity, pressure, or tankless booster systems with considerable savings in installation costs and operation.

For complete information on the "Turret" Pump ask for Bulletin 1200.

HERE'S HOW IT OPERATES

As can be seen, the "Turret" fits right in the pipe line. The liquid is pumped by a semi-steel, accurately balanced impeller operated by a vertical motor. In the gravity system, a float switch located near the storage tank automatically controls the supply of water. In the pressure system and tankless booster system, a pressure regulator automatically controls the water pressure supplied.

The "Turret" Pump guarantees uninterrupted performance. Architects and engineers who specify it will never have any regrets.

WITH A GRAVITY SYSTEM

The diagrammatic sketch below indicates the "Turret" Pump in use in the gravity type of cold water supply system. The pump, located in the basement together with the automatic control panel, pumps city water to the storage tank which is located on the roof. From this tank the water is then supplied to the various fixtures in the building by gravity.

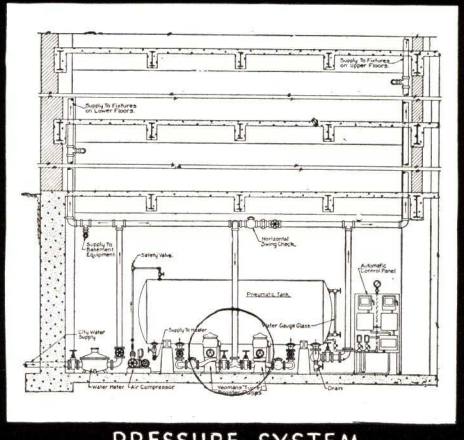
WITH A PRESSURE SYSTEM

In a pressure system, the "Turret" Pump and the automatic control panel, together with the pneumatic storage tank are located in the basement. City water supply is pumped into the tank by the "Turret" Booster. Compressed air is also supplied to the tank by a compressor which furnishes the required volume of air to maintain the air cushion in the tank. The pressure built up by the "Turret" Pump is sufficient to force the water to the various plumbing fixtures.

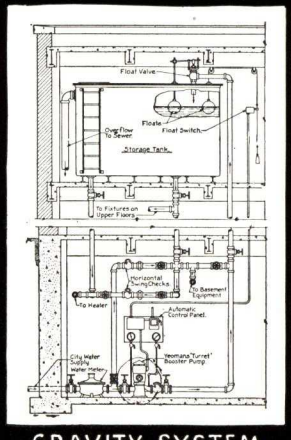
WITH A TANKLESS BOOSTER SYSTEM

For the Tankless Booster system, the "Turret" Pump makes an ideal booster. It greatly simplifies pipe connections and valving, and reduces the cost of installation. In this system no tanks are used. The "Turret" is inserted in the city water supply line supplying water to the various fixtures. It operates only when city pressure is inadequate to supply proper water pressure at upper floor fixtures.

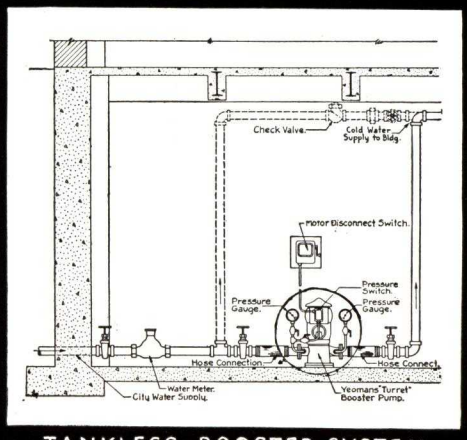
• "TURRET" PUMP ARRANGEMENTS FOR WATER SUPPLY SYSTEMS •



PRESSURE SYSTEM

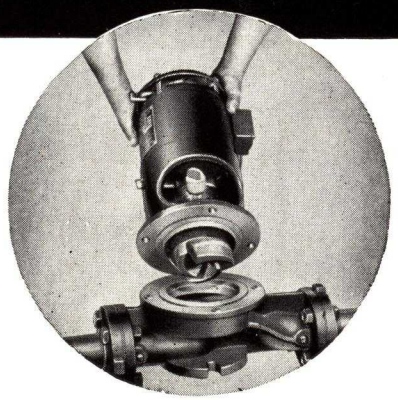


GRAVITY SYSTEM



TANKLESS-BOOSTER SYSTEM

YEOMANS PUMPS FOR WATER SUPPLY



OUTSTANDING ADVANTAGES OF THE "TURRET" PUMP

WHERE space is limited, where frequent inspection is necessary, as in the food industry, and where a better appearing pump is desired, the "Turret" Pump is the natural selection for the architect.

Here are listed a few of its many advantages over other types of pumps.

● **Widest Application:** The "Turret" Pump can be used for practically any pumping problem. It can be used for handling hot or cold liquids, foods, acids, alkalis. It fits right into the pipe line. Therefore a minimum of floor space is required, and total costs are reduced through simplified piping connections.

● **Light and Compact.** As can be seen from the illustration, the "Turret" is light in weight, is easily handled, and easily assembled.

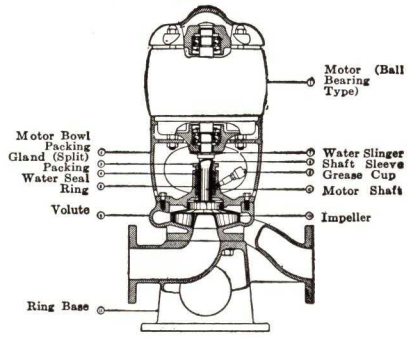
● **Positive Alignment.** There are no couplings in the "Turret".

● **No Pump Bearings.** The "Turret" has no bearings in the pump casing, thus preventing grease or oil from entering the liquid being pumped.

● **Accessibility without disturbing piping.** The "Turret" Pump can be quickly inspected without breaking any connections, and it can be just as easily re-assembled.

● **Removable Bronze Shaft Sleeve:** In the "Turret" Pump the shaft sleeve is pressed on the motor shaft and locked in place. This eliminates wear of the shaft. The sleeve can also be replaced without disassembling the motor.

● **No foundation needed:** No supports are needed for the smaller size "Turret" Pump. The larger sizes are supplied with a cast iron base. No built-up foundations are necessary.



SPECIFICATIONS FOR WATER SUPPLY SYSTEMS

GRAVITY SYSTEM

PUMP: Furnish and install where indicated on plans a single (or duplex) automatically controlled electric driven "Turret" Pump as manufactured by Yeomans Brothers Co., having a capacity of_____GPM while delivering water into roof tank against a static head of_____ feet with the aid of_____pounds city pressure at pump suction.

MOTOR: Pump shall be driven by vertical _____HP_____RPM ball-bearing motor suitable for current available at building.

CONTROL APPARATUS: The control shall consist of a Yeomans single pole enclosed float switch with accessories for mounting in penthouse and a single control panel with enclosed automatic starter (with overload protection for polyphase motor) and a 3-pole enclosed externally operated fused safety switch mounted at pump location.

PRESSURE SYSTEM

Furnish and install where indicated on plans a Yeomans single (or duplex) automatic electric pressure type water supply system, including electric motor-driven centrifugal pump, compression tank, automatic control apparatus, and independent motor-driven air compressor with manual control.

PUMP: Shall be close-coupled vertical "Turret" Pump as manufactured by Yeomans Brothers Co., with inlet and outlet connections on same centerline, and having a capacity of_____ GPM while maintaining a pressure of_____ pounds with the aid of_____pounds city pressure.

MOTOR: Pump shall be driven by vertical _____HP_____RPM ball-bearing motor suitable for current available at building.

CONTROL APPARATUS: Furnish Yeomans single control panel having enclosed automatic starter, diaphragm type pressure regulator, fused safety switch, pressure gauge and manual starting switch for air compressor.

MOTOR DRIVEN AIR COMPRESSOR: Furnish a single cylinder air cooled air compressor having a capacity of_____cu. ft. of free air per minute against maximum pressure of_____pounds. Compressor to be mounted on separate base plate and driven through V belt drive by_____ HP motor. Provide ½" relief valve for air line.

PRESSURE TANK: Furnish and install_____ inch diameter by_____ft. long steel pressure tank suitable for a working pressure of_____ pounds, and to conform to local requirements. Tank to be provided with necessary inlet and outlet and drain connections, ½" tapping for air compressor line and tapping for water glass cocks and pressure gauge.

TANKLESS BOOSTER SYSTEM

Furnish and install where shown on plans one Yeomans Tankless Booster system complete with motor driven pump, automatic control and accessories.

PUMP: Shall be "Turret" Pump as manufactured by Yeomans Brothers Co., with inlet and outlet connections on same centerline, and having a capacity of_____GPM while maintaining a minimum water pressure of 10 pounds at top-floor fixtures with the aid of_____ pounds city pressure at pump suction.

MOTOR: Pump shall be driven by vertical _____HP_____RPM ball-bearing electric motor suitable for current available at building.

AUTOMATIC CONTROL: Pump shall be provided with diaphragm type pressure regulator, adjusted to start pump automatically during periods when city pressure drops below_____ pounds, and to stop pump when city pressure is restored to_____pounds. When operating, pump shall boost water pressure at least _____ pounds above city pressure supplied to pump. Provide pressure gauges and rubber hose connections to both suction and discharge connections of pump.

BYPASS: Install bypass between city service and main supply to fixtures.

"TURRET" PUMP SELECTION TABLE

Capacity In G.P.M.	TOTAL HEAD IN FEET																											
	20				30				50				70				100				125				150			
	Pump No.	Size In.	H.P. Motor	R.P.M.	Pump No.	Size In.	H.P. Motor	R.P.M.	Pump No.	Size In.	H.P. Motor	R.P.M.	Pump No.	Size In.	H.P. Motor	R.P.M	Pump No.	Size In.	H.P. Motor	R.P.M.	Pump No.	Size In.	H.P. Motor	R.P.M.	Pump No.	Size In	H.P. Motor	R.P.M
15	75	¾	¼	1750	73 75	¾ ¾	¼ ⅓	3500 1750	73	¾	⅓	3500	75	¾	1	3500	75	¾	1 ½	3500	75	¾	2	3500	75	¾	3	3500
25	73 100	¾ 1	⅓ ⅓	3500 1750	73 100	¾ 1	½ ½	3500 1750	73	¾	¾	3500	75	¾	1 ½	3500	75	¾	2	3500	75	¾	3	3500	75	¾	3	3500
50	150	1 ½	½	1750	100 150	1 1 ½	1 ¾	3500 1750	100 101	1 1½	1 ½ 2	3500 1750	150 101	1 ½ 1½	2 2	3500 1750	150	1 ½	3	3500	150	1 ½	5	3500	150	1 ½	5	3500
75	150 150	1 ½ 1 ½	1 ¾	3500 1750	150 150	1 ½ 1 ½	1 1	3500 1750	150 101	1 ½ 1 ½	1 ½ 2	3500 1750	150	1 ½	3	3500	150	1 ½	3	3500	150	1 ½	5	3500	150	1 ½	5	3500
100	150 150	1 ½ 1 ½	1 1	3500 1750	150 200	1 ½ 2	1 ½ 1	3500 1750	150 101	1 ½ 1 ½	2 3	3500 1750	150 301	1 ½ 3	3 5	3500 1750	150 301	1 ½ 3	5 7½	3500 1750	150	1 ½	5	3500	150	1 ½	7 ½	3500
125	200 300	2 3	2 1	3500 1750	200 300	2 3	2 1 ½	3500 1750	200 301	2 3	3 3	3500 1750	200 301	2 3	5 5	3500 1750	200 301	2 3	5 7½	3500 1750	200	2	7 ½	3500	200	2	10	3500
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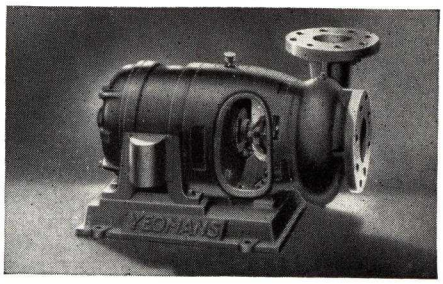
200	400	4	1 ½	1750	300 400	3 4	3 2	3500 1750	200 301	2 3	5 5	3500 1750	300 301	3 3	5 7½	3500 1750	300 401	3 4	7 ½ 10	3500 1750	200	2	10	3500	300	3	15	3500
250	400	4	2	1750	300 400	3 4	5 3	3500 1750	300 301	3 3	5 5	3500 1750	300 301	3 3	7 ½ 7 ½	3500 1750	300 401	3 4	10 15	3500 1750	300	3	15	3500	300	3	15	3500
300	400 400	4 4	3 2	3500 1750	300 400	3 4	5 3	3500 1750	300 401	3 4	7 ½ 7 ½	3500 1750	300 401	3 4	7 ½ 10	3500 1750	300 501	3 5	10 15	3500 1750	300	3	15	3500	300	3	20	3500

YEOMANS PUMPS

FOR CIRCULATION AND WATER SUPPLY

WHERE CIRCULATING PUMPS ARE USED . . .

The circulating pumps described below have various uses. They can be used for pumping brine, acid, alkali. They are exceptionally efficient in circulating drinking water and hot water. They find service in swimming pools, greenhouses, and air conditioning plants—in short, wherever liquids or semi-liquids are to be pumped.

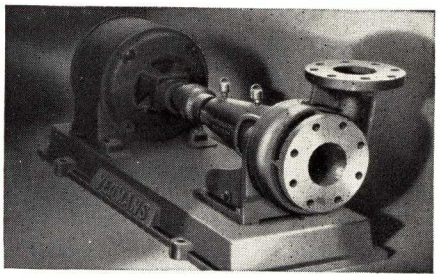


THE "MOTOPUMP" CLOSE-COUPLED CENTRIFUGAL

This substantial unit is designed for general service including the handling of hot and cold water, brine, and other liquid circulation. Designed without couplings or intermediate bearings, this pump is compact and flexible. It requires no built up foundation; it may be bolted to floor, wall, or ceiling. There are no bearings inside the pump casing. The impeller is balanced, keyed and locked to the shaft, and factory fitted, requiring no field adjustment. Capacities range from 10-600 GPM. heads from 10-300 feet.

YEOMANS CENTRIFUGAL PUMPS BALL BEARING

This pump is used for pumping high temperature liquids, foodstuffs, certain acids, liquids containing abrasives, etc. The two large ball bearings are outside and independent of the pump casing. This pump is free from vibration and critical speeds. Frictionless all-metal piston ring seal protects the bearings. Construction is extra heavy, and includes a semi-steel, semi-enclosed impeller with efficiencies equaling and exceeding those of highly finished enclosed types. Capacities range from 10-600 GPM, heads from 10-300 feet.



PUMP CAPACITIES FOR VARIOUS SIZES OF PIPE LINES

Pipe Size Inches	Hot Water Heating—G.P.M.	Domestic Hot Water Supply G.P.M.	Drinking Water* G.P.M.	Cooling Water G.P.M.
1	5-10	½-1	10-15	5-10
1¼	10-20	1-2	15-30	10-20
1½	20-30	2-3	30-45	20-30
2	30-60	3-4	45-85	30-60
2½	60-85	4-6	85-150	60-85
3	85-150	6-10	150-250	85-150
4	150-325	10-17		150-325

*Capacity should be consistent with number of fixtures supplied. Where individual cooling units are used, refer to the company for capacity.

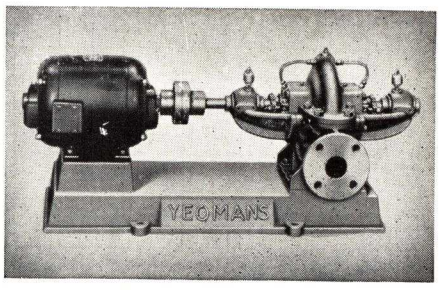
In each case the capacity of the pump should be consistent with the capacity of the heating or refrigerating element, and in no case exceeds its capacity.

For hot water heating and cooling water circulating systems the pump capacity should equal the maximum requirements of the system. For domestic hot water and drinking water circulating systems, the pump capacity should be proportional to the distance of the fixtures from the heater or refrigerator element.

In figuring the head on a pump for a closed or balanced circulating system, the total friction of the system may be taken as the total head on the pump, except in the case of drinking water circulating, in which case the total head on the pump is approximately 50% greater than the estimated friction of the system.

Circulating systems in which the return lines empty into an open tank, and the pump does not have the advantage of the return suction pressure, the head on the pump is increased by an amount equal to the static head against which it must operate, and this amount must be added to the friction head to obtain the total head on the pump.

The character of the insulation of the pipe line is also a factor to be considered. For the average installation, the above table gives the desirable pump capacity for various size of pipe lines.



YEOMANS HORIZONTALLY SPLIT CASE PUMPS
FOR WATER SUPPLY AND CIRCULATION IN BUILDINGS

This pump is used for house supply and general service—usually in large installations. It is designed for easy maintenance, and may be inspected without disturbing piping. The impeller is balanced, enclosed. Bearings are ball or roller type, insuring smooth operation and long life. Equipped with extra deep stuffing boxes with bolted glands. Also available in multi-stage type. A highly efficient and satisfactory pump for capacities of 25-1000 GPM, and heads up to 400 feet. Described in Yeoman's fully illustrated Bulletin HS-1300.

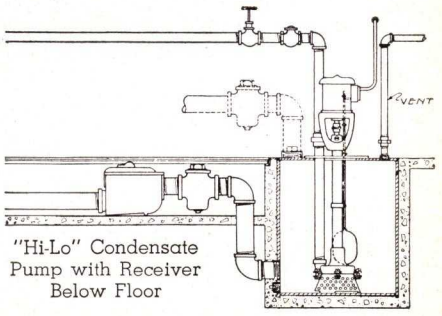
YEOMANS PUMPS FOR HEATING SYSTEMS

THE USE OF PUMPS IN HEATING SYSTEMS

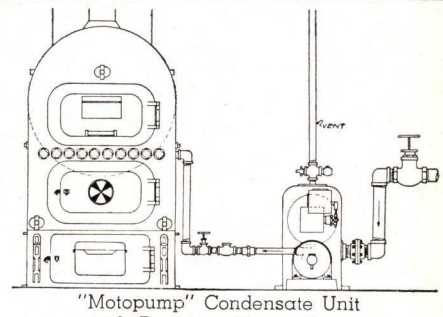
In many heating installations it is necessary to place radiation or heating units below the boiler water line. In such cases it is only necessary to provide a pump of sufficient capacity to handle the condensate from these units, allowing condensate from radiation on upper floors to return to the boiler by gravity.

These pumps, when properly selected, often make poorly constructed heating systems work better, and also afford great saving of fuel. With gas or oil fired boilers they are often the means of overcoming most of the operating difficulties.

The Yeomans Condensation Pumps and Receivers described below are designed for automatically returning condensate to boilers from gravity steam heating systems.



"Hi-Lo" Condensate Pump with Receiver Below Floor



"Motopump" Condensate Unit with Receiver Above Floor

"HI-LO" CONDENSATION RETURN PUMP

This unit is designed for automatically receiving and returning condensate to boilers from high or low returns in gravity type systems. Three sizes are available having capacities ranging from 1 to 10000, 15000, 20000 and 30000 sq. ft. of direct radiation against pressures of 10, 15, 20, and 30 pounds.

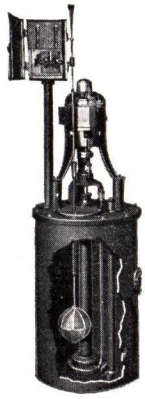
No other condensate return pump combines Yeomans advanced features. "Hi-Lo" is entirely rustproofed. It is quickly installed—comes ready to plug in. Among its many features are high efficiency, liberally rated ball bearing motor, low operating cost, built-in automatic control, enclosed bronze impeller, heavy duty sealed bearings, and a copper-bearing steel receiver 24 inches in diameter by 28 inches deep furnished with cast iron steam tight cover.

TABLE OF SIZES

Unit No.	Rating Sq. Ft. Dir. Radiation	Discharge Pressure Lbs.	Max. Pump Cap. G P M	Motor H.P.	Speed R.P.M.
HL-10	5000	10	7½	½	1750
	10000	10	15	½	1750
	15000	10	22½	½	1750
	30000	10	45	½	1750
HL-20	5000	20	7½	½	3500
	10000	20	15	½	3500
	15000	15	22½	½	3500
HL-30	5000	30	7½	¾	3500
	10000	30	15	¾	3500
	15000	20	22½	¾	3500

"MOTOPUMP" CONDENSATION RETURN UNITS

"MotoPump" is designed for gravity steam heating systems where the return lines are sufficiently high above the boiler room floor to permit mounting the pump on concrete foundations or on the boiler room floor. It is not recommended for installation in pits. Small size, compactness, and unusually high efficiency are the most prominent characteristics of "MotoPump". A small motor and low operating cost are the natural results of such high pump efficiency. Construction features include elimination of couplings. A special enclosed bronze impeller is largely responsible for the performance records of "MotoPump". But every other detail has also been worked out with typical Yeoman thoroughness to contribute its part to the effectiveness of the complete unit.



Capacities range from 1000 to 100000 sq. ft. of direct radiation, and for pressures up to 100 pounds. Units for higher pressures can also be supplied. Ask for Bulletin 5000.

VERTICAL CONDENSATION UNITS

For those installations where return lines are located below the floor, or are otherwise too low for horizontal pumps, the Yeomans Type V (with cast iron receiver and cover) and Type VS (with steel receiver and cover) vertical condensation return units are used. These pumps are available in sizes ranging from 1000-100000 sq. ft. of radiation against pressures of 10-100 pounds. For more complete data write for Bulletin C5400.

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Throughout the civilized world, pumps bearing this familiar trade mark are working night and day. Let the trustworthy Yeomans name be your guide in the specifying of precision pumps for any use.

DAHLQUIST MANUFACTURING CO., INC.

Range Boilers, Tanks, Storage Heaters and Automatic Storage Systems Both Gas and Electric, in Copper and Copper Silicon Alloy

MAIN OFFICE AND PLANT

38 West Third Street, SOUTH BOSTON, MASS.

BRANCH OFFICE: 41-14 24th St., LONG ISLAND CITY, N. Y.

DAHLQUIST HEAVY PRESSURE COPPER BOILER

For Office Buildings, Hospitals, Institutions, Commercial and Industrial Uses

Boilers Built to Special Design and Specifications

One of the specialties of this Company is the manufacture of large copper pressure boilers for special requirements in commercial institutions, hospitals and industrial fields. Our special facilities and equipment for manufacturing and years of highly specialized experience have been recognized by architects and engineers. This is clearly demonstrated by the size and number of the tanks listed on this page, which is only a partial list of the large tanks which have been installed in the past.

Capacities Up to 10,000 Gallons

The capacity of tanks to use depends somewhat on the type of service desired. Often it is more economical to use several smaller tanks of say 1000 gallons than one large one of 3000 or 4000 gallons capacity. If large quantities of water are constantly required, we can make copper boilers up to 10,000 gallons capacity.

Tests and Working Pressures

These large boilers can be made up to 400 lbs. working pressure. Boilers are thoroughly tested for the required pressures before they leave the factory.

Supplied With or Without Heating Coils

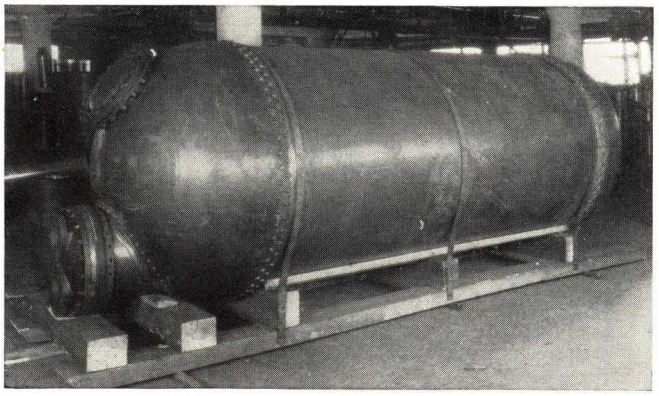
Heating coils may be installed as designed by the architect and engineer or to take coils supplied by others, as desired.

Material Specifications

Boilers are made to special design and specifications of architects and engineers. Any weight metal required is used.

Longitudinal seams on boilers up to 72-in. diameter are either brazed by special process, hard hammered and heavily backed with solder, or triple riveted and heavily backed with solder. Girth seams are always riveted and heavily backed with solder. All heads are hand drawn and hard hammered. Connections are made of bronze.

Heating Elements—Copper tubing is used for the heating elements as required and expanded to bronze tube sheet.



A Typical Dahlquist Hot Water Boiler Ready for Shipment

Partial List of Installations of Large Size Copper Tanks of Our Manufacture

Building and Location	Number and Size Tanks (Gal.)
Chamber of Commerce Building, Boston, Mass	2—1000 1— 500
John Hancock Life Ins. Building, Boston, Mass.	1— 800
E-Z Mills, Inc., Bennington, Vt.	1—1500
Northwestern Hospital, Minneapolis, Minn.	1—2000
Minneapolis Knitting Works, Minneapolis, Minn.	2—2000
St. Barnabas Hospital, Minneapolis, Minn.	1—2000
Allegheny General Hospital, Pittsburgh, Pa.	10—2000
Hotel Penn-Alto, Altoona, Pa.	1—1400
New York Life Ins. Building, New York, N. Y.	5—1000
Great Northern Paper Co., Millinocket, Me.	1— 500
Harrisburg Polyclinic Hospital, Harrisburg, Pa.	1— 700
U. S. Supreme Court Building, Washington, D. C.	2— 350
Dept. of Justice Building, Washington, D. C.	3—1500
U. S. Post Office Building, Pittsburgh, Pa.	2—1000

DAHLQUIST DIRECT OR STREET PRESSURE COPPER BOILERS

Massachusetts Tests Boilers and Identification

The State of Massachusetts requires that all range boilers be made for use at a working pressure not exceeding 42½% of the test pressure. The tests required are unusually severe and higher than in most parts of the country. The law also requires that the name of the manufacturer, the test, working pressure and year of manufacture be stamped on the boiler. This assures absolute identification and quality of each boiler produced.

Products of the Dahlquist Mfg. Co., Inc.

Range boilers from 25 to 120 gallons capacity, made from copper and copper-silicon alloys.

Storage tanks from 150 to 10,000 gallons capacity, made of copper and copper-silicon alloys.

Automatic gas hot water storage systems, both underfired and side arm, in sizes from 5 to 250 gallons capacity.

Automatic electric hot water systems, single and double element, in sizes from 5 to 250 gallons capacity.

Tankless heaters.

Multi-unit automatic storage systems, designed to furnish hot water where gas is used as a heating medium.

Any special equipment made to customer's specifications in copper and copper-silicon alloys.

Tests and Working Pressure

Massachusetts 200-lb. test, stamped 200 lbs.—85 lbs. w.p. Outside of Massachusetts can be used for 100 lbs. w.p.

Massachusetts 250-lb. test, stamped 250 lbs.—106 lbs. w.p. Outside of Massachusetts can be used for 125 lbs. w.p.

Massachusetts 300-lb. test, stamped 300 lbs.—127 lbs. w.p. Outside of Massachusetts can be used for 150 lbs. w.p.

Massachusetts 400-lb. test, stamped 400 lbs.—170 lbs. w.p. Outside of Massachusetts can be used for 200 lbs. w.p.

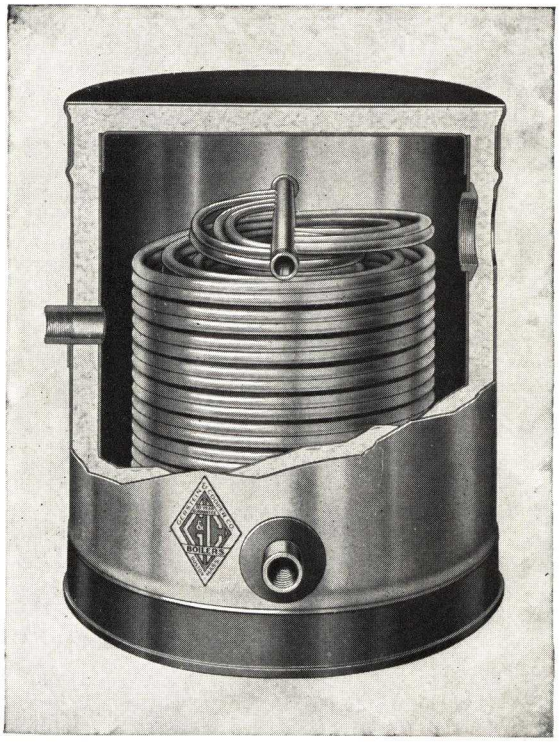
GERSTEIN & COOPER COMPANY

Manufacturers of Range Boilers, Tanks and Storage Heaters in All Copper and Copper Silicon Alloy

FACTORY AND MAIN OFFICES

SOUTH BOSTON, MASS.

NEW YORK, N. Y., 440 West 22nd Street BALTIMORE, MD., 522 Park Avenue

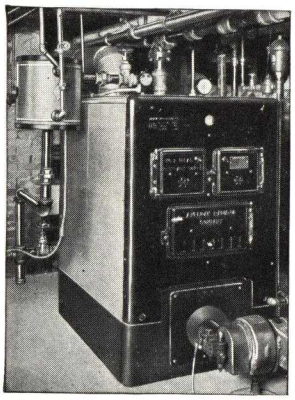


G & C Copper Range Boilers

25, 30, 40, 50 and 60-gal. range boilers will be regularly furnished with Lowtap or Hilowtap tappings.

80 to 100 gals. regularly furnished with 1¼-in. tappings.

Extra tappings or tappings larger than those regularly furnished may be supplied.



A Typical Hot Water Installation of Tankless Heater

G & C Copper-Silicon-Alloy Range Boilers

Electric welded construction throughout: Regularly furnished in 25, 30, 40, 50 and 60 gals. with Lowtap or Hilowtap tappings, 80 to 100 gals. regularly furnished with 1¼-in. tappings.

Extra tappings or tappings larger than those regularly furnished may be supplied.

G & C Tankless Water Heater

The Gerstein & Cooper Water Heater is a ruggedly built, practical heater, capable of delivering 360 gals. of hot water per hour at low operating cost. The shell is heavy gauge copper, electrically welded and thoroughly insulated. The copper tubing is silver-brazed to the headers with no threaded or ground joints. It is ideally adapted for installation on automatically fired coal, oil or gas burning boilers in institutions, dwellings, industrial plants, etc. It is supplied in red, green or blue lacquer.

G & C Storage Tanks

G & C Storage Tanks are made of all-copper or copper silicon alloy of the proper gauge metal for specified operating pressures.

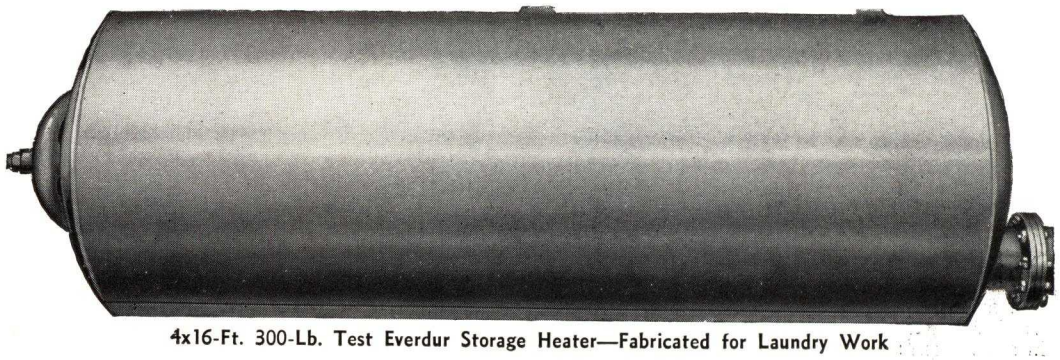
Copper tanks are of riveted and brazed construction and are tin lined.

Copper silicon alloy tanks are of electric weld construction throughout.

Both types are rigidly inspected and tested in accordance with Massachusetts Regulations. They are provided with handholes or manholes, or both.

Recent Gerstein & Cooper Installations

House of Representatives Office Building
U. S. Senate Office Building
Potomac Power Company Plant, Washington, D. C.
Botanical Gardens, Washington, D. C.
Internal Revenue Building, Washington, D. C.
National Health Institute, Washington, D. C.
U. C. Capitol Terrace Garage, Washington, D. C.
Naval Ammunition Depot, Thorne, Nev.
U. S. Post Office, Cordova, Alaska
U. S. Post Office, Breckenridge, Tex.
Marine Hospital, Baltimore, Md.
U. S. Post Office, Malone, N. Y.
U. S. Post Office, Arlington, Mass.
U. S. Post Office, Des Moines, Iowa
U. S. Post Office, Mobile, Ala.
San Diego, Cal. (Naval Station)
U. S. Coast Guard, Biloxi, Miss.
U. S. Naval Barracks, Charleston, S. C.
U. S. Quarantine Station, Tampa, Fla.
U. S. Post Office, Warren, Ohio

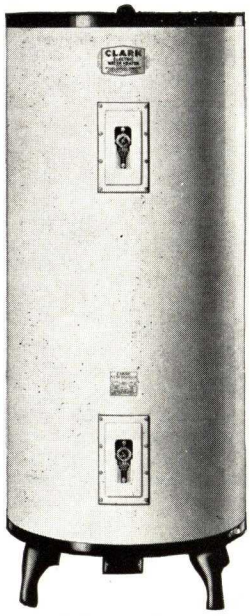


4x16-Ft. 300-Lb. Test Everdur Storage Heater—Fabricated for Laundry Work

McGRAW ELECTRIC COMPANY

CLARK WATER HEATER DIVISION

5201 West 65th Street, CHICAGO, ILLINOIS



50-Gallon Clark
Round Type Heater

Advantages of Electricity in Water Heating

Electricity offers many obvious advantages over conventional methods of water heating. It is clean, safe, odorless, and dependable. Since there is no fire or smoke, electric heaters may be used in locations where flues and ventilators would make other types impractical or uneconomical. The Clark Electric Water Heater is entirely automatic, requiring no attention or maintenance, and because of the exclusive "Black Heat" element will give years of unfailing service under severest operating conditions.

Clark "Black Heat" Element

The exclusive design of the Clark element employing the principle of low temperature, wide area heating or "Black Heat"—so called because it does not glow even faintly red—is responsible for its remarkably long and trouble-free service. The low temperatures used spread over a wide area, heat the water quickly, yet, are not high enough to cause lime and scale precipitation in hard water, nor oxidization with pitting and corrosion in soft water.

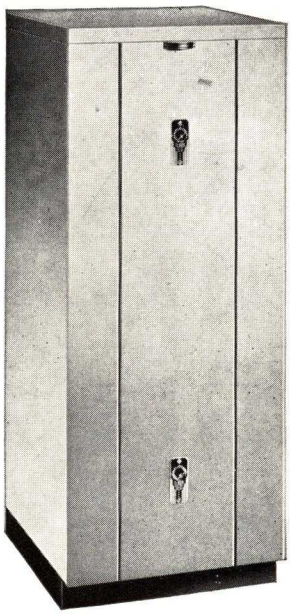
following amounts of hot water in the Clark Heater.

9 gallons at 103°
8 gallons at 115°
7 gallons at 127°
6 gallons at 140°
5 gallons at 152°
4 gallons at 165°

Most power companies offer a special low rate for water heating purposes which, coupled with the entire freedom from maintenance or repair costs, make the Clark Water Heater exceptionally economical.

Water and Electrical Connections

Water inlet is at bottom of heater. Outlet is at back of heater near top. Both are standard thread ¾-in. pipe. Electrical connections are made through convenient knock-out box located on bottom of heater at front, except on the square heater, where the outlet box is at the top and back of the heater.



50-Gallon Clark
Square Type Heater

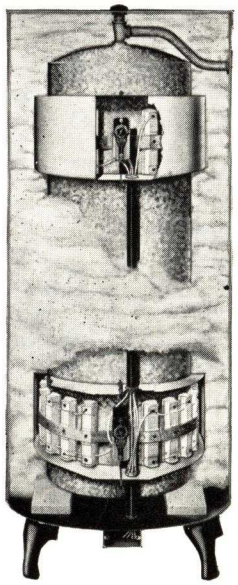
Installation

To prevent heat losses, small pipe should be used for hot water lines and heater should be installed as close to point of most frequent use as possible.

Features of the Clark

The Clark "Black Heat" element consists of a number of porcelain unit elements, each containing over 6 ft. of nichrome wire, connected together in series to form a broad belt of heat 6 in. wide and several feet long. It is clamped to the outside of the tank in a special steel channel which allows it to be removed or replaced in a few minutes' time without draining the tank or disrupting service. Clark Heaters are regularly equipped with extra heavy steel tanks (two and a half times as thick as ordinary tanks), electrically welded and heavily galvanized. They are equipped with built-in heat traps and cold water baffles. A fully automatic and remarkably reliable bellows-type thermostatic heat control is used on all Clark Heaters. A knob on the outside of the heater allows setting of thermostat to maintain any desired temperature of water between 125° F. and 165° F. A minimum of over 4 in. of mineral wool closely packed on all sides of heater prevents heat losses and enables water to be kept hot for days.

Outer shell is heavy gauge steel electrically welded. Top and base are of extra heavy spun steel. Finished in multiple coats of high gloss baked enamel. Standard color is white with black top, base and legs.



Cutaway View Showing
Double Unit Black
Heat Element

Cost of Operation

It is difficult to estimate the cost of using a Clark Water Heater without definite knowledge of the quantities required. This varies widely—some domestic installations will use only 150 kwh. per month, while others will require 400 to 500 kwh., especially where there are servants. Because of the exceptionally efficient insulation and the Clark Heat Control, which allows lower temperatures to be used, the Clark will operate at a minimum cost for the service rendered.

With the inlet temperature at 65°, 1 kwh. will produce the

A Size and Type for Every Hot Water Requirement

As shown in table below, Clark Heaters are available in a wide range of sizes. Thirty gallon and larger are offered in either single or double unit types.

Capacity, gals.	Model No. with galvanized tanks		Dimensions, in.	
	Single Unit	Double Unit	Diameter	Height
Clark Round Type Heaters				
30	30RS	30RD	22	59
50	50RS	50RD	26	60
67	67RS	67RD	28	63
82	82RS	82RD	30	65½
82	82KS	82KD	30	65½
100	100KS	100KD	32	65½
125	125KS	125KD	34	69½

			Width	Depth	Height
Clark Square Type Heaters					
5	5W	.....	16	16	37
10	10W	.....	20	20	34½
15	15W	.....	20	20	43½
30	30RSW	30RDW	21	22¼	57
40	40RSW	40RDW	23	24¼	57
50	50RSW	50RDW	25	26¼	58

Suggested Wattages: 500, 600, 750, 900, 1000, 1250, 1340, 1500, 1640, 1750, 2000, 2250, 2460, 2500, 3000.

Any of the above wattages may be specified on either unit. Wattage and voltage must be specified on each order. Heaters will be furnished for 230-volt a.c. operation, unless otherwise specified.

Sizes 82, 100 and 125-gal. will be shipped "knocked-down" for assembly in the customer's home, unless otherwise specified on order.

NATIONAL PIPE BENDING COMPANY

INCORPORATED 1883

Feed Water Heaters, Storage Heaters, Instantaneous Heaters, Fuel Oil Preheaters, Coils and Bends of Tubing, Seamless Spun Kettles of Brass

116 River Street, NEW HAVEN, CONN.

BRANCHES: NEW YORK, N. Y. and BOSTON, MASS.

AGENCIES IN PRINCIPAL CITIES

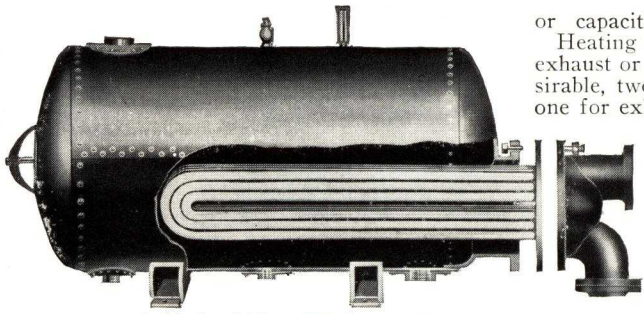
Type NT Storage Heater

National Type NT Storage Heater is a combination of a storage tank and a removable U-Bend heating element. It is designed for a given storage capacity and an hourly heating capacity through a fixed temperature range, and is furnished in either horizontal, vertical or in other combination of designs.

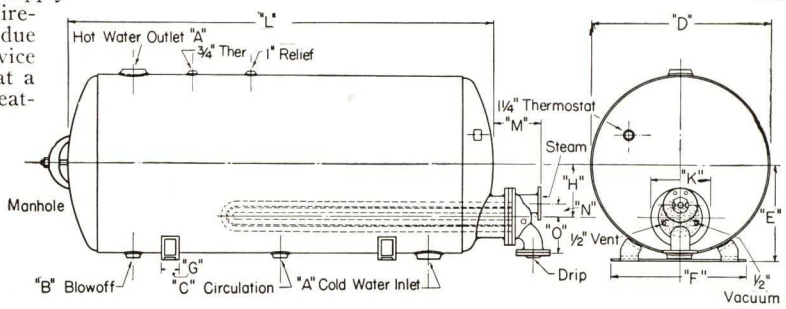
Because it is necessary to properly proportion the storage capacity with the hourly heating capacity to insure ample supply of hot water, the requirements become so varied, due to the many types of service which have to be met, that a complete list of storage heaters is not practical.

We therefore list a group of ordinarily standard tanks and heating elements, the combination of any two of which should meet most requirements. Specifications calling for sizes or capacities not listed can be supplied.

Heating elements are for use with either exhaust or live steam in the tubes. When desirable, two heating elements may be used—one for exhaust and the other as a booster—using live steam, thermostatically controlled.



National Type NT Storage Heater



Specifications

Shells — *Steel:* riveted or welded. *Steel:* copper - lined, welded. *Everdur, Herculoy,* or other alloys, welded. *Solid Copper:* riveted and brazed; Hydrostatic test to specifications.

Heating Element — Removable set of 1¼ in. o.d., No. 16 B.W.G. copper U-bends, expanded into a steel or bronze tube plate, Bronze tube supports on long tubes. Hydrostatic test, 300 lbs. per sq. in.

Steam Cover — Cast iron "Fre Flo" type with large drain pocket.

Element Port—Material to match shell, welded to shell.

NATIONAL TYPE NT STORAGE HEATERS

Type NT Storage Heater Shells											Type NH Heating Elements								
											Heating Range 40° to 180° F. Steam at 0 lbs.								
Size No.	Shell size, in.		Storage capacity, gal.	Water inlet and outlet, in.	Blowoff, in.	Circulation, in.	Shell supports, in.			Location of ports, in.	Approx. weight, lbs.	Size No.	Heating capacity, g. p. h.	Diameter tube plate, in.	Steam connections, in.		Location of steam connections, in.			Approx. weight, lbs.
NT	"D"	"L"		A	B	C	E	F	G	H		NH		K	Inlet	Drip	M	N	O	
1	18	60	65	2	1½	1½	9½	18¼	2½	9¼	400	1	100	10	1¼	¾	9¼	2	3¾	75
2	18	72	80	2	1½	1½	9½	18½	2½	9¼	450	2	150	10	1¼	¾	9¼	2	3¾	80
3	24	60	118	2	1½	1½	13¼	25	3	9¼	600	3	200	10	1½	¾	9¼	2	3¾	90
4	24	72	141	2	1½	1½	13¼	25	3	9¼	700	4	250	10	2	¾	9¼	2	3¾	175
5	30	60	185	3	1½	1½	15¾	28	3	9¼	850	5	300	10	2	1	9¼	2	3¾	185
6	30	72	220	3	1½	1½	15¾	28	3	9¼	950	6	350	12	2½	1	9¼	2½	7¾	190
7	30	84	255	3	1½	1¼	15¾	28	3	9¼	1050	7	400	12	2½	1	9¼	2½	7¾	200
8	30	96	290	3	1½	1½	15¾	28	3	9¼	1150	8	500	12	3	1	9¼	2½	7¾	210
9	36	84	365	3	1½	1½	20	33	4	14	1300	9	550	12	3	1	10	2½	7¾	215
10	36	96	420	3	1½	1½	20	33	4	14	1450	10	600	12	3	1	10	2½	7¾	220
11	36	108	475	3	1½	1½	20	33	4	14	1600	11	700	12	3	1	10	2½	7¾	300
12	36	120	525	3	1½	1½	20	33	4	14	1800	12	800	14½	3½	1¼	10	3¼	9	260
13	42	84	500	4	1½	1½	22½	36	4	14	1700	13	900	14½	3½	1¼	10	3¼	9	270
14	42	96	575	4	1½	1½	22½	36	4	14	1850	14	1000	14½	3½	1¼	10	3¼	9	285
15	42	120	720	4	1½	1½	22½	36	4	14	2150	15	1250	14½	4	1¼	10	3¼	9	370
16	42	144	860	4	2	2	22½	36	4	14	2500	16	1500	16½	4½	1½	10	4	10	425
17	42	168	1000	4	2	2	22½	36	4	14	2900	17	1750	16½	5	1½	10	4	10	450
18	48	120	950	4	2	2	25	39	4	15¾	2500	18	2000	18¾	5	2	11¼	4¼	11¼	570
19	48	144	1140	4	2	2	25	39	4	15¾	2900	19	2500	21	6	2	11¼	4¾	12¾	625
20	48	168	1310	4	2	2	25	39	4	15¾	3300	20	3000	21	6	2½	11¼	4¾	12¾	680
21	48	192	1480	4	2	2	25	39	4	15¾	3600	21	3500	23	6	2½	11¼	5¾	13¾	890
22	60	120	1420	4	2½	2½	31½	49	5	20¼	3500	22	4000	23	8	2½	10	5¾	13¾	950
23	60	144	1710	4	2½	2½	31½	49	5	20¼	3950	23	4500	25½	8	3	10	6	15¼	1050
24	60	168	2000	4	2½	2½	31½	49	5	20¼	4400	24	5000	25½	8	3	10	6	15¼	1250
25	60	192	2300	4	2½	2½	31½	49	5	20¼	4800	25	5500	25½	8	3	10	6	15¼	1310
26	72	144	2460	5	2½	2½	37	55	5	24½	6500	26	6000	25½	10	3	13	6	15¼	1380
27	72	168	2880	5	2½	2½	37	55	5	24½	7300	27	7000	29	10	3½	13	7	18	1950
28	72	192	3310	5	2½	2½	37	55	5	24½	8100	28	8000	29	10	3½	14	7	18	2000
29	84	168	3900	6	2½	2½	44½	63	6	27½	8800	29	9000	31	12	4	17	8	20	2300
30	84	216	5060	6	2½	2½	44½	63	6	27½	10600	30	10000	31	12	4	19	8	20	2460

Heating Range 40° to 180° F. Steam at 0 lbs.

ESTABLISHED 1880

THE PATTERSON-KELLEY CO., INC.

Water Heating Engineers and Manufacturers of Hot Water Heaters for More Than 50 Years

101 Park Avenue
NEW YORK, N. Y.

BRANCH OFFICES IN PRINCIPAL CITIES

Products

PATTERSON HOT WATER SERVICE HEATERS; STORAGE and INSTANTANEOUS TYPES.

Also manufacturers of Converters for hot water heating systems; Swimming Pool Heaters; Preheaters or Condensation Coolers; Reclaimers for recovering heat from waste liquids; Feed Water Heaters and Purifiers; Fuel Oil Heaters; Kelley Hot Water System for Laundries; Freon Water Coolers.

Co-operative Engineering Service

Architects place themselves under no obligation by permitting Patterson-Kelley Engineers to submit suggestions regarding heaters required for specified purposes. We offer such service without charge and, when an installation is made in accordance with our recommendation, we positively guarantee that it will furnish *all of the hot water required, as hot as required and when required.*

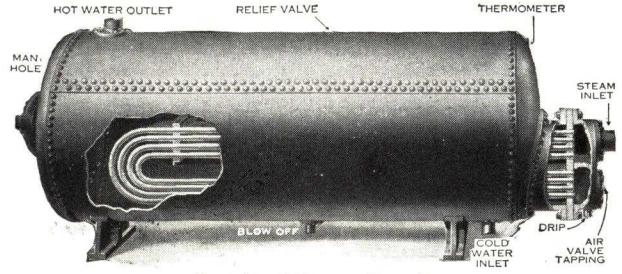
General Construction

The tubes in all Patterson Hot Water Heaters, Types B, D, E, F and L, are of heavy gauge, seamless drawn copper, tested to 1000-lb. hydrostatic pressure per sq. in. All tube heads are forged steel. The shells are either boiler plate or best quality dry sand castings of ample thickness. After assembling, each heater is tested to a hydrostatic pressure 50% greater than the specified working pressure.

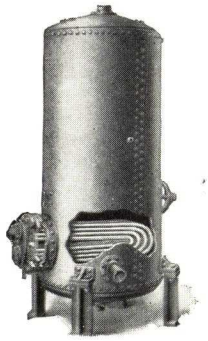
Guarantee

We guarantee the materials and workmanship of each heater to be first class in every respect, and any part proving defective within one year from date of shipment will be replaced without charge. We also guarantee each heater to heat its rated capacity of water.

Patterson Combined Hot Water Service and Storage Heaters



Horizontal Heater Type B



Vertical Heater Type L

Both the Type B, horizontal, and Type L, vertical, provide any combination of storage and heating capacities. They require only a small continuous supply of steam to heat and store sufficient water for peak load periods.

The tubes are "U" shaped seamless copper, both ends of each tube being expanded in a forged steel removable tube head and the overhanging ends supported with bronze tube supports.

Shells are of steel, steel copper lined, Everdur or solid copper. In the last three types the water comes in contact with no steel whatever, thus preventing rusty water and insuring long life to the heater.

PATTERSON COMBINED HOT WATER SERVICE AND STORAGE HEATER TYPE B

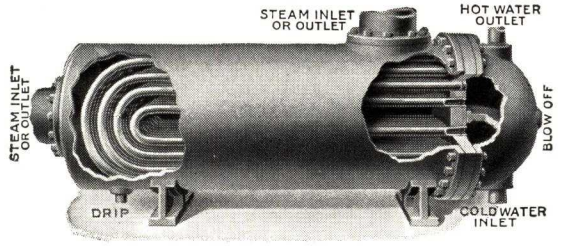
Storage capacities				Heating capacities 40° F. to 180° F.–steam at atmospheric pressure		
No.	Dimensions, in.	Capacity gal.	Approx. wt., lb.	No.	Gal., per hour	Approx. wt., lb.
1 S	24x 48	94	650	1 H	100	100
2 S	24x 60	118	750	2 H	150	115
3 S	24x 72	141	850	3 H	200	125
4 S	24x 84	164	950	4 H	250	165
5 S	30x 60	180	875	5 H	300	175
6 S	30x 72	215	975	6 H	400	200
7 S	30x 84	255	1100	7 H	500	230
8 S	30x 96	285	1200	8 H	600	265
9 S	30x120	360	1450	9 H	700	285
10 S	36x 72	310	1200	10 H	800	310
11 S	36x 84	365	1350	11 H	1000	340
12 S	36x 96	415	1450	12 H	1250	375
13 S	36x108	475	1575	13 H	1500	450
14 S	36x120	500	1700	14 H	1750	500
15 S	36x144	640	1950	15 H	2000	600
16 S	42x 72	430	1600	16 H	2500	700
17 S	42x 84	500	1800	17 H	3000	800
18 S	42x 96	575	2000	18 H	3500	900
19 S	42x108	650	2175	19 H	4000	1000
20 S	42x120	720	2300	20 H	4500	1100
21 S	42x144	860	2700	21 H	5000	1200
22 S	42x168	1000	3000	22 H	6000	1500
23 S	42x192	1155	3400	23 H	7500	2000
24 S	48x 96	750	2400	24 H	10000	2400
25 S	48x120	940	2800	25 H	12500	2800
26 S	48x144	1125	3250	26 H	15000	3200
27 S	48x168	1300	3650	27 H	20000	4400
28 S	48x192	1500	4100	28 H	25000	5500
29 S	54x120	1190	3500			
30 S	54x144	1425	4100			
31 S	54x168	1665	4600			
32 S	54x192	1900	5100			
33 S	60x120	1400	4000			
34 S	60x144	1700	4500			
35 S	60x168	2000	5200			
36 S	60x192	2240	5800			
37 S	72x174	3000	7500			
38 S	84x168	4000	10000			
39 S	96x168	5200	11200			
40 S	96x192	6000	12500			

Note—To specify Type B heaters, combine the numbers of the required storage and heating capacities. For example, "One Patterson Type B heater with No.22S. and No. 17H." has 1000 gal. storage with 3000 gal. hourly heating capacity.

Storage capacity weights are for 100-lb. W. P. shells.

Type B Heaters may also be connected below the water line of a steam boiler, and when so installed, furnish an ample supply of hot water at all times even though the boiler is not steaming.

Patterson Instantaneous Hot Water Service Heater, Type D



A water tube heater ideal for installations where requirements for hot water are nearly constant. May also be used as a booster heater installed in the discharge line from a storage heater, and is particularly adapted for heating water for swimming pools or as a converter on heating systems. With slight modifications it is used as a Condensation Cooler or as a Lo-Flo Heater in connection with a storage tank.

REVERE COPPER AND BRASS INCORPORATED

EXECUTIVE OFFICES AND GENERAL SALES DEPARTMENT
230 Park Avenue, NEW YORK, N. Y.

For Division Offices, Mills and District Sales Offices, see our Catalogue on Pipe
For Other Revere Products, see File Index

HERCULOY

(U. S. Patent Nos. 1,868,679; 1,924,581; 2,002,460; 2,009,977 and 2,035,414)
(Licensed under U. S. Patent Nos. 1,539,260; 1,933,390; 1,936,397 and others)

A COPPER-SILICON ALLOY

For Range Boilers, Storage Tanks and Unfired Pressure Vessels of All Types and Sizes

General Information

Herculoy is a patented copper-silicon-tin alloy which is ideally suited for the construction of range boilers, storage tanks and unfired pressure vessels of all types and sizes. It combines high strength and excellent physical properties with a high resistance to corrosion.

Advantages of Herculoy For Tanks

Herculoy possesses the following advantages for tank construction:

(1) Unusually high strength—its strength is comparable to that of low and medium carbon steel.

(2) Corrosion resistance similar to that of pure copper. Herculoy is immune to rust and unusually resistant to a large number of corrosive agents.

(3) Easily drawn and formed — the ease with which Herculoy may be drawn and formed, plus the fact that it is not necessary to line the basic material, makes for economy in construction and maintenance.

(4) Fabricated by any of the standard welding processes—Herculoy sheets and plates are readily welded with welding rod of the same material. The joint produced by the use of Herculoy welding rod on Herculoy sheets is of the same composition as the sheet itself and of approximately the same strength. The use of Herculoy welding rod eliminates the danger of electrolytic corrosion which is present when welds are made with welding rod differing in composition from the material welded.

(5) Herculoy meets Federal Specifications W W-P-541-9 for Copper-Silicon tanks.

Net Result

The net result is that tanks made of Herculoy are dependable, durable and last a life-time. They are particularly adapted for use under conditions of high working pressures such as are found in hot water storage tanks in large office buildings, hotels, apartment houses, etc.; also for tanks used in the process industries.

Range Boiler of Herculoy
W. A. Case & Son Manufacturing Co. of Norristown, Pa.

Leading tank manufacturers in all sections of the country use and endorse Herculoy. It is to your client's advantage for you to specify Herculoy or copper tanks wherever copper or brass piping is installed. By this combination of rust-proof materials, a completely permanent installation is assured.

Tank Design

For accepted design figures, reference can be made to the A.S.M.E. code for unified pressure vessels. Herculoy meets Federal specifications QQ-C-591 for Copper-Silicon metal and WW-P-541-9 for Copper-Silicon tanks.

PHYSICAL PROPERTIES OF HERCULOY SHEETS AND PLATES

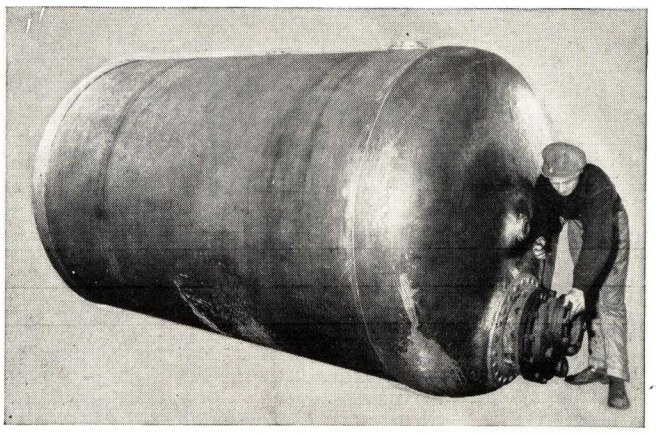
Material	Tensile Strength (lbs. per sq. in.)		Elongation (in 2 inches)	
	No. 418	No. 420	No. 418	No. 420
Hot Rolled Sheets	68,000	65,000	35%	30%
Cold Rolled Sheets	85,000	80,000	10%	5%
Cold Rolled Sheets, light annealed	75,000	70,000	15%	10%
Cold Rolled Sheets, full annealed	60,000	50,000	50%	35%

The tensile strength of Herculoy in sheet form will vary with the amount of work and heat treatment given the metal in the course of production.

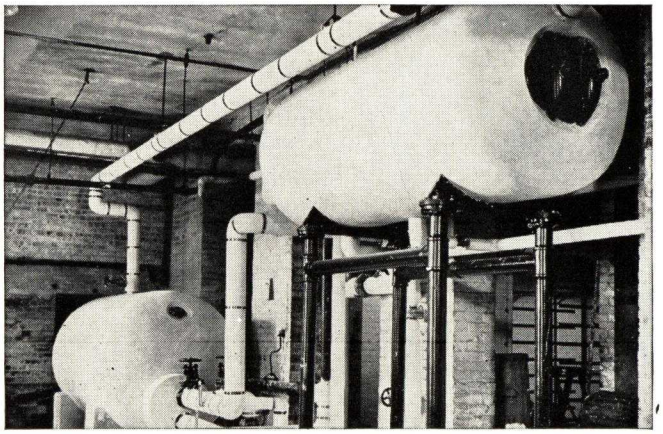
Herculoy is available in sizes and gauges for all types of tank construction.

Copper Tanks

For years Revere sheet copper has been the standard of many manufacturers of copper tanks. Revere is the oldest and largest roller of copper in America and furnishes tank stock in all commercial sizes, gauges and tempers.



Herculoy Is Ideal for High Pressure Hot Water Storage Tanks
Also for tanks used in process industries



Herculoy Storage Tanks—National Health Institute, Washington, D. C.
Fabricated by Gerstein & Cooper Co., South Boston, Mass.

RUUD gas WATER HEATERS

GO GAS
FOR HOT WATER

Why

GAS WATER HEATERS?

Because...

Gas is the only quick-heating fuel that can be used in a *fully-automatic* water heater.

Gas represents the concentration of many heat units in a small volume of fuel. Gas is clean; it leaves no residue. Gas is quick-heating. Fuel-handling and fuel storage are unnecessary. Water temperature is completely and automatically controlled. There is no water or fuel waste from overheating; there is no inconvenience from under-heating. Service is perfect. Cost has been steadily lowered during the past five years and is most reasonable.

RUUD WATER HEATERS?

Because...

For nearly fifty years, RUUD has devoted itself to one specialized field — the manufacture of gas-fired water heaters.

The group of water heaters here shown is representative but not complete. In the complete line, there are . . .

. . . automatic and non-automatic models.

. . . a complete range of prices starting from the very lowest.

. . . suitable for use with natural, mixed, manufactured and liquefied petroleum (bottled) gases.

. . . a nation-wide system of branches (see phone book) in larger cities and traveling representatives everywhere.

. . . complete factory engineering assistance in selection of type and size, specification writing and installation procedure.

RUUD MANUFACTURING COMPANY

PITTSBURGH
PENNSYLVANIA

Founded 1889
Incorporated 1897

BRANCH OFFICES IN ALL LARGE CITIES

Ruud Prices Are Low

RUUD IMPROVED AUTOMATIC STORAGE WATER HEATER

Description

RUUD IMPROVED is the top-quality, blue-ribbon leader of the RUUD group of automatic gas storage water heaters. Inside and out, it is built to exacting specifications that combine good looks and super-performance.

Automatic action is extremely simple and reliable. Heat from the quick-speed burner is absorbed by the water through the bottom and sides of the full-floating tank. When the pre-set temperature is reached, the Moment Valve snaps the gas off. When hot water withdrawals reduce the temperature of the water in the tank, the Moment Valve snaps the gas on and the heating action is repeated. Thus, hot water is always at hand in abundance and without thought or attention.

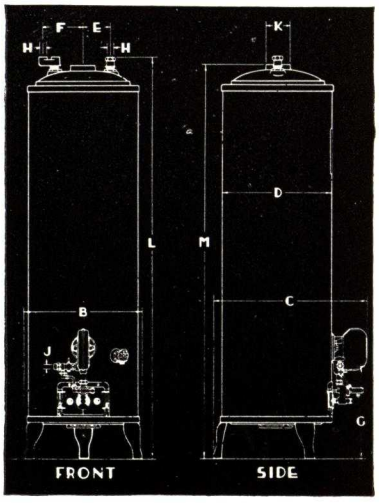
Features

Four sizes (20, 30, 45, and 75 gallon storage tanks) meet the hot water requirements of most homes and many commercial buildings. The famous RUUD All-Metal Moment Valve turns the gas on and off to maintain a supply of even-tempered hot water in the tank. The all-metal automatic gas cut-off closes all gas lines in case of pilot flame failure. New-process, full-floating and saddle-top super-tanks supplied in galvanized steel of Ruud-a-loy (strengthened copper). Clean-out hand-hole (supplied with steel tanks only) is special equipment for hard water districts. Thick insulation. Quick-heating, blue-flame bunsen burner. Adjustable gas orifice. Full-front mechanism. All parts accessible and interchangeable. High-lustre, colorful porcelite finish.

Where to Specify

For homes and institutions that want the finest automatic storage water heater made, one of blue-ribbon performance and super-life.

For hot water requirements ranging from average families using from 60 to 100 gallons of hot water a day to very large homes, apartments, office buildings, etc., whose demands can be served by the 75 gallons storage capacity and the 77 gallons an hour heating rate of the Ruud Improved No. 39-75. Where the water supply contains acid and other substances that accelerate steel tank corrosion, specify Ruud Improved with Ruud-a-loy (strengthened copper) tank. Where the water supply contains lime and other precipitating minerals, specify hand-hole models (made with steel tanks only).



ROUGHING-IN DIMENSIONS (INCHES)

Number	33-20	35-30	37-45	39-75
B	17 1/8	18 5/8	23	27 1/8
C	23 3/8	25 1/4	30	32 5/6
D	16 1/4	18	22 1/2	26 5/8
E	4	4 1/2	6	6
F	5 3/4	6 1/4	8	8
G	16	16	18	28
H	3/4	3/4	1	1
J	3/8	3/8	1/2	1/2
K	3	4	4	5
L	62 1/2	65 3/4	64 1/4	69 3/4
M	61 1/4	64 3/8	62 7/8	68 1/2

GENERAL TABLE

Number	33-20	35-30	37-45	39-75
Tank Capacity (gallons)	20	30	45	75
Heat-Speed in gallons per hour (60° rise)	28	35	56	77
Hourly B.T.U. (Nat. and Manf. Gas)	20,000	25,000	40,000	55,000
Gas line (inches)	3/8	3/8	1/2	1/2
Water line (inches)	3/4	3/4	1	1
Flue (inches)	3	4	4	5

Add 6¾" to M for 3" draft-hood
Add 8" to M for 4" draft-hood
Add 9½" to M for 5" draft-hood

Capacities

No. 33-20

Capacity: 20 gallons storage. Heat-speed, 28 gallons an hour, 60 degree rise.

For: Average families normally using between 60 and 100 gallons of hot water a day. In general, for one bathroom houses.

No. 35-30

Capacity: 30 gallons storage. Heat-speed, 35 gallons an hour, 60 degree rise.

For: Average families normally using between 100 and 200 gallons a day. In general, for one or two bathroom houses.

No. 37-45

Capacity: 45 gallons storage. Heat-speed, 56 gallons an hour, 60 degree rise.

For: Larger families normally using between 200 and 300 gallons a day. In general, for two and three bathroom houses.

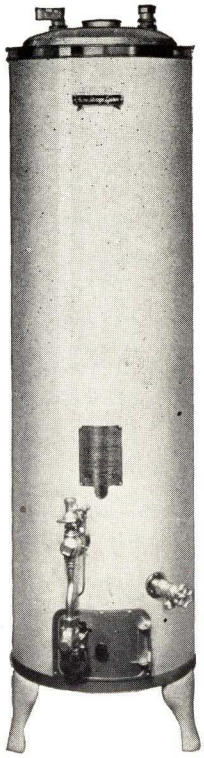
No. 39-75

Capacity: 75 gallons storage. Heat-speed, 77 gallons an hour, 60 degree rise.

For: Large homes, small apartments of not more than four families, office buildings, institutions and many other commercial requirements.

ACME AUTOMATIC STORAGE WATER HEATER

27
48



GENERAL TABLE

Number	5-15B	5-20B	5-30B
Tank Capacity (gallons)	15	20	30
Heat-Speed in gallons per hour (60° rise)	22.4	28	35
Hourly B.T.U. input (Nat. & Manf. gas)	16,000	20,000	25,000
Gas Line (inches)	3/8	3/8	3/8
Water Line (inches)	3/4	3/4	3/4
Flue (inches)	3	3	3

Capacities

No. 5-15B

Capacity: 15 gallons storage. Heat-speed, 22.4 gallons an hour, 60 degree rise.

For: Small families normally using between 30 and 60 gallons an hour.

No. 5-20B

Capacity: 20 gallons storage. Heat-speed, 28 gallons an hour, 60 degree rise.

For: Average families normally using between 60 and 100 gallons a day. In general, for one bathroom houses.

No. 5-30B

Capacity: 30 gallons storage. Heat-speed, 35 gallons an hour, 60 degree rise.

For: Average families normally using between 100 and 200 gallons a day. In general, for one and two bathroom houses.

Description

Extreme low price without sacrifice of basic quality and performance is the prime feature of the Acme Automatic Storage Water Heater.

The automatic action of the all-metal thermostat maintains a constant supply of evenly-tempered hot water in the thickly insulated tank, ready for instant withdrawal at all times. Compact, smart and colorful, Acme is a modern automatic water heater in every detail of design and operation.

Features

Three sizes (15, 20 and 30 gallon storage tanks) are designed to cover the hot water requirements of small and average homes and for other buildings with like demands. The all-metal, snap-action thermostat automatically controls gas flow, proportioning it to the owner's demands and keeping an ample supply of hot water ready in the heavily-insulated tank.

If the pilot flame goes out, the automatic gas cut-off acts to close both main and pilot gas lines. The new-process galvanized steel tank is made with an internal baffled flue. It is heavy, long-wearing and built with a corrosion-resisting saddle-top. Rock-wool insulation is full thickness. Quick-heating bunsen burner. The entire combustion chamber assembly can be removed as a unit. Mechanism is full-front; no side-rigging. Finish is colorful, high-lustre porcelite.

Where to Specify

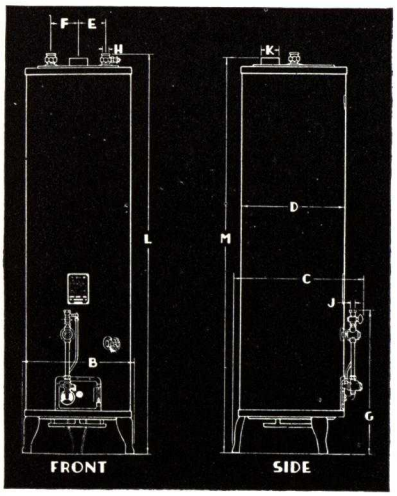
Where extreme low price is an important factor.

For hot water requirements that range from 30 to 200 gallons a day; — from very small homes with one bathroom to larger homes and families with two; — for commercial demands in the same class.

ROUGHING-IN DIMENSIONS (INCHES)

Number	5-15B	5-20B	5-30B
B	16 1/2	16 1/2	18 1/8
C	20 3/4	20 3/4	22 3/8
D	15 1/4	15 1/4	17 1/8
E	4	4	4 1/2
F	5 3/4	5 3/4	6 1/8
G	22 3/8	22 3/8	23 3/8
H	3/4	3/4	3/8
J	3/8	3/8	3/8
K	3	3	3
L	50 3/4	61 5/8	66 1/8
M	49 3/4	60 1/2	65 1/8

Note: Add 6 3/4" to M for draft-hood



RUUD C.C. (CUSTOMER CONTROL) AUTOMATIC STORAGE WATER HEATER

Description

Where fuel expense is an important factor, the RUUD C. C. (Customer Control) Automatic Storage Water Heater is recommended. The unit is fully automatic, but by simple manipulation of the three-part C. C. Burner, the owner can himself set the heat-speed (rate of gas burning and water heating), selecting it either on the basis of self-determined fuel cost limits or extent of hot water service desired.

Change in heat-speed can be made at the owner's will, increasing or decreasing it as he wishes, with hot water supply and fuel cost likewise changing in the same ratio. This is true made-to-measure and customer-controlled hot water service.

Features

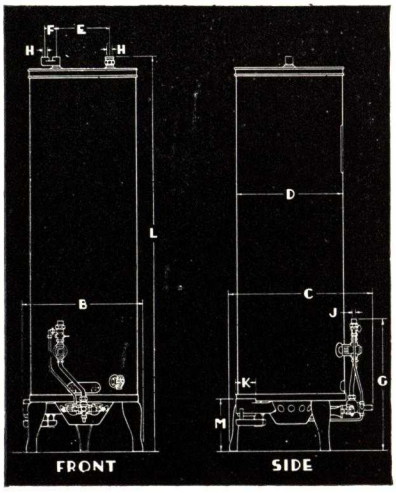
Three sizes (20, 30 and 50 gallon storage tanks) supply the three common classes of hot water demand — small homes, those of average size and those a little larger than average.

RUUD C. C. has full-automatic equipment, — all-metal thermostat and gas cut-off. Thick insulation surrounds the tank sides and is extra thick on top. The owner can control his own gas cost through simple changes of the two gas cocks. All three sizes are made with new-process, super-heavy tanks of galvanized steel; Nos. 44-30 and 46-50 are also built with tanks of Ruud-a-loy (strengthened copper). The unit is compact; finish is colorful porcelite with aluminum trimming.

Where to Specify

Where fuel expense is an important factor; where the owner desires to regulate and control his own gas cost.

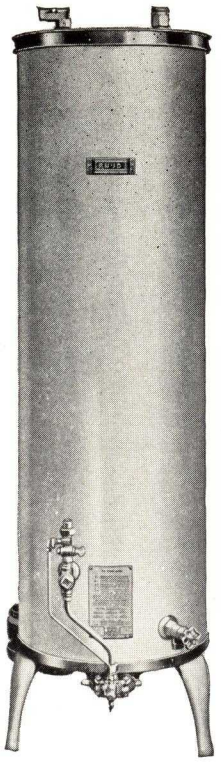
For small, average and average-plus homes where the owner wishes to select his own class of hot water service and thereby control his own fuel expense. Very popular for use with bottled gas. Ruud-a-loy (strengthened copper) tanks should be specified where the water supply attacks steel tanks or where the owner wants the longer life that Ruud-a-loy will give him.



ROUGHING-IN DIMENSIONS (INCHES)

Number	42-20	44-30	46-50
B	21	21	23
C	23½	23½	28¼
D	17¼	17¼	21¼
E	4½	4½	6
F	1¾	1¾	2
G	21	21	22⅛
H	¾	¾	1
J	⅜	⅜	⅜
K	3	3	3
L	49¼	65½	66⅛
M	8¾	8¾	8¾

Add 6¼" to M for draft-hood



GENERAL TABLE

Number		42-20	44-30	46-50
Tank Capacity (gallons)		20	30	50
Heat-Speed in gallons per hour (60° rise)	Adj. No. 1 Adj. No. 2 Adj. No. 3	4.2 7.0 11.2	4.9 9.1 14.0	5.6 11.2 16.8
Hourly B.T.U. input (Nat. & Manf. Gas)	Adj. No. 1 Adj. No. 2 Adj. No. 3	3,000 5,000 8,000	3,500 6,500 10,000	4,000 8,000 12,000
Gas Line (inches)		⅜	⅜	⅜
Water Lines (inches)		¾	¾	1
Flue (inches)		3	3	3

Capacities

Capacity: 20 gallons storage. Heat-speed on full burner 11.2 gallons an hour, 60 degree rise.

For: Small homes and families normally using between 30 and 70 gallons an hour, 60 degree rise. In general, for one bathroom houses.

No. 44-30

Capacity: 30 gallons storage. Heat-speed on full burner, 14 gallons an hour, 60 degree rise. In general, for one bathroom houses.

For: Average homes and families normally using between 50 and 90 gallons a day.

No. 46-50

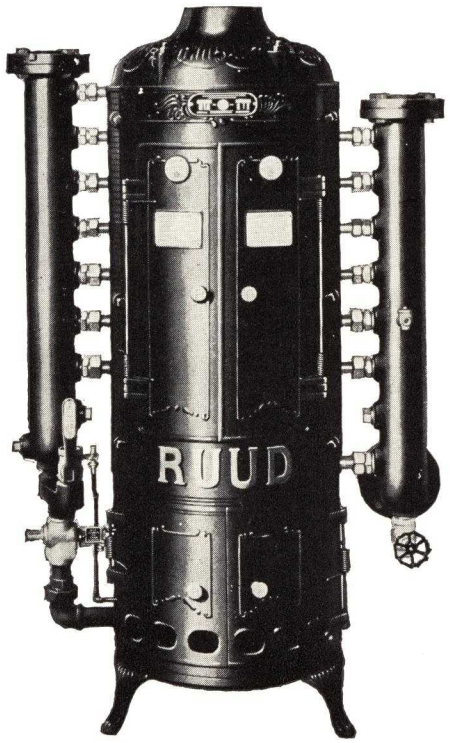
Capacity: 50 gallons storage. Heat-speed with full burner, 16.8 gallons an hour, 60 degree rise.

For: Larger homes and families normally using between 70 and 135 gallons a day. In general, for one and two bathroom houses. Ideal for certain classes of commercial installations.

Note:
See Back Cover for
Special Service to Architects

RUUD MULTI-COIL AUTOMATIC STORAGE WATER HEATER

27
48



Description

From this heavy-duty group, practically every requirement of Volume Water Heating can be met. Water is heated as it passes through copper coils and circulates through manifolds to and from the tank until the pre-set temperature is reached at which time the Moment Valve shuts off the flow of gas.

When the temperature drops through hot water withdrawals, the Moment Valve opens the gas line again and the heating operation is repeated. The automatic cycle is complete.

Extra ruggedness marks every detail of construction, a quality that is translated into a reliable and continuous hot water service at low cost for fuel and maintenance. Single or battery installations.

Features

RUUD Multi-Coil Automatic Storage Systems are made in four standard water heater sizes and range of storage tanks of many capacities, which are furnished as specified in black iron, galvanized steel and Ruud-a-loy (strengthened copper). Tanks with steam coils are supplied as ordered. Installations may be made singly (one water heater and one tank) or in battery (two or more water heaters connected to one tank).

Fuel control is close and economical through the RUUD All-Metal Moment Valve and Automatic Gas Cut-Off. Coils are heavy, premium copper; they are separate and independent so that removal of one for inspection or repair does not throw the equipment out of service. Porcelain-enameled manifolds. Two piece, easy-to-clean bunsen burners. Heavy shell. Extreme ruggedness characterizes the system throughout.

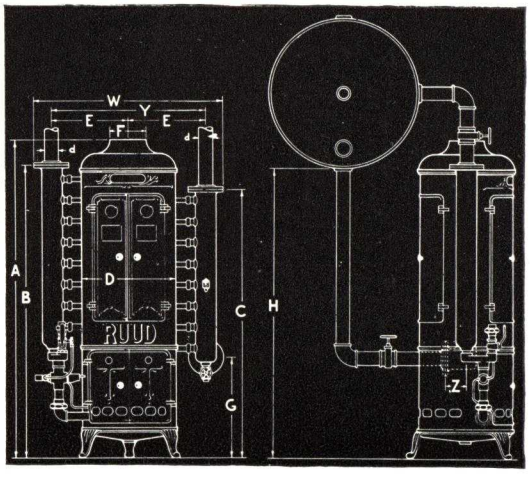
Where to Specify

For practically every heavy-duty water heating job except in those cases where hot water demands are intermittent and best served by a unit of intermittent action, — the RUUD Continuous Flow Water Heater. Large homes, apartment buildings and every manner of commercial and volume water heating can be perfectly supplied by the RUUD multi-coil group. Since requirements in this field are so varied and special, it is urged that the Ruud engineering department be called upon for specification help.

ROUGHING-IN DIMENSIONS (INCHES)

No.	100	200	350	500
A	45	53 3/8	61	64 1/8
B	41 3/4	49 1/2	56 1/4	58 1/2
C	37 3/4	45 1/2	52	53 1/2
D	12 1/2	16	18 1/2	20 1/2
E	10 3/4	13	14 3/4	15 3/4
F	5	6	7	8
G	17 1/4	18	19	18 1/2
H	41	49	56	58
d	1 1/2	2	2 1/2	2 1/2
W	27	32	36 1/2	38 1/2
Y	21 1/2	26	29 1/2	31 1/2
Z	3	3 1/2	4	4

Note: H equals minimum dimension.



GENERAL TABLE

Size	Heat Speed in Gallons per Hour 60° Rise		No. of Coil Sections	Size Manifold Connection	Size Gas Inlet	Size Flue Connection	Number of Burners	Orifice Natural Gas	Orifice *Manufactured Gas	Moment Valve Required	Moment Valve Tapping Required	Size of Gas Meter	Hourly B.T.U. Input	
	Natural Gas	Manufactured Gas											Natural	Artificial
100	107.7	111.9	6	1 1/2"	3/4"	5"	6	52	40	3/4"A	1 1/4"	20	77,000	80,000
200	215.4	223.8	7	2"	1"	6"	12	52	40	1"	1 1/4"	45	154,000	160,000
350	377.6	391.6	7	2 1/2"	1 1/4"	7"	21	52	40	1 1/4"	1 1/4"	60	270,000	280,000
500	538.5	559.4	8	2 1/2"	1 1/2"	8"	30	52	40	1 1/2"	1 1/2"	80	385,000	400,000

*Manufactured Gas Orifice varies with Specific Gravity, B.T.U. and Pressure of the Gas.

Capacities

No. 100

Capacity: Heat-speed at 60 degree temperature rise is 107.7 gallons an hour (natural gas) — 111.9 gallons an hour (manufactured gas). Furnished regularly with tanks of 80, 100 and 150 gallons storage capacity.

For: In general, homes having from three to five bathrooms, bedroom lavatories, large kitchen sink and laundry. Apartment buildings with six apartments of four and five rooms each.

No. 200

Capacity: Heat-speed at 60 degree rise is 215.4 gallons an hour (natural gas) — 223.8 gallons an hour (manufactured gas). Furnished regularly with tanks of 100, 150, 200, 250, and 300 gallons capacity, singly or in duplex.

For: In general, homes having five to eight bathrooms, large kitchen sink, dishwashing machine, large laundry. Apartment buildings with six to twelve apartments of five or six rooms each.

No. 350

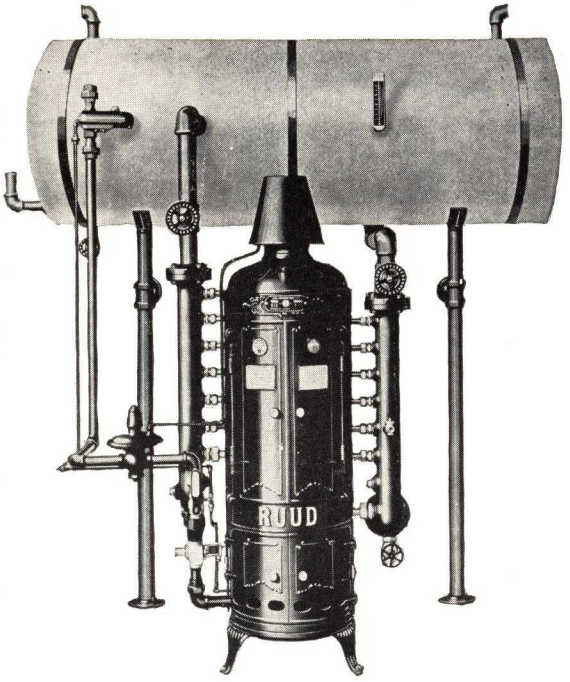
Capacity: Heat-speed at 60 degree rise is 377.6 gallons an hour (natural gas) — 391.6 gallons an hour (manufactured gas). Furnished regularly with tanks of 300, 365, 425, 500 and 600 gallons capacity, singly and in duplex.

For: In general, homes having seven to ten bathrooms, large kitchen sink, pantry sink, dishwashing machine, large laundry. Apartment buildings with ten to twenty apartments of five and six rooms each.

No. 500

Capacity: Heat-speed at 60 degree rise is 538.5 gallons an hour (natural gas) — 559.4 gallons an hour (manufactured gas). Furnished regularly with tanks of 425, 500, 600, 700, 800, 1,000, 1,200, 1,500, 1,800, 2,000, and 2,500 gallons capacity in black iron and galvanized. Ruud-a-loy (strengthened copper) tanks furnished up to 1,200 gallons capacity.

For: Single, duplex and triplex installations.



Note:

See Back Cover for

Special Service to Architects

RUUD THERMOSTATIC MOMENT VALVES

Size of Valve	Std. With Heater No.	Total Length	Length Inside Tank	Length Outside Tank	Tank Tapping Reqd.	Shipping Weight Lbs.	Weight Net Lbs.
3/4"-A	100	23 3/4"	15 1/2"	8 1/4"	1 1/4"	28	12
1"	200	32"	22"	10"	1 1/4"	45	22
	350						
1 1/4"	Duplex 200	32"	22"	10"	1 1/4"	65	29
	500						
1 1/2"	Duplex 350	42 1/2"	30 1/2"	12"	1 1/2"	70	32
2"	Duplex 500	42 1/2"	30 1/2"	12"	1 1/2"	75	39

Standard Combinations

Black and Galvanized Iron Standard Tank Combinations

Line No.	Number No. Heater	Capacity of Tank in Gallons	Number of Tank	Diam. of Tank	Length of Tank	Number of Heaters Tapped for	Cold Inlet to Tank	Hot Outlet from Tank	Size of Circulators	Line No.
1	100	80	1	20"	5'-0"	1	1 1/4"	1 1/4"	1 1/2"	1
2	100	100	2	22"	5'-0"	1	1 1/4"	1 1/4"	1 1/2"	2
3	100	150	4	24"	6'-4"	1	1 1/4"	1 1/4"	1 1/2"	3
4	200	100	5-B	22"	5'-0"	1	1 1/4"	1 1/4"	2"	4
5	200	150	7-B	24"	6'-4"	1	1 1/2"	1 1/2"	2"	5
6	200	200	8-B	24"	8'-6"	2	2"	1 1/2"	2"	6
7	200	250	9-B	30"	7'-0"	2	2"	1 1/2"	2"	7
8	200	300	10-B	30"	8'-0"	2	2"	1 1/2"	2"	8
9	350	300	16-B	30"	8'-0"	2	2 1/2"	2 1/2"	2 1/2"	9
10	350	365	17-B	30"	10'-0"	2	2 1/2"	2 1/2"	2 1/2"	10
11	350	425	18-B	36"	8'-0"	2	2 1/2"	2 1/2"	2 1/2"	11
12	350	500	19-B	36"	9'-6"	2	2 1/2"	2 1/2"	2 1/2"	12
13	350	600	20-B	42"	8'-6"	2	2 1/2"	2 1/2"	2 1/2"	13
14	500	425	21	36"	8'-0"	2	2 1/2"	2 1/2"	2 1/2"	14
15	500	500	22	36"	9'-6"	2	2 1/2"	2 1/2"	2 1/2"	15
16	500	600	23	42"	8'-6"	2	2 1/2"	2 1/2"	2 1/2"	16
17	500	700	24	42"	10'-0"	2	2 1/2"	2 1/2"	2 1/2"	17
18	500	800	25	48"	8'-6"	2	2 1/2"	2 1/2"	2 1/2"	18
19	500	1000	26	48"	10'-9"	2	2 1/2"	2 1/2"	2 1/2"	19
20	500	1200	27	48"	13'-0"	3	3"	3"	2 1/2"	20
21	500	1500	28	54"	12'-9"	3	3"	3"	2 1/2"	21
22	500	1800	29	54"	15'-3"	3	3"	3"	2 1/2"	22
23	500	1800	29-A	60"	12'-6"	3	3"	3"	2 1/2"	23
24	500	2000	30	54"	17'-0"	4	3"	3"	2 1/2"	24
25	500	2500	31	60"	17'-0"	4	3"	3"	2 1/2"	25

Above Tanks may be equipped with Steam Coils, Manholes and Handholes.

GALLONS PER HOUR DELIVERED BY RUUD MULTI-COIL STORAGE HEATERS

Size of Heater	TEMPERATURE RISE IN DEGREES F.														
	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
100	630	315	210	158	126	105	90	79	70	63	57	52.5	48.5	45	42
200	1260	630	420	315	252	210	180	157.5	140	126	114.5	105	90	79	84
350	2205	1102.5	734.5	551	441	367.5	315	275.5	244.5	220.5	200	183.5	169.5	157.5	147
500	3150	1575	1050	787.5	630	525	450	394	350	315	286	262	242	225	210

RUUD No. 75 MULTI-COIL AUTOMATIC STORAGE WATER HEATER

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GENERAL TABLE

No.	Size Moment Valve	Heat Speed Gallons Per Hour 60° Rise	Hourly B.T.U. Input Nat. and Man. Gas	Gas Line	Water Lines	Flue
75	¾"	77	55,000	½"	1½"	4"

Capacities

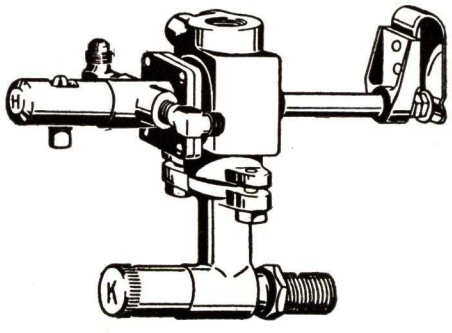
No. 75

Capacity: Heat-speed at 60 degrees temperature rise is 77 gallons of hot water an hour. Furnished regularly with tanks of 60, 80, and 100 gallons, but can be connected to tanks of other sizes, singly and in duplex.

For: Large homes having from three to five bathrooms. Apartment buildings with four apartments of four and five rooms each. For many commercial and volume water heating requirements.

RUUD AUTOMATIC GAS CUT-OFF

The cut-off that is standard equipment on the RUUD No. 75 Multi-Coil Water Heater is the same as used in RUUD Multi-Coil Automatic Storage Systems. Setting it and lighting the pilot burner takes but a few seconds. Thereafter, the operation is automatic. The hot thermostatic metal holds both pilot and main gas valve open; if the pilot flame goes out, the metal cools and automatically closes both the main and pilot gas valves. Needle valve adjustment is also shown.



Description

This new unit is specially designed and built for the conversion of heavy-duty coal or oil-fired systems to gas by connection, in unit or battery, to the existing storage tank. It is also supplied complete with water heater and a new RUUD tank (black iron, galvanized or Ruud-a-loy strengthened copper).

Operation follows the principle of the RUUD Multi-Coil Automatic Storage System — the automatic heating of water to balance the hot water withdrawals from the tank. The gas control — the RUUD Moment Valve — is reliable and positive-acting, holding the main gas valve fully open or completely closed, without gas-wasting midway positions.

To users of solid and liquid fuels in large residences, institutions, office buildings, loft buildings, factories, etc., the RUUD No. 75 provides the quickest and cheapest method of utilizing gas for water heating.

Features

Made in one size only, with a heat-speed (60° temperature rise) of 77 gallons of hot water an hour. Single or duplex installations. In single installations, RUUD No. 75 should be connected to tanks of 60, 80 or 100 gallons capacity.

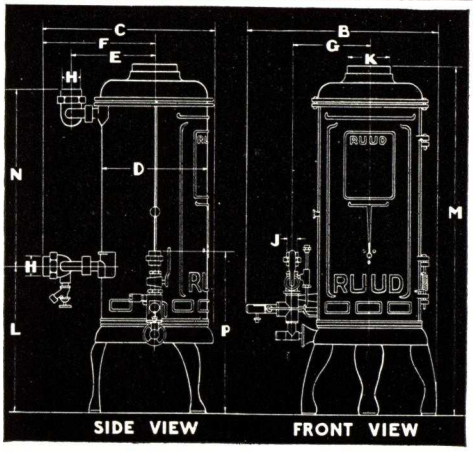
The RUUD All-Metal Moment Valve, which turns gas on and off as fuel is or is not required, provides automatic economical regulation of gas consumption and stored water temperature. A secondary fuel control is the RUUD All-Metal Automatic Gas Cut-Off which closes all gas lines if the pilot flame is extinguished. There are three coils, made from heavy premium copper tubes, and so staggered as to baffle the heat most effectively. A quick-speed unit bunsen burner is equipped with a needle valve adjustment and an adjustable air shutter. Manifolds are brass. Jacket is heavy cast iron, insulated with rock-wool around the heat zone. Rugged construction throughout.

Where to Specify

For homes and other buildings where hot water requirements fall within the capacity of the RUUD No. 75. This model has many commercial uses and is an inexpensive way of switching from other fuels to gas, and utilizing the present storage tank.

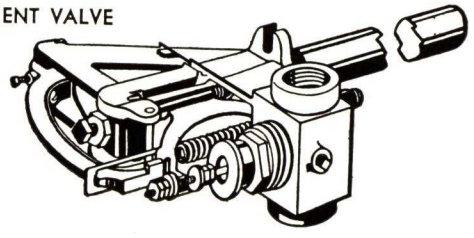
ROUGHING-IN DIMENSIONS (INCHES)

Number	75
B	20
C	18¼
D	11⅞
E	8½
F	11¾
G	8⅜
H	1½
J	½
K	4
L	16⅝
M	39½
N	21¾
P	18⅝
R	46¼



RUUD ALL-METAL MOMENT VALVE

The RUUD All-Metal Moment Valve is sold as standard equipment with the RUUD No. 75 Multi-Coil Water Heater. It holds the main gas valve to two positions, full-open or completely closed so that gas burns at its highest efficiency or not at all. Flue losses due to graduations of gas flame are entirely eliminated. It is a thoroughly reliable fuel control.



Description

This type provides an instant, continuous, uninterrupted flow of uniformly tempered water. The action is controlled entirely by the faucets opening and closing, plus the automatic temperature regulation of the internal thermostat.

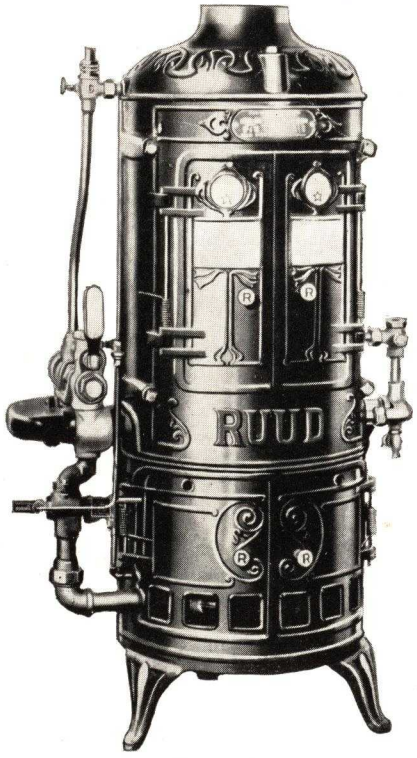
The heating action is instant. Opening the faucet starts gas burning and water flows at once through long copper coils which are enveloped in hot gases, so that water entering the machine cold, is hot when it leaves. Closing the faucet stops the machine's operations automatically.

Features

Five sizes with capacities ranging from 2-plus to 8 gallons a minute can care for a large majority of home and commercial hot water requirements, and when installed in battery, for even the largest demands. Two separate and independent gas valves, one actuated by water flow and the other by water temperature. Thermostat is in the heart of the heat zone and instantly responsive to temperature changes. All-metal automatic gas cut-off. Coils are seamless, premium copper, baffle-wound. Two piece, easy-to-clean burners. Waterways are brass and copper, assuring rust-free hot water. Heavy cast-iron shell. Long-life construction.

Where to Specify

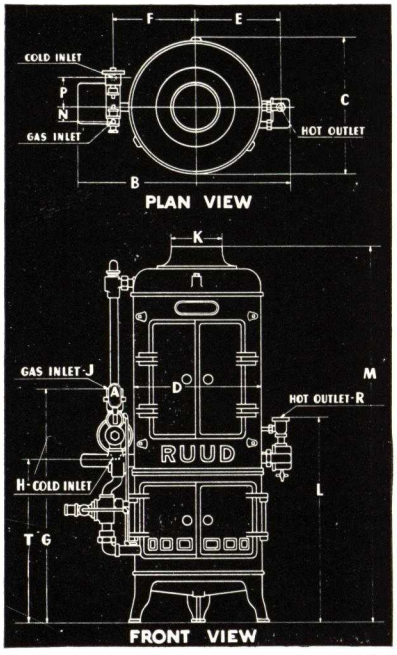
This is a tankless system without stand-by losses. It is ideal for all homes and buildings where instant, inexhaustible and rust-free hot water is desired, — for intermittent demands where hot water storage would be wasteful (shower rooms of athletic plants, autowash stations, soda fountains, etc.), — for draws over a long period that would exhaust a tank supply, — and for water conditions that corrode iron and steel tanks quickly. This type is extremely flexible and installed singly or in battery, there are but few hot water demands that it cannot care for.



GENERAL TABLE

Number	95	3	4	6	8
Capacity in gallons per Minute (63° rise)	2 plus	3	4	6	8
Hourly B.T.U. input					
Nat. Gas	92,000	110,000	137,500	220,000	275,000
Manf. Gas	97,000	116,000	145,000	232,000	290,000
Gas Line (inches)	¾	1	1¼	1½	2
Cold Water Line (inches)	½	½	½	¾	¾
Hot Water Line (inches)	½	½	½	¾	1
Flue (inches)	5	6	6	7	8

Note: 25 pounds minimum water pressure required for standard water heaters. From 5 to 25 pounds use the low pressure type supplies in the No. 4, 6, and 8 sizes where pressure is below five pounds, use the storage type.



ROUGHING-IN DIMENSIONS (INCHES)

Number	95	3	4	6	8
B	21 7/8	25 1/2	27 1/4	30 1/4	32 3/8
C	16 1/2	17 1/2	19	22 1/2	23 1/2
D	13 7/8	14 1/2	16 3/8	19	21 1/4
E	9 3/8	10 1/8	11 1/8	12 3/8	13 3/8
F	9 1/4	10	10 3/4	12 3/8	13 3/4
G	16 3/4	29 1/4	31	33 1/2	33 3/4
H	1/2	1/2	1/2	3/4	3/4
J	3/4	1	1 1/4	1 1/2	2
K	5	6	6	7	8
L	19 3/4	26 1/2	27 1/2	28 5/8	29 1/2
M	42 5/8	45 1/2	47 1/4	55 1/2	58 1/2
N		2 1/4	2 1/4	2 3/8	2 3/8
P		3 1/2	3 1/2	3 1/2	3 1/2
R	1/2	1/2	1/2	3/4	1
S	49 3/8	53 1/4	55	63 1/4	67 1/4

Capacities

No. 95. Capacity: Two gallons plus a minute, 63 degree temperature rise. For: Very small homes with compactly arranged fixtures.

No. 3. Capacity: Three gallons a minute, 63 degree temperature rise. For: Small homes having ordinary bathroom, kitchen and laundry fixtures.

No. 4. Capacity: Four gallons a minute, 63 degree temperature rise. For: Average, modern homes having kitchen, one or two bathrooms and laundry.

No. 6. Capacity: Six gallons a minute, 63 degree temperature rise. For: Homes with two or three bathrooms and other fixtures in proportion. For small duplex apartments.

No. 8. Capacity: Eight gallons a minute, 63 degree temperature rise. For: Large homes with from three to five bathrooms and other fixtures in proportion. Also for small hotels, apartment houses and restaurants. Note: This is only a general guide to be supplemented by study of individual requirements. In addition to residences, this type has wide application in commercial building. Ask for RUUD specification help.

CAPACITIES OF CONTINUOUS FLOW WATER HEATERS
TEMPERATURE RISE IN GPM

Number	50°	60°	70°	80°	90°	100°	110°	120°	130°	140°	150°
95	3.15	2.62	2.25	1.97	1.75	1.58	1.43	1.31	1.21	1.12	1.05
3	3.78	3.15	2.70	2.36	2.10	1.89	1.72	1.58	1.45	1.35	1.26
4	5.05	4.20	3.60	3.15	2.80	2.52	2.29	2.10	1.94	1.80	1.68
6	7.58	6.30	5.40	4.73	4.20	3.87	3.52	3.23	2.98	2.76	2.58
8	10.10	8.40	7.20	6.30	5.60	5.04	4.59	4.20	3.88	3.60	3.36

Note: See Back Cover for Special Service to Architects

RUUD

Engineering and Specification Service

★

The largest line of gas water heaters in the world is trade-marked "RUUD." Any hot water requirements that can be met by gas, can be met by some type and size in the RUUD line, whether that requirement be for one faucet or a thousand.

There are so many varieties of hot water demands, many of which have their own individual problems, that you are urged to accept the no-charge, no-obligation services of the RUUD engineering department in specification and installation problems.

If you live in a large city, consult your phone book for the name and address of a RUUD representative. If not, write direct to . . .

★

RUUD MANUFACTURING COMPANY
PITTSBURGH, PA.

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SECTION 27

CONTINUED ⟶

TACO HEATERS, INCORPORATED

342 Madison Avenue, NEW YORK, N. Y.

TACO HEATERS, INCORPORATED offers a complete line of water heating specialties for domestic hot water supply on steam and vapor *(Taco-Abbott System)* and hot water boilers *(Taco-Trol System and Equipment)*. Taco products are catalogued in four sections:

Section 1—Heaters to be connected to boilers which do not have Biltin Taco Heaters. These heaters range in heating capacity from a 30-gal. tank to a 5,000-gal. tank. *External Tankless Taco Heaters* for the average home, restaurant, etc., and *Taco Tempering Valves* are included in this section.

Section 2—*Taco-Trol* equipment designed for use with a forced circulation one-pipe or two-pipe hot water heating system.

Section 3—*Factory shipment items:* Biltin Tacos for installation with steel boilers for use both with and without storage tank. Oil Preheaters; Taco Converters; Instantaneous Heaters for use with live steam on large apartment houses, hotels and factories.

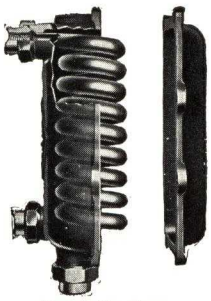
Section 4—*Special Biltin Taco Heaters* for use with cast iron and steel boilers. These heaters have aided materially the modernization of oil burning and stoker fired boilers. Taco pioneered this field and Biltin Tacos have been adopted as standard equipment by leading manufacturers.

TACO-ABBOTT SYSTEM

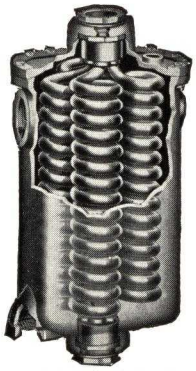
For Domestic Hot Water Supply on Steam and Vapor Systems The Taco-Abbott System makes possible the efficient year 'round operation of a steam or vapor heating boiler to supply domestic hot water.

This *patented* system provides for the automatic control of the heating boiler in summer so that when the room temperature reaches the desired point, the control of the firing device is transferred from the room thermostat to the aquastat, which is operated by the water in the boiler. This aquastat controls the boiler water at a sufficiently high temperature to heat the domestic water without producing heat in the radiators.

Thus the Taco-Abbott System eliminates the necessity of a separate domestic water heater in summer. This means lower fuel bills. Also by operating the automatic firing device in summer, the heating system is "exercised," insuring longer life, preventing rusting of parts and damp cellars.



Domestic Taco



Multi-Coil Taco

CAPACITIES, DIMENSIONS AND SHIPPING WEIGHTS OF TACO HEATERS

Size of Taco	Capacities: Gallons in 3 hours heated from 40° F. to 140° F. — Taco below water line: Boiler water at 212° F.	Capacities: Gallons in 3 hours heated from 40° F. to 140° F. — Taco below water line: †Boiler water from 160° to 190° F.	Capacities: Gallons in 3 hours heated from 40° F. to 140° F. — Taco on steam of 0 lbs. gauge pressure	Capacities: Square feet hot water radiation — Taco* below water line boiler at 212° F.	Capacities: Square feet hot water radiation — Taco** on steam of 0 lbs. gauge pressure	Size of Taco	Pipe connection: Boiler conn., in.	Pipe connection: Tank conn., in.	Height, in.	Diameter, in.	Shipping weight, lbs.
A	B	C	D	E	F	G	H	I	J	K	L
DOMESTIC TACO											
00	30	.....	.....	.....	.....	00	1	¾	8½	5½	10
0	30	.....	40	15	20	0	1	¾	8¾	5½	10
30	30	.....	50	20	30	30	1	¾	10	5½	12
1	40	.....	75	30	50	1	1	¾	12	5½	14
1A	52	30	100	40	65	1A	1	¾	15	5½	18
1B	66	30 to 40	125	50	85	1B	1¼	1	14	7½	22
2	82	40 to 52	150	60	100	2	1¼	1	16½	7½	27
2A	100	52 to 66	175	75	125	2A	1¼	1	18¾	7½	31
2B	120	66 to 82	225	90	150	2B	1¼	1	21¼	7½	34
2C	144	82 to 100	275	105	175	2C	1½	1	19½	9	50
3	160	100 to 120	300	120	200	3	2	1¼	21¾	9	65
3A	200	120 to 144	375	150	250	3A	2	1¼	26	9	80
MULTI-COIL TACO											
M 60	250	120 to 185	450	210	300	M 60	2	1½	11	9¾	80
M 75	300	150 to 220	600	250	400	M 75	2	1½	13½	9¾	85
M100	400	200 to 300	750	320	500	M100	2½	2	13½	12	125
M125	500	250 to 360	900	420	600	M125	2½	2	15¾	12	140
M150	600	300 to 430	1200	500	800	M150	3	2½	16	14⅞	210
M200	800	400 to 570	1500	640	1000	M200	3	2½	20⅜	14⅞	250
Multi-Coil height represents measurement between supply and return connections to the Boiler.											
SUPER TACO											
20	1000	500 to 645	1500	640	1000	20	4	2½	45	11¾	280
25	1250	625 to 860	1875	800	1250	25	4	2½	54	11¾	350
35	1750	1075 to 1150	2625	1100	1750	35	4	4	55	14¼	500
50	2500	1250 to 1760	3750	1600	2500	50	5	4	77	14¼	685
75	3750	1875 to 2600	5625	2400	3750	75	5	5	81	19	1050
100	5000	2500 to 3400	7500	3200	5000	100	6	6	84	21	1250
TACO NOS. 4, 5, 6											
4	320	160 to 220	600	250	400	4	2	2	28½	10	100
5	640	320 to 450	1200	500	800	5	2½	2½	41	12	190
6	960	480 to 645	1800	800	1200	6	3	3	43¾	13½	280

*Based on 120° F. inlet temp. to heater and 160° F. outlet temp.
**Based on 140° F. inlet temp. to heater and 180° F. outlet temp.
†Automatically fired installations—Taco-Abbott System for year 'round operation.

Tankless Taco
Nos. 14, 15 and 18

TANKLESS TACO NOS. 14 AND 16

No. 14—One or small two-bath residences.
Nos. 15 and 16—One to three baths.
No. 18—Two to four baths.

Size of Taco	Capacity gal. in 1 hour heated 40°F. to 140° F. — Boiler water at 180° F.: Per min.	Capacity gal. in 1 hour heated 40°F. to 140° F. — Boiler water at 180° F.: Per hour	Boiler conn., in.	Water conn., in.	Height by length, in.	Shippng weight, lbs.
14	3	180	2	½	14½x18¼	115
15	4	240	2	½	14½x20¼	141
16	4½	270	2	¾	21 x13½	165
18	5	300	2½	¾	17 x22	185

TACO TEMPERING VALVE

Recommended especially for use in the Tankless Taco. Can be set with reasonable accuracy for temperatures ranging from 135° to 200° F.

Size, in.	Length, in.	Shipping weight, lbs.
½	8 5/16	7
¾	8½	7
1	8½	7
1¼ or 1½	9	10
2	9	13

TACO TANKS

Tank					Unit		Capacities, gallons in 1 hour			
			Gauge metal galvanized				Heated from 50° to 150° F. below water line			
Capacity, gal.	Size, in.	Conn., in.	Shell	Head	Heating surface, sq. ft.	Conn., in.	Boiler water at 212° F.	Boiler water at 180° F.	Heated from 50° to 180° F. steam of 0 lbs. gauge pressure	Shipping weight, lbs., galvanized
40	16 x 48	6-1	10 ga.-9/64	7 ga.-3/16	6	2	80	40	120	167
52	16 x 60	6-1	10 ga.-9/64	7 ga.-3/16	6	2	80	40	120	190
66	18 x 60	6-1	10 ga.-9/64	7 ga.-3/16	6	2	80	40	120	211
82	20 x 60	6-1½	10 ga.-9/64	7 ga.-3/16	7½	2	100	50	150	260
100	22 x 60	6-1½	9 ga.-5/32	7 ga.-3/16	7½	2	100	50	150	301
120	24 x 60	6-1½	7 ga.-3/16	3 ga.-¼	7½	2	100	50	150	389
144	24 x 72	6-1½	7 ga.-3/16	3 ga.-¼	9	2	120	60	180	444
180	30 x 60	6-1½	7 ga.-3/16	3 ga.-¼	13½	3	180	90	270	590

Galvanized (copper bearing steel) 300 lbs. test pressure; 127½ lbs. working pressure. Copper, Monel or Everdur 250 lbs. test pressure; 106¼ lbs. working pressure.

TACO-TROL EQUIPMENT

Heating Specialties for Hot Water Boilers

Taco Standard Circulator

Taco Standard Circulators

Made in five sizes, 1, 1½ and 2-in. direct drive, 3-in. belt driven with either 3 or 4-in. impeller. Regularly furnished 110-volt, 60-cycle capacitor motors.

Circulator size, in.	Capacities radiation, sq. ft.		Gallons circulated per minute	Domestic hot water storage tanks, gal.	Dimensions, in.		Motor hp.
	Taco-Trol one-pipe system	Two-pipe system			Face to face of flanges	Over-all height, approx	
1	750	500	15	1,000	7¾	18½	⅛
1½	1000	800	30	1,500	8¼	18½	⅛
2	2000	2000	60	2,000	9	19½	⅙
3A	4000	4000	100	3,000	13¼	18¾	⅛
3B	5000	5000	130	4,000	13¼	18¾	½

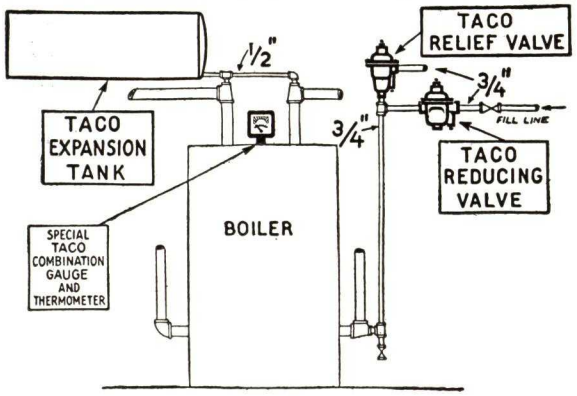
The Taco Check Valve

The Taco Check Valve is a high grade, carefully balanced flow valve of the angle type; (except in the 3-in. size). Taco Check Valves are made in sizes which correspond to the Taco Circulator. They are mounted directly on the riser, and take the place of an elbow.

Taco Check Valve

TACO TANK-IN-BASEMENT SYSTEM COMBINATIONS

Taco Tank-in-Basement Systems

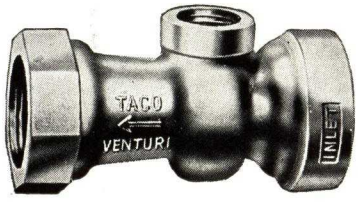


Taco Tank-in-Basement System is a closed system which increases circulation and makes it possible to operate the system at a much higher temperature. May be installed on old and new jobs. Taco expansion tanks are furnished in sizes of 18, 24, 30 and 40 gal.

	Description
Class A System	Taco Expansion Tank, ¾ in. Taco Reducing Valve R-20 ¾ in. Taco Relief Valve R-1 and ½ in. Taco Gauge
Class B System	Taco Expansion Tank, ¾ in. Taco Relief Valve R-1, and ½ in. Taco Gauge
Class C System	Taco Expansion Tank, ¾ in. Taco Relief Valve R-1 and ¾ in. Taco Reducing Valve R-20
Class D System	Consists of Taco Expansion Tank and ¾ in. Taco Relief Valve R-1

"TACO-ONE" VENTURI SYSTEM

For One-pipe Hot Water Heating



Taco Venturi Fitting—The Taco Venturi Fitting is a return fitting designed for use as a part of the "Taco-One" Venturi System for one-pipe hot water heating with the Taco Hy-Duty Circulator. The Taco Venturi Fitting is made in five sizes of cast iron and two sizes of bronze and may be used with radiators above or below the main. A common tee is used as a supply to the radiators.

When used with the Taco Hy-Duty Circulator a maximum number of 12 1-in. Taco Venturi fittings can be installed on a single circuit with maximum length of 100 ft., to handle up to 500 sq. ft. of radiation. A maximum number of 12 1¼-in. fittings on a single circuit with main not over 125 ft. in length will handle up to 1000 sq. ft. On jobs up to 1000 sq. ft. with unusually long runs of main (over 125 ft.) the 1½-in. Taco Venturi fitting should be used. 1¼-in. Taco Venturi Fitting is designed to handle up to 100 sq. ft. of radiation in a single radiator above the main, or in two radiators above the main, with a total of 80 sq. ft., one of which is connected as a branch to the radiator connections of the other. The fitting will also handle 80 sq. ft. on a single radiator below the main.

Taco Hy-Duty Circulator—A super-efficient circulating unit designed to deliver more water and to operate efficiently against higher heads than the standard circulators. Taco Hy-Duty Circulator will deliver 20 gal. per minute against a 10-ft. head which is equivalent to a 20 degree temperature drop, to 200,000 B.t.u. Regularly furnished with 1½-in. flanges.

THE WHITLOCK COIL PIPE COMPANY

Manufacturers and Engineers
HARTFORD, CONN.

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Products

Manufacturers of STORAGE HEATERS; INSTANTANEOUS HEATERS; FEED WATER HEATERS; FUEL OIL HEATERS; HEAT EXCHANGERS; SWIMMING POOL HEATERS; CONDENSATION OR DRIP COOLERS; CONVERTORS (hot water heating systems); PREHEATERS (reclaiming waste heat from used process liquids); COILS and BENDS of any size and shape from pipe or tubing.

WHITLOCK HEAT TRANSFER EQUIPMENT

Engineering Service

In some city near you there is a Whitlock representative qualified and ready to give personal service in connection with heat transfer problems; or sample specifications, installation blueprints, etc., will be mailed on request.

Descriptive bulletins are also available. Write fully so that reply can be as specific as possible.

TYPE "K" STORAGE HEATERS

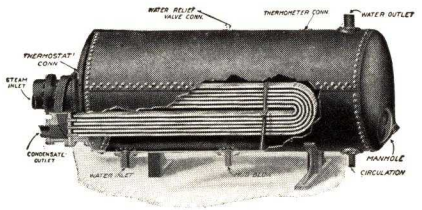


Fig. 1. Type "K" Horizontal Storage Heater

(1) Provide ample hot water at all times. (2) Use "waste" heat from exhaust steam, hot drips, and other condensation returns. (3) If necessary, use live steam, under thermostatic control, to supplement waste heat. (4) Where live steam only is available, Type "K" takes steam at nearly uniform rate—avoiding peak steam requirements.

Heaters Available in Several Designs

Type "K" Heaters are furnished for horizontal installation, vertical installation, and in the combination design (either horizontal or vertical) with one exhaust steam (or condensation cooling) section and another section using live steam under thermostatic control. So-called "Submerged" heaters are installed just below the water line so that heating is actually done by hot water instead of steam.

Type "K" heaters are also available with three shell materials:

Type "K" Everdur—With a shell of solid Everdur. A high strength, copper rich alloy giving absolute assurance against corrosion with consequent clear hot water, and practically unlimited life.

Type "K" Eterno—With outer shell of steel and inner shell of pure sheet copper. Also insures clear hot water and long life.

Type "K" Standard with Steel Shell—The standard, low cost, storage heater in use in thousands of buildings of all kinds. Furnished with or without interior enamel coating.

Heating section consists of removable unit of seamless copper tube U-bends, properly supported within shell.

TABLE A. WHITLOCK TYPE "K" STORAGE HEATERS (HORIZONTAL)

Shells												Heating sections						
No.	Gallons—one filling	Diam., in.	Length, in.	Thickness of shell, in.	Thickness of head, in.	Weight, lbs.	Water inlet and outlet, in.	Mud blow, in.	Circulation, in.	Height, standard cradles, in.	Height, pipe leg cradles, in.	No.	Gal. per hour 40-180° Steam at 0 lbs.	Smallest shell into which section will fit, in.	Weight of entire section, lb.	Diam. of headport, in.	Max. and std. steam inlet, in.	Max. and std. condensation
1	60	18	60	1/4	3/8	400	2	2	...	4	2	H0	100	18x48	75	9 1/4	2	1
2	75	18	72	1/4	3/8	450	2	2	...	4	2	H1	150	18x60	80	9 1/4	2	1
3	110	24	60	1/4	3/8	600	2	2	...	6	2 1/2	H2	200	18x72	90	9 1/4	2	1
4	130	24	72	1/4	3/8	700	2	2	...	6	2 1/2	H3	250	18x48	175	12 1/2	3 1/2	2
5	150	24	84	1/4	3/8	800	2	2	...	6	2 1/2	H4	300	18x48	185	12 1/2	3 1/2	2
6	170	30	60	1/4	3/8	750	3	2	...	7	3	H5	350	18x60	190	12 1/2	3 1/2	2
7	200	30	72	1/4	3/8	850	3	2	...	7	3	H6	400	18x60	200	12 1/2	3 1/2	2
8	240	30	84	1/4	3/8	950	3	2	...	7	3	H7	500	18x72	210	12 1/2	3 1/2	2
9	280	30	96	1/4	3/8	1050	3	2	...	7	3	H8	550	18x72	215	12 1/2	3 1/2	2
10	340	36	84	5/16	1/2	1300	3	2	...	8	3 1/2	H9	600	18x84	220	12 1/2	3 1/2	2
11	400	36	96	5/16	1/2	1450	3	2	...	8	3 1/2	H10	700	24x60	300	15 1/4	5	2
12	450	36	108	5/16	1/2	1600	3	2	...	8	3 1/2	H11	800	18x96	260	12 1/2	3 1/2	2
13	500	36	120	5/16	1/2	1800	3	2	2	8	3 1/2	H12	900	18x108	270	12 1/2	3 1/2	2
14	530	42	96	5/16	1/2	1850	4	2	...	8	3 7/16	H13	1000	18x120	285	12 1/2	3 1/2	2
15	680	42	120	5/16	1/2	2150	4	2	2	8	3 7/16	H14	1250	24x84	370	15 1/4	5	2
16	800	42	144	5/16	1/2	2500	4	2	2	8	3 7/16	H15	1500	24x108	425	15 1/4	5	2
17	970	42	168	5/16	1/2	2900	4	2	2	8	3 7/16	H16	1750	24x120	450	15 1/4	5	2
18	870	48	120	3/8	1/2	2850	4	2	2	9	4	H17	2000	30x96	570	18 1/4	6	2 1/2
19	1050	48	144	3/8	1/2	3250	4	2	2	9	4	H18	2400	30x120	620	18 1/4	6	2 1/2
20	1250	48	168	3/8	1/2	3700	4	2	2	9	4	H19	2800	30x132	670	18 1/4	6	2 1/2
21	1400	48	192	3/8	1/2	4100	4	2	2	9	4	H20	3200	36x96	860	21	8	2 1/2
22	1100	54	120	3/8	1/2	3250	4	2	2	9	4 1/2	H21	3600	36x108	920	21	8	2 1/2
23	1300	54	144	3/8	1/2	3700	4	2	2	9	4 1/2	H22	4000	36x120	950	21	8	2 1/2
24	1500	54	168	3/8	1/2	4200	4	2	2	9	4 1/2	H23	4400	36x132	1020	21	8	2 1/2
25	1800	54	192	3/8	1/2	4700	4	2	2	9	4 1/2	H24	4800	36x96	1200	24	10	3
26	1300	60	120	7/16	9/16	4300	4	2	2	10	4 1/2	H25	5400	36x108	1300	24	10	3
27	1600	60	144	7/16	9/16	4900	4	2	2	10	4 1/2	H26	6000	36x120	1380	24	10	3
28	1900	60	168	7/16	9/16	5600	4	2	2	10	4 1/2	H27	7000	42x96	1950	30	12	4
29	2200	60	192	7/16	9/16	6200	4	2	2	10	4 1/2	H28	8000	42x96	2000	30	12	4
30	2300	72	144	7/16	9/16	5700	4	2 1/2	2 1/2	8	8	H29	9000	42x108	2300	30	12	4
31	2700	72	168	7/16	9/16	6400	4	2 1/2	2 1/2	8	8	H30	10000	42x108	2460	30	12	4

How to Select Proper Size Heater

An example, using Table B of fixture capacities, and Table A of sizes will illustrate method used: Consider a gymnasium as a simple example.

Private lavatories	50 @ 2 gals. each	100 gals. per hr.
Public lavatories	20 @ 8 gals. each	160 gals. per hr.
Bathtubs	6 @ 30 gals. each	180 gals. per hr.
Foot basins	20 @ 12 gals. each	240 gals. per hr.
Showers	30 @ 75 gals. each	2250 gals. per hr.
Maximum hourly requirements, total		2930 gals. per hr.

Multiplying this 2930 total by 40% (hourly heating capacity factor from table) equals 1172 gals. per hour.

Storage capacity equals this 1172 gals. multiplied by storage capacity factor from table — 100% — or 1172 gals.

Table A shows shell size of No. 20 equals 1250 gals. storage; heating section No. H14 also has 1250 gals., capacity. Proper heater would be Whitlock Type "K" No. 20H14.

Bulletin 40 contains full details.

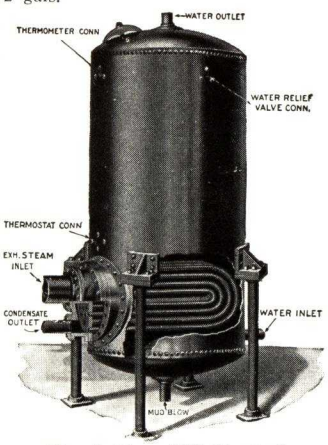


Fig. 2. Type "K" Vertical Storage Heater

TABLE B. HOT WATER FIXTURE CAPACITIES FOR VARIOUS TYPES OF BUILDINGS

Figured at a final temperature of 180° F. Gallons of water per hour per fixture

	Apartment house	Club	Gymnasium	Hospital	Hotel	Industrial plant	Office building	Public bath	Private residence	School	Y. M. C.A.
Basins, private lavatory	2	2	2	2	2	2	2	2	2	2	2
Basins, public lavatory	4	6	8	6	8	12	6	12	..	15	8
Bathtubs	20	20	30	20	20	30	..	45	20	..	30
Dishwashers	15	50–150	..	50–150	50–200	20–100	..	..	15	20–100	20–100
Foot basins	3	3	12	3	3	12	..	..	3	3	12
Kitchen sink	10	20	..	20	20	20	..	..	10	10	20
Laundry, stationary tubs	20	28	..	28	28	..	..	..	20	..	28
Pantry sink	5	10	..	10	10	..	..	..	5	10	10
Showers	75	150	225	75	75	225	..	225	75	225	225
Slop sink	20	20	..	20	30	20	15	15	15	20	20
Hourly heating capacity factor	30%	30%	40%	25%	25%	40%	30%	50%	30%	40%	40%
Storage capacity factor	125%	90%	100%	60%	80%	100%	200%	120%	70%	100%	100%

INSTANTANEOUS HEATERS

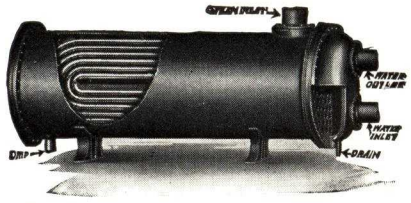


Fig. 3. Whitlock Type R Instantaneous Heater, U-bend Pattern

Whitlock Instantaneous Heaters

Uses—Instantaneous Heaters are made of different designs for different uses, with materials used depending on service. Such uses include heating water in storage tanks; convertors; swimming pool heaters; fuel oil heaters; and, of special design but similar, as heat exchangers and condensation or drip coolers and preheaters (reclaiming heat from waste hot liquids).

Three models of instantaneous heaters as follows:

Type R—Heating section composed of U-bends of seamless copper tubing firmly expanded into a rolled steel tube sheet. Recommended for all usual conditions, as it is of simple construction and allows for unlimited expansion and contraction. Standard shells are of cast iron on smaller sizes and steel on larger sizes but can be made to suit working conditions. Bulletin 25-SA sent on request.

Type AC—Heating section is one or more helical copper coils and water heated comes into contact only with copper or bronze. Of value, too, in heating liquids which corrode iron or steel. Write for Bulletin 24-SA.

Type S—Similar to Type R, except that heating section is made up of straight tubes with one end expanded into a rigid tube sheet and the other end expanded into a floating tube sheet to allow for expansion and contraction. These heaters are used where water deposits a large quantity of mud or scale-forming materials and tubes must be cleaned frequently. Bulletin 26-SA on request.

TABLE C. TYPE "R" HEATERS STANDARD SIZES, CAPACITIES, DIMENSIONS AND WEIGHTS

Sizes, capacities, and weights of Type "R" Heaters, the type most commonly used. Type "S" Heaters—from 6 to 25 only—are *approximately* the same size and capacity as the Type "R" of the same size number. Tables of Type "R" Junior will be mailed on request.

Size No.	Gravity Circulation 2-pass, temp. range 40° F. to 180° F. steam at 0 lb.						Forced Circulation Multi-pass, temp. range 40° F. to 180° F. steam at 0 lb.					
	Capacity gal. per hr.	Over-all length, in.	Shell diam., in.	Water connections, in.	Steam connections, in.	Weight, lb.	Capacity, gal. per hr.	Over-all length, in.	Shell diam., in.	Water connections, in.	Steam connection, in.	Weight, lb.
0	26	11 3/8	7	3/4	1	80	25	15 3/8	7	3/4	1	90
1	50	14 3/8	7	1	1 1/4	90	60	26 3/8	7	3/4	1 1/4	125
2	80	19 3/8	7	1 1/4	1 1/2	110	150	37 3/8	7	3/4	1 1/2	160
3	105	23 3/8	7	1 1/4	1 1/2	130	200	39 1/2	9 1/2	1	1 1/2	280
4	130	29 3/8	7	1 1/4	1 1/2	145	250	48 1/2	9 1/2	1	2	325
5	155	34 3/8	7	1 1/2	2	170	300	31 3/4	9 1/2	1	2	250
6	205	24 3/4	9 1/2	1 1/2	2	240	400	40 3/4	9 1/2	1 1/4	2 1/2	300
7	260	30 3/4	9 1/2	1 1/2	2	270	500	43 3/4	9 1/2	1 1/4	3	325
8	310	35 3/4	9 1/2	2	2 1/2	300	600	48 3/4	9 1/2	1 1/4	3	350
9	410	43 3/4	9 1/2	2	2 1/2	360	800	52	12	1 1/2	3 1/2	575
10	515	55 3/4	9 1/2	2 1/2	3	420	1000	61	12	1 1/2	3 1/2	645
11	650	45	12	2 1/2	3	610	1250	74	12	1 1/2	4	760
12	775	52	12	3	3 1/2	670	1500	59 7/8	15	2	5	870
13	1030	67	12	4	4	810	2000	72 7/8	15	2	5	1020
14	1290	51 7/8	15	4	4	930	2500	59	17	2 1/2	6	1035
15	1550	59 7/8	15	4	5	1040	3000	71	17	2 1/2	6	1175
16	2060	59	17	5	5	1320	4000	89	17	2 1/2	8	1420
17	2540	71	17	5	6	1510	5000	74 7/8	20	3	8	1910
18	3100	61 7/8	20	6	6	1940	6000	88 7/8	20	3	10	2185
18 1/2	3620	70 7/8	20	6	8	2100	7000	101 7/8	20	3	10	2475
19	4120	78 7/8	20	6	8	2300	8000	64 5/8	26	4	10	2800
19 1/2	4650	59 5/8	26	8	8	2870	9000	71 5/8	26	4	10	3000
20	5160	64 5/8	26	8	8	3020	10000	78 5/8	26	4	12	3220
21	6460	76 5/8	26	8	10	3500	12500	94 5/8	26	4	12	3725
22	7750	66	30	10	10	4250	15000	89	30	5	14	4125
23	10300	83	30	10	12	4780	20000	113	30	6	16	4860
24	12900	78	36	12	12	6550	25000	96	36	6	18	6350
25	15500	89	36	12	14	7060	30000	112	36	6	20	7175

Companion flanges are furnished for connections 3 in. and larger. Supporting cradles will be furnished only when specified.

CONVERTORS FOR HOT WATER HEATING SYSTEMS

"Convertors"—instantaneous heaters used in heating water for a hot water heating system—are designed to heat water through a relatively small temperature range—to make up the temperature lost during the circulation process.

Gravity Circulation Systems—Flow depends on natural circulation induced by difference in temperature (i.e., specific weight) between water leaving convertor and water returning from system. Convertor is always of 2-pass type, proportioned to keep water velocity down to about 60 ft. per minute.

Forced Circulation Systems—Flow maintained by pumping. Convertor may be of 2-pass, 4-pass, or multi-pass type depending on actual conditions of job. Convertor used will be smaller in size than unit for gravity system of same duty, as heat transfer factor improves with increases in velocity. Forced system velocity may be as high as 300 ft. per minute or more.

The Type "R," or U-Tube, construction is most widely used for Convertor service though any of the other constructions may be used.

Proper Size Convertor for a Given Duty—Tables D and E show proper size of Type "R" Convertors for many typical temperature ranges and steam pressures. It is always advisable to give details of service when requesting quotation on convertors for operating conditions not shown in tables.

TABLE D. WHITLOCK GRAVITY CONVERTORS

Sq. ft. of total radiation	160°–190°—170 B.t.u. per sq. ft. of radiation per hr.	
	0 lbs. steam	5 lbs. steam
1000	8-S	6
1500	10	8
2000	11-S	9
2500	12	10-S
3000	13	11
3500	13	12
4000	14-S	12
5000	15	13-S
7500	17	15-S
10000	18	16-S
12500	19	17-S
15000	19 1/2-S	18-S
17500	20	18 1/2-S
20000	21	19-S
25000	22	20-S
30000	23	21-S
35000	23	22-S
40000	24	22-S
45000	25	23-S
50000	25	23-S
60000	.....	24-S
70000	.....	25-S

See note under Table E.

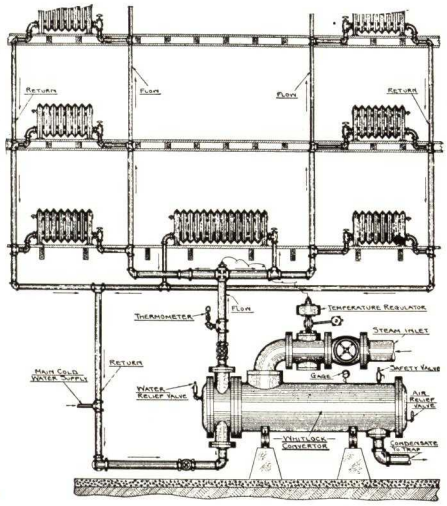


Fig. 4. Typical Piping Plan—Single Type "R" Convertor—Gravity Circulation

TABLE E. WHITLOCK FORCED CIRCULATION CONVERTORS

Gals. per min.	Steam at 0 lbs. gauge		Steam at 5 lbs. gauge		Steam at 10 lbs. gauge	
	160–190°	160–195°	170–200°	170–205°	170–200°	170–205°
10	5-M	6-M	5-M	6-M	4-4	5-M
20	8-4	9-M	8-4	9-M	6-4	8-4
30	10-4	11-M	9-4	10-4	8-4	9-4
40	11-4	13-M	11-4	12-M	9-4	10-4
50	12-4	13-M	12-4	13-4	10-4	11-4
75	14-M	15-M	13-4	15-M	12-4	13-4
100	15-4	16-4	15-4	16-4	13-2	15-4
125	16-4	17-4	.....	16-4	15-4	.....
150	17-4	18-4	16-4	17-4	15-4	16-4
175	.....	18 1/2-4	17-4	18-4	.....	.....
200	18-4	19-M	.....	18 1/2-4	16-4	17-4
250	19-4	20-4	18 1/2-4	19 1/2-M	17-2	.....
300	19 1/2-4	21-4	19-4	20-4	18-4	19-4
350	.....	22-4	20-4	21-4	18 1/2-2	19 1/2-4
400	21-4	.....	.....	.....	19-2	20-4
450	.....	.....	21-4	22-4	19 1/2-4	.....
500	22-4	23-4	.....	.....	20-4	21-4
550	.....	.....	22-4	23-4	.....	.....
600	.....	24-4	.....	.....	21-2	22-4
650	23-4	.....	.....	.....	.....	.....
700	.....	.....	23-4	24-4	.....	.....
750	.....	25-4	23-4	.....	22-4	23-4
800	24-4	.....	.....	.....	.....	.....
900	.....	.....	24-4	25-4	.....	.....
1000	.....	.....	.....	.....	23-2	24-4
1100	.....	.....	.....	.....	.....	.....
1200	.....	.....	.....	.....	24-4	25-4
1400	.....	.....	.....	.....	.....	.....

Figures refer to heater number—and number of passes. Ex. 13-4 means heater size No. 13 with 4 passes; 6-M means No. 6 heater with multi-pass section.

THE FILTRINE MANUFACTURING COMPANY

Specialists in Efficient Liquid Cooling and Filtration

53 Lexington Avenue, BROOKLYN, N. Y.

SERVING ARCHITECTS AND ENGINEERS FOR THIRTY YEARS

Products

FILTERS—PURIFIERS for water, alcohol and other light liquids, (hot or cold) : for ice-making, photo-developing, laboratories, apartment houses, residences, institutions, private water supply, industries, hotels, steamships, etc.

IRON REMOVAL FILTERS for residences and apartment buildings, hot or cold water lines.

WATER COOLERS and FILTERS, combined, cooled by ice.

WATER COOLERS and FILTERS, combined, for use with York, General Electric, Frigidaire, Westinghouse, Carrier, etc., refrigerating machines.

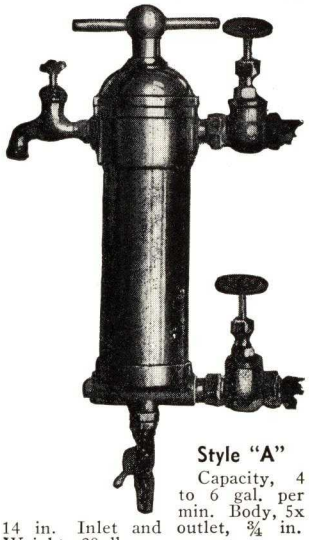
CIRCULATING DRINKING WATER SYSTEMS.

SHELL and TUBE EXCHANGERS and CONDENSERS.

TANKS and COILS—all metals.

General

Filtrine is the renewable filtering element used in all Filtrine Filters. Exceptionally high efficiency, clarity and purity. Filtrine retains all suspended matter and is easily, quickly replaced with new at low cost. Compactness of Filtrine Filters and light weight, permit installation in minimum space. *Used in many of the world's finest buildings.*



Style "A"

Capacity, 4 to 6 gal. per min. Body, 5x 14 in. Inlet and outlet, ¾ in. Weight, 20 lb.

"Filtrine" Style "A" Filter

This filter is designed to be set in the supply line with a number of outlets.

Especially suitable for: *Drinking water* in factories, hotels, office buildings, banks, theaters, etc. *Hot Water lines* in private homes, apartments, etc. *For general installation* in bottling plants, laboratories, restaurants, ice-making plants, etc. For greater capacity, filters can be mounted in multiples.

Made of heavily nickeled brass, valves and fittings of finest material. Tested for 75 lb. working pressure. All capacities are based on 25 lb. pressure per sq. in.

Operation — Water enters center standpipe from the bottom where the force is broken by specially designed "baffle." From the standpipe water works outward through encasing cylinder of "Filtrine," depositing all suspended matter on the surface of the filtering material, purified water flowing off at either of the outlet valves.

To clean, merely close inlet and outlet valves, open waste, remove top and lift out, and replace the "Filtrine." The entire replacement takes less than one minute.

Style "B"

Capacity, 15 to 20 gal. per min. Weight, 100 lb. Floor space required 18x18 in. x 24 in. high. Inlet and outlet, 1½ in.

"Filtrine" Style "B" Filter

Suitable for general circulating water systems in hotels, theaters, restaurants, apartment houses, department stores, and for filtering water for swimming pools, ice plants, factory and industrial use. Installed at any point in water service line.

Made of galvanized iron. Can be installed in batteries of two or more units with capacities up to 100 gal. per minute.

Style "B" Filters in Multiple—Where large capacity is required, two or more units may be mounted in multiple. Each filter has individual inlet and outlet control valves, permitting independent operation. Light weight and minimum space required. May be installed in penthouse or any out-of-the-way place. No special foundations necessary. Suitable for ice plants, hospitals, hotels, swimming pools, industries, residences, etc.

Style "B" Filters in Multiple

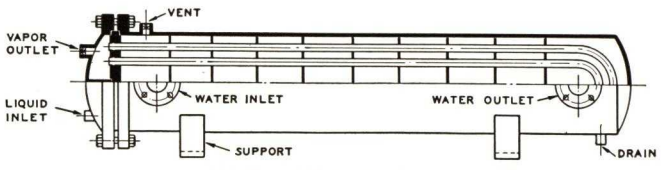
Style No. 4

Style No. 4 Filter

Solid, heavy, all-brass construction. Designed for installation in water supply line (hot or cold). Over-all dimensions, 8x5 in. Water inlet ½ in. Water outlet ⅜ in. Capacity 2 g.p.m. under 25 lbs. pressure. Should be installed in accessible location in water line to kitchen sinks, drinking fountains, water coolers, mixing tanks, etc. Two or more filters may be mounted on headers to increase capacity.

Architect's Specifications for Filtrine Filters

Plumbing contractor shall furnish and install, as shown on plans, in circulating drinking water system (two) filters, each filter having a published capacity rating of (4) g.p.m. under 25 lbs. operating pressure. Filters shall be of all-brass construction suitable for 75 lbs. working pressure. Filters shall be mounted on (1 in.) brass inlet and outlet headers with individual control valves for each filter. Filters shall employ renewable filtering element and be guaranteed to remove all suspended matter from the water. Filters shall be in detail accordance with Style ("A") as manufactured by FILTRINE MANUFACTURING COMPANY, Brooklyn, N. Y.

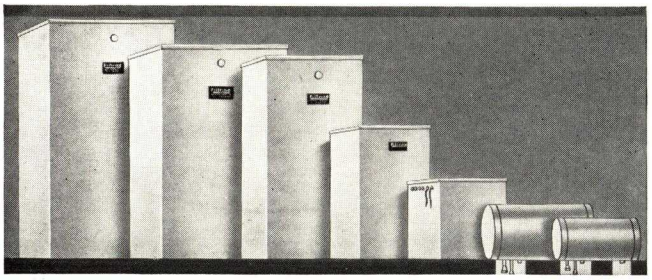


Shell and Tube Cooler

Shell and Tube Cooler for Air Conditioning and Industrial Application

Steel shell with bolted flanged steel head, supported in horizontal position by loose cradle supports. Evaporator consists of steel or copper tubes in U-bend formation. Tube bundle removable. Tube ends securely rolled to full depth of grooved tube sheet. Closely spaced circular orifice type steel baffles, prevent channeling of water. Refrigerant connections at one end, separated by one or more partitions in the head dividing the cooler into from one to four "circuits" depending on the number of cndensing units to be used. Drywells for thermostat bulbs. Flanged water connections. Refrigerant in tubes.

Remote Models



M-150-R M-75-R M-40-R M-25-R M-14-R X-5-R X-2-R

Model	Storage, gals.	Evap. surface, sq. ft.	Overall dimensions, in.	Water, in. In	Water, in. Out
X-2-R	2	1.75	10x21¼	⅜	⅜
X-5-R	5	3.3	14x25½	⅜	⅜
M-14-R	14	9.0	18½x18½x25½	½	½
M-25-R	25	16.5	21 x21 x33½	½	½
MA-40-R	40	16.5	23 x23 x52½	¾	¾
M-40-R	40	44.0	23 x23 x52½	¾	¾
M-75-R	75	50.0	30 x30 x48	1	1
M-150-R	150	103.5	35 x35 x68	1	1

Cafeteria Type Water Coolers

Designed for restaurants and cafeterias. Filtrine insulated storage cooler in upper section provides large storage of chilled water to meet "peak" demands. Lower suitable for housing refrigerating unit (by others). (Numerals in model numbers indicate storage in gallons). Furniture steel construction on angle iron frame. White Duco finish or to suit. Polished monel top, large round-cornered drip tray. Two or more chromium push-back glass fillers. With or without side brackets for glasses.

MC-14-S and MC-25-S
Standards Approved by NEMA

Drinking Water Requirements

Type of service	Delivered water temp. F.	Gal. per person per hour	Waste and consumption per person per hour, oz.	Consumption only per person per hour, oz.	People served per gal.
Office (cup)	45–50	.033	4.2	4.2	30
Office (bubbler)	45–50	.083	10.5	4.2	12
Light mfg.	45–50	.143	18.3	7.32	7
Heavy mfg.	50–55	.20	25.6	10.24	5
Hot heavy mfg.	55–60	.25	32.0	12.8	4
Restaurant	40–45	.1 gal. per person			
Cafeteria	40–45	.083 gal. per person			
Theater	45–50	1.0 gal. per 100 seats continuous capacity.			
Schools	45–50	.083 plus 5 gal. storage per fountain.			
Hospitals					
A. per bed	45–50	.083 gal.			
B. per attendant	45–50	.083 gal.			
Hotels	45–50	.08 gal. per hour per room.			
Department stores, hotel and office building lobbies	45–50	4 to 5 gal. per hour per fountain.			

Circulating Systems

The use of storage type water coolers in circulating drinking water systems have proven, after years of use, the most dependable and best method of chilling water for:

Hotels	Restaurants	Hospitals
Theatres	Public buildings	Institutions
Libraries		Office buildings

Filtrine storage type Models MA-40-R, M-40-R, M-75-R and M-150-R, (numerals indicate storage in gallons) and other sizes made to meet larger requirements are particularly designed for this application.

General—A complete circulating system generally consists of one of the above model coolers; one or more condensing units; one or more circulating pumps; one or more Filtrine Filters (Style A). A return loop of pipe thoroughly insulated (ice water cork thickness) carries the chilled water to the remote fountains and back to the cooler.

Filters—The use of filters in a circulating drinking water system is just as important as chilling the water. Filters act as a safety valve to keep all impurities from settling in the system. Filtrine Filters render pure sparkling "Conditioned-Water."

Industrial Type Water Coolers

Designed for "heavy" requirements in steel mills, railroad shops, foundries, cotton mills, etc. Heavy steel plate construction. Filtrine insulated storage cooler in upper section. Lower suitable for housing refrigerating unit (by others). (Numerals in model numbers indicate storage in gallons). Additional fountains and faucets optional.

MI-14-SB and MI-25-SB

Capacity Data—Filtrine Water Coolers

Filtrine Model No.	Suction temp. °F.	Water temp. out	Water cooling capacities—gals. Per hour water temp. in 70°	80°	90°	2-hour peak water temp. in 70°	80°	90°
X-2-R	25	50	4.7	3.6	3	10.4	8.2	7
X-5-R	25	50	8.9	6.8	5.8	18.8	14.6	12.6
M-14-R MC-14-S MI-14-SB	26	45	25.5	16.8	12.8	38	40.6	32.6
		50	31.8	21.6	16	70.6	50.2	39
M-25-R MC-25-S MI-25-SB	26	45	41	32	27	89	71	61
		50	59	45	34.4	125	97	75.8
MA-40-R	26	50	59	45	34.4	138	110	88.8
M-40-R	26	45	106	78	65	224	172	150
		50	145	105	80	310	230	180
M-75-R	26	45	141	88	70	285	209	177
		50	173	115	87	383	267	211
M-150-R	26	45	252	180	148	589	421	359
		50	326	232	178	727	539	431

B.t.u. Refrigeration Load per Gallon of Water

Inlet water temp.	Outlet water temp.	B.t.u. per gallon	Inlet water temp.	Outlet water temp.	B.t.u. per gallon	Inlet water temp.	Outlet water temp.	B.t.u. per gallon
70°	45°	208	80°	45°	291	90°	45°	374
	50°	166		50°	250		50°	333

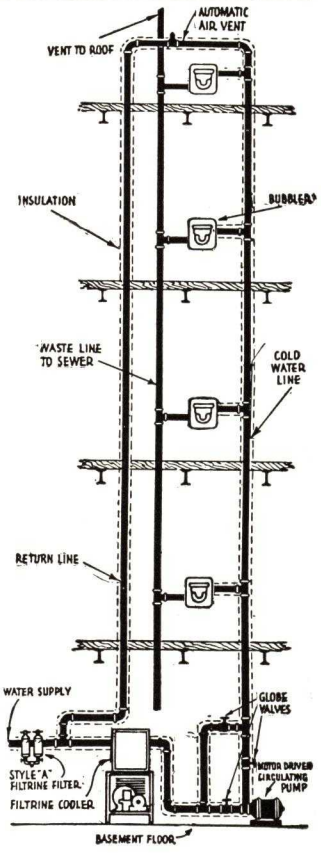
Typical Specifications for Architects and Engineers

Contractor shall furnish and install complete circulating drinking water system as shown on drawing comprising:

Insulated Storage Water Cooling Tank, Water Filters, Circulating Pump, Automatic Refrigerating Machine, all with necessary valves, electrical controls, insulated water supply and return lines and fountains.

Insulated Storage Water Cooling Tank—To have a storage of not less than (....) gallons made of extra heavy riveted and welded steel construction, containing not less than (....) lineal feet of specially processed steel pipe evaporator coil. Inside and outside of tank and outside of coil to be hot dipped galvanized after fabrication. Tank to be housed in galvanized steel container and insulated with not less than 3-in. cork insulation. All as per model (....) as manufactured by The Filtrine Manufacturing Company, Brooklyn, N. Y.

Water Filters—Furnish and install, as shown on plans, two Style (...) Filters, all-brass construction, having a published capacity rating of (...). Filters to be mounted on (...) inlet and outlet headers, with individual control valves for each Filter. Filters shall employ renewable filtering element and be guaranteed to remove all suspended matter from the water and to be in accordance with Style (...) as manufactured by The Filtrine Manufacturing Company, Brooklyn, N. Y.



THE H.L.G. COMPANY

Manufacturers of a Complete Line of High Quality Domestic Zeolite Water Softening Equipment—Warranted Good

TELEPHONE
8415

KALAMAZOO, MICH.

VELVET AND KALAMAZOO WATER SOFTENERS

Selecting the Correct Size

Both simple and important for any job. Three points must be considered: hardness of water, amount of water used, how often to regenerate.

Hardness of water—rated in "grains per gallon"—can usually be secured from your local water department or company. If not, and in doubt, send us at least a 1-qt. sample for free analysis. Mark it city water, or private well, with name and address.

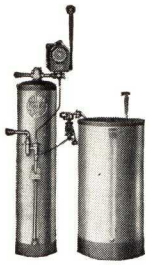
Amount of soft water used varies with the number of people in a family and with the installation. If connected for—

Supplying soft water at all hot and cold fixtures, toilets and sprinklers, estimate 400 gals. per person weekly.

Supplying all hot and cold water fixtures but not toilets and sprinklers, estimate 200 gals. per person weekly.

Supplying soft water to hot water fixtures and cold only to laundry, estimate 125 gals. per person weekly.

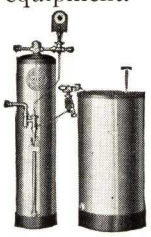
Special: For toilets and for sprinkling, use hard water; soft water is not required. These uses are heavy.



Velvet Full Electric Automatic Water Softener, Type D

Fully automatic, requiring only addition of salt to brine tank a few times yearly. Type D is equipped with omitting device electric time control and with automatic brine control valve. Both are easily adjustable, so that, if proper sized equipment is selected, most exacting requirements can be met.

Velvet Full Electric Automatic Water Softeners, Type D, are fully proven and represent today's outstanding user value in domestic water softening equipment.



Velvet Water Softener, Type C

Mechanical time-controlled semi-automatic softener and is equipped with a selective type of regeneration control. It is only necessary to set the mechanical timer and turn a button. Regeneration from that point is completely automatic.

Velvet Water Softener, Type C, is easily converted to Velvet Full Automatic, Type D, simply by addition of the electric controls.

Velvet Water Softener, Type B

Conventional semi-automatic softener with brine tank.

The simplicity of the regeneration is due to the use of but one valve which, when regeneration is started manually, continues until manually stopped.

Velvet Water Softener, Type B, has the same basic design as Types D and C and can be easily converted into either of these models.

Kalamazoo Water Softener, Type KB

Conventional semi-automatic softener with brine tank. The simplicity of the regeneration is due to the use of but one valve which, when regeneration is started manually, continues until manually stopped.

Kalamazoo Water Softener, Type KB, is of highest quality but priced comparatively low for wide sale. This has been accomplished through exclusive design without sacrifice of high basic quality.

Kalamazoo Water Softener, Type KA

Hand regenerated, direct salting, and represents the latest developments in this type of equipment.

Type KA is fitted with mineral retaining screen to prevent loss of mineral and permitting an unusually high flow rate for a given size of tank diameter. The mineral retaining screen being attached to the filling plug is easily removed for cleaning.

VELVET WATER SOFTENERS

Model	Total capacity, grains	Flow rate, g. p. m.	Soft. tank, in.	D-C Brine tank, in.	B Brine tank, in.	Height over-all, in.	Floor space, in.	Pipe, in.
D-C-B-8	15,000	8	10x36	16x36	14x28	42	18x30	¾
D-C-B-10	20,000	10	10x48	20x36	16x36	54	22x34	¾
D-C-B-14	30,000	14	12x48	20x36	16x36	56	22x38	¾
D-C-B-18	40,000	18	14x48	24x36	20x36	58	26x42	¾-1¼
D-C-B-24	50,000	24	16x48	30x36	20x36	60	32x50	1¼
D-C-B-30	60,000	30	18x48	36x36	24x36	62	38x60	1¼
D-C-B-36	80,000	36	20x48	36x36	30x36	66	38x62	1¼

In general Velvet Water Softener models are suitable for installation as follows: No. 8—1 and 2 bathrooms; No. 10—2 and 3 bathrooms; No. 14—3 and 4 bathrooms; No. 18—5 bathrooms; No. 24—12 outlets; No. 30—16 outlets; No. 36—20 outlets.

KALAMAZOO WATER SOFTENERS

Model	Total capacity, grains	Flow rate, g. p. m.	Soft. tank, in.	KB Brine tank, in.	Height over-all, in.	KB Floor space, in.	KA Floor space, in.	Pipe size, in.
KB-KA-1	12,000	8	10x36	14x28	42	16x28	12x14	¾
KB-KA-2	18,000	10	10x48	16x36	54	16x28	12x12	¾
KB-KA-3	24,000	12	12x48	16x36	56	16x32	14x16	¾
KB-KA-4	30,000	14	12x48	16x36	56	20x36	14x16	¾
KB-KA-5	36,000	16	14x48	20x36	58	22x36	16x18	¾
KB-KA-6	48,000	22	16x48	24x36	60	26x42	18x20	1¼
KB-KA-7	60,000	30	18x48	24x36	62	26x44	20x22	1¼

In general both KA and KB models are suitable for installation as follows: No. 1—1 and 2 bathrooms; No. 2—2 and 3 bathrooms; No. 3—3 and 4 bathrooms; No. 4—12 outlets; No. 5—14 outlets; No. 6—16 outlets; No. 7—20 outlets.

Note: To obtain total capacity in gallons divide the total capacity in grains, as shown by second column, by the grains hardness of water to be used.

Velvet Water Softeners, Type E

Manufactured in larger sizes for industrial, commercial and institutional requirements. In nine sizes, from 100,000 grains to 1,000,000 grains capacity.

Due to the fact that most jobs of this nature are special, it is necessary for our Engineering Department to furnish complete details and specifications based upon requirement data. Please write.

Quality

Velvet and Kalamazoo Water Softeners are of highest quality, fully guaranteed as to material, workmanship and performance Highest grade, high capacity, white synthetic zeolite used.

All are beautifully finished in two-tone green and two-tone gray, salt and rust-resisting enamel, to meet modern-day appearance requirements.

Note: Velvet and Kalamazoo Water Softeners are sold only by the plumbing trade and through recognized plumbing trade channels.

Further Information

Please write for up-to-date price lists, detailed specifications, engineering data and descriptive folders.

Technical information, water analysis, etc., gladly and promptly supplied upon request.

THE NORWOOD ENGINEERING COMPANY

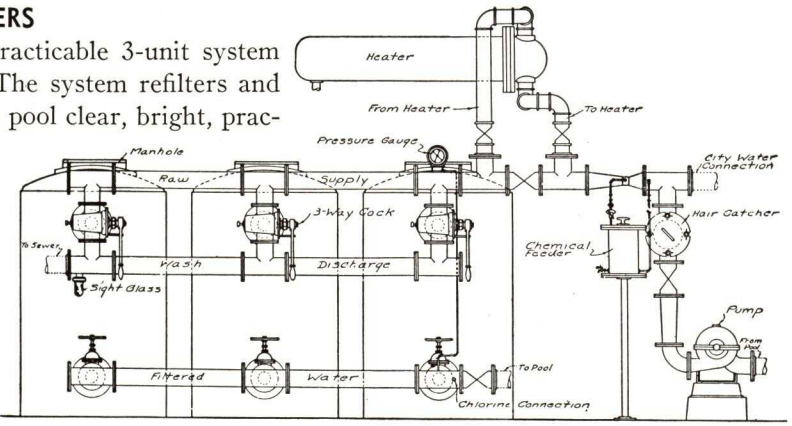
Residence Water Filters and Ozonizers; Swimming Pool, Industrial and Municipal Filters

30 North Maple Street, FLORENCE, MASS.

DEPENDABLE WATER PURIFICATION SYSTEMS SINCE 1896

SWIMMING POOL FILTERS

Norwood has pioneered in the extremely practicable 3-unit system of filtration for swimming pool purification. The system refilters and recirculates the water, keeping the water in the pool clear, bright, practically colorless, and free from bacteria of a harmful nature. By recirculation of the water great savings in heating are effected and the pool can safely be used for months without emptying. Each installation is properly equipped with chemical feeders and hair catchers; operation is extremely easy, being controlled by a simple three-way valve; washing of units is simple and economical.



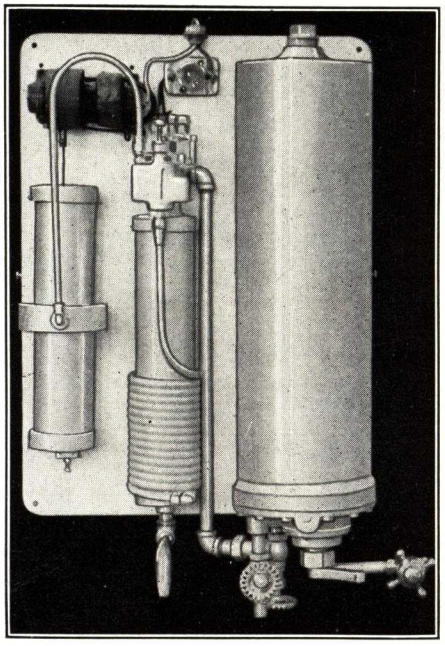
View of a typical installation of Norwood 3-unit Swimming Pool Filters showing circulating pump, hair catcher and chemical feeder

FILTERING AREA AND CAPACITY

Size of units	Sq. feet of area	Gallons per hour
3-18″	5.28	1250-1550
3-21″	7.20	1700-2100
3-24″	9.42	2300-2900
3-30″	14.70	3500-4450
3-36″	21.18	5100-6300
3-42″	28.86	6900-8600
3-48″	37.68	9000-11000
3-54″	47.40	11400-14220
3-60″	58.89	14000-17500
3-72″	84.81	20000-25000
3-84″	115.44	27000-34000
3-96″	150.78	36000-45000
3-120″	235.62	56000-71000

Norwood Filters are installed in prominent colleges, institutions and private clubs, including Harvard, Dartmouth, Yale, Amherst, Smith, Wellesley, Manursing Island Club, Nassau Country Club and many others.

Complete Catalog on Request



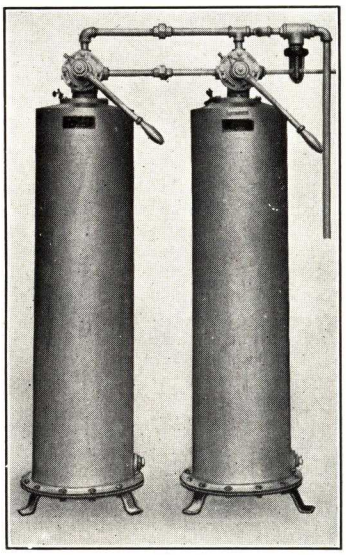
Residence Type No. 10 Hartman Water Ozonizer (with cover removed). Capacity 60 to 70 gals. per hour

HARTMAN WATER OZONIZERS

For sterilizing drinking water in residences, offices, theaters, restaurants and other places requiring individual units for supplying small quantities of pure drinking water. Unit produces ozone (tri-atomic oxygen), which acts as extremely efficient purifying agent. Will destroy B. Coli, other bacteria, and micro-organisms. Will eliminate objectionable odors, tastes and color arising from vegetable and other organic matter, as well as odor and taste of chlorine, hypochlorites, and phenols, as well as sulphuretted hydrogen. Will produce better water than required by laws of health departments.

Made in sizes for capacities of 60 gals. per hour and up. Operates at 2¢ per thousand gallons, or less, depending on capacity. Entirely automatic in operation.

Detailed Bulletins on Request



Combination Sand and Carbon Filters for Residences

RESIDENCE TYPE PRESSURE FILTERS

These pressure filters purify the water by filtration through sand or quartz. They are made in single, double or triple units, and in a combination of sand filter and carbon filter units, in sizes from 12 to 24 in. in diameter. The sand filter will remove all matter in suspension, and the carbon filter will remove color and odor.

Where the water is highly polluted and carries objectionable matter in solution, a coagulant feeder can be added, or a proportionate chlorine solution feeder.

Capacities vary from 150 g.p.h. on the 12-in. size to 575 g.p.h. on the 24-in. size. They are simple to operate, the filtering, washing and rinsing being controlled by a single operating valve.

For further details ask for Small Pressure Filter Catalog.

THE PERMUTIT COMPANY

World's Largest Exclusive Makers of Water Conditioning Equipment
All Types—All Sizes—For All Purposes

TELEPHONE
BRyant 9-9050

330 West 42nd Street, NEW YORK, N. Y.

CABLE ADDRESS
"Permutit, New York"

SALES OFFICES

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FLORIDA: Bradenton—P. O. Box 1201.
ILLINOIS: Chicago—210 So. Clark St.
MASSACHUSETTS: Boston—800 Statler Bldg.
MICHIGAN: Detroit—502 Free Press Bldg.
MINNESOTA: Minneapolis—307 Essex Bldg.
MISSOURI: Kansas City—215 Pershing Rd.
St. Louis—4064 Olive St.
NEW YORK: Buffalo—132 Park St.
NORTH CAROLINA: Charlotte—500 Queens Rd.
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Pittsburgh—615 Dollar Savings & Trust Bldg.
TENNESSEE: Chattanooga—415 Provident Bldg.
TEXAS: Fort Worth—347 Majestic Bldg.

PERMUTIT COMPANY OF CANADA, LTD.
1440 St. Catherine Street, W., Montreal, Que.

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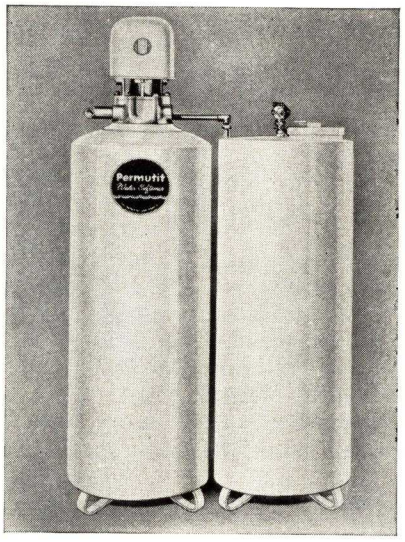
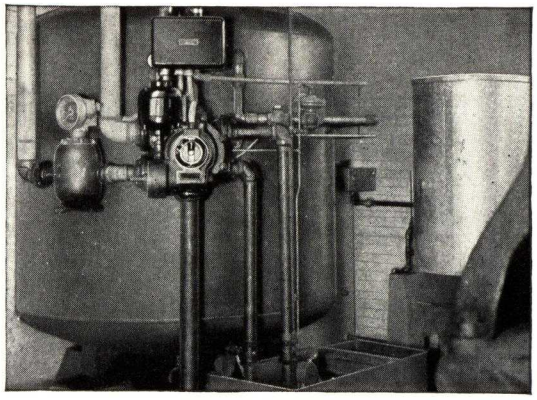
MONTREAL, QUE., C. Kirkland McLeod, Ltd., 1440 St. Catherine Street, W.
TORONTO, ONT., J. A. McGarigle, 137 Wellington St., W.
WINNIPEG, MAN., Stanley Brock, Ltd., 145 Market Avenue, E.



PERMUTIT PRODUCTS

WATER SOFTENERS, FILTERS and other WATER CONDITIONING EQUIPMENT, including:

Fully automatic or manually operated Downflow and Upflow Zeolite Water Softeners equipped with porous and non-porous zeolites; Hot Process and Cold Process Intermittent and Continuous Lime Soda Softeners; Internal Boiler Feedwater Treatment; Pressure and Gravity Filters; Taste, Color and Odor-removing Equipment; Activated Carbon Filters; Coagulant and Corrective Chemical Feeds; Iron and Manganese Removal Equipment; Continuous Blowoff Equipment; Carbon-dioxide Recorders, etc.



HOUSEHOLD AUTOMATIC WATER SOFTENERS

These zeolite water softeners are of the finest quality throughout, and are built to give long years of trouble-free service. Automatic in operation, they can be furnished with any of three types of control: (1) A switch located on the softener or at a remote point, when thrown by hand, initiates regeneration, which is then automatically carried through, and the softener automatically returned to service. (Model AS.) (2) An electric clock may be set for any hour of the day, and any day or days of the week, regenerating the softener under fully automatic control. (Model AST.) (3) A specially designed meter causes the softener to regenerate when a specified number of gallons of water has passed through it. (Model ASM.)

In addition to these automatic household softeners, there is a wide range of models and sizes of hand-operated equipment, using both natural and synthetic zeolites.

Household water softeners are now available in sizes to fit any income, any requirement. A small portable unit can be used to soften the water from one faucet—there are intermediate models for use in kitchens and bathrooms of apartment houses, etc.—and full-sized equipment can be fitted to any home. As the choice of model and size is usually determined by the size of home and hardness of water, it is desirable to consult THE PERMUTIT COMPANY as to details and prices. Free water analysis service.

Other Household Products

THE PERMUTIT COMPANY likewise offers a full line of supplementary household water conditioning equipment: Filters to remove dirt and turbidity, activated carbon filters to remove taste and odor, anti-corrosion devices to prevent red water troubles. Full details on request.

Write for Bulletin

Send for a copy of "Household Water Treatment" which contains full specifications and data. Free on request.

INDUSTRIAL AUTOMATIC WATER SOFTENERS

These zeolite water softeners are the latest development in the field of industrial water treatment. Fully automatic operation assures freedom from the errors of human control, and produces a supply of uniformly softened water at a lower cost per thousand gallons.

Besides the automatic softener, which is an exclusive Permutit development, industrial water softeners with single-valve control, or multi-valve control, manually operated, are available.

There are 160,000 zeolite water softeners of all types now in use. THE PERMUTIT COMPANY originated zeolite water softening, and this equipment is broadly used in buildings, clubs, hospitals, hotels, power plants, mills, factories, laundries, food plants, municipalities, etc., in capacities from a hundred to millions of gallons per day.

Other Industrial Equipment

In addition to zeolite water softeners, as the list above shows, Permutit offers filter equipment for the removal of dirt, turbidity, iron, and oil, and special equipment for the removal of color, taste, odor, etc., from water.

A water supply, through a combination of Permutit equipment, can be practically built to individual specifications of physical and chemical analysis. Impurities can be removed; desired ingredients can be added.

THE PERMUTIT COMPANY maintains large laboratories and a highly trained technical staff for the solution of your water problems. Write us whatever questions you have in mind.

Write for Booklets

Authoritative booklets can be had for the asking, covering any phase of water conditioning. Send us the details of your problems—no charge or obligation.

PURO FILTER CORPORATION OF AMERICA

Drinking Water Specialists for Nearly 40 Years

TELEPHONE
SPring 7-1800

440 Lafayette Street, NEW YORK, N. Y.

BRANCHES

ALBANY
BOSTON
CHICAGO
CLEVELAND
DETROIT
LOS ANGELES
MIAMI
NEWARK
YOUNGSTOWN
PHILADELPHIA
PITTSBURGH
ST. LOUIS
SAN FRANCISCO

PURO ELECTRIC WATER COOLERS AND FILTER-PURIFIERS

For Use in Offices, Hospitals, All Types of Commercial Buildings and Homes

PURO ELECTRIC WATER COOLERS

Cabinets

Heavy gauge steel reinforced. Attractively finished in mahogany baked enamel.

PURO WATER ELECTRIC COOLERS

Cooler Models

Faucet type, side bubblers, top bubblers and refrigerator cooler of various sizes and capacities.

Insulation

Covered with 1½ in. x 2 in. of insulation surrounding cooling apparatus, and corners packed tightly with mineral wool.

Cooling Unit

Special Puro design, providing rapid cooling with clean, uncontaminated storage of water.

Lowside

Direct expansion type with thermostatic control built according to Puro specifications.

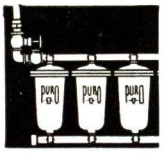
Condensing Unit

Conventional reciprocating type, quiet and efficient.

All parts accessible for service.

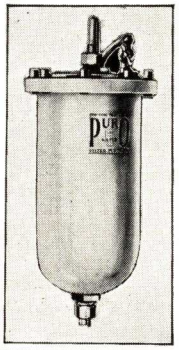
China Parts

For bubbler tops, trays and compartments.

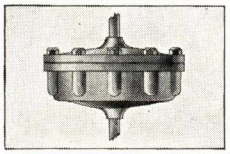


PURO FILTERS

The Puro Filter-Purifiers have been scientifically designed and constructed, and have proved their ability to remove from water all foreign matter causing color, taste and odor.



Filter-Purifier No. 1—Placed inside the Puro Electric Water Coolers, providing consumer with self-contained unit for cold and purified water.

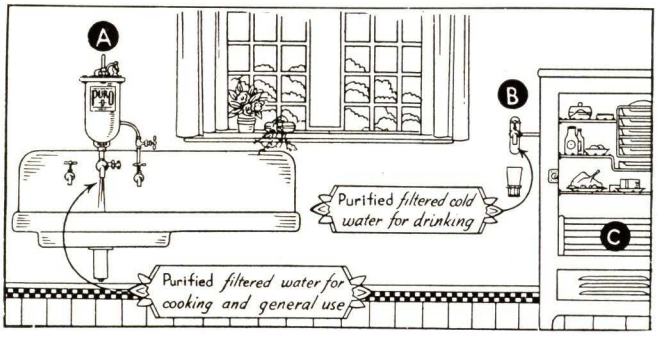


Filter No. 2—This filter eliminates all suspended matter and is especially desirable in fine photographic work.

Filter-Purifier No. 3—Larger capacity and can readily be installed in hotels, restaurants, factories, etc., where purification of greater quantity of water is desired.

All these filters can be joined in series or parallel as shown pictorially at the bottom center of this page.

Household Filter-Purifier Installation



For household use No. 1 Filter-Purifier is used installed above kitchen sink, but can be installed at any other location desired. Directly connected with city water supply, and with cooling coils in iceboxes and refrigerators, enabling the consumer to draw cold, purified drinking water from a separate faucet.

ROBERTS FILTER MANUFACTURING CO.

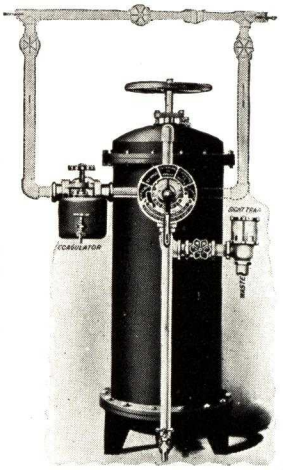
606 Columbia Avenue
DARBY, PA.

For Roberts Swimming Pool Recirculation Systems, see File Index

TECHNICAL DATA ON ROBERTS FILTERS

Types

Pressure and Gravity Filters for all requirements and capacities. Filters for residences; apartment houses; hotels; hospitals; institutions; factories; swimming pools; and public or private water supply systems, whether small or large. Stock filters are designed for 60 lbs. working pressure, but all styles are available for higher pressures when specified.



Style "D" Filter

Style D Filter

Sizes: 12, 16 and 20 ins. The ideal household filter. Cylinder is of heavy cast iron. All operations controlled through a single, all-bronze, operating valve. Style DH Filter built to same specifications but arranged for gate valve control. Write for Bulletin 20.

Style E Filter

Sizes: 12, 16, 20, 24, 30, 36, 42 and 50 ins. Cylinder is of heavy cast iron. Filter equipped with single operating valve. Style M and Style O filters consist of two Style E filters in series, the second cylinder being charged with bone charcoal or activated carbon for taste and odor absorption. Write for Bulletin 40.

Style H and Style G Filters

Sizes: 30, 36, 42, 48, 54 and 60 ins. Cylinder constructed of steel, with welded seams. Operations of Style H filter controlled through gate valves. Style G filters available in same sizes and constructed to same specifications, except that a single operating valve is substituted for gate valves. Write for Bulletin 60.

Style L Filter

Sizes: 66, 72, 78, 84 and 96 ins. Cylinder is of steel. Piping arranged with gate valve control. Valves and fittings can be of screwed or flanged pattern, as preferred. Write for Bulletin 80.

General

All Roberts Filters include an automatic coagulator for feeding minute quantities of alum when filtering turbid water. Filter beds in all units consist of properly graded silica sand superimposed on a bed of graded filter gravel. Cleaning of all filters is thoroughly and easily accomplished by reversing the flow of water, which lifts and liquefies the silica sand, scouring it on itself, and flushing the collected impurities and suspended matter to the drain with the waste wash water.

VERTICAL PRESSURE FILTERS, DIMENSIONS, CAPACITIES, ETC.

Size (inside diam.), in.	Filtering area, sq. ft.	Capacity, gal. per hr.			Height overall, in.	Pipe connections, in.		Floor space, ft.
		2-gal. rate	3-gal. rate	4-gal. rate		Inlet and outlet	Waste to sewer	
12	.78	95	140	190	58	1	1¼	2¼x2¼
16	1.39	170	250	340	63	1	1¼	2½x2¼
20	2.19	265	395	530	64	1	1¼	3 x2½
24	3.14	380	565	760	64	1¼	1½	3½x2¾
30	4.91	595	885	1190	74	1½	2	5¼x4
36	7.07	850	1275	1700	75	2	2½	5¾x4
42	9.62	1155	1735	2310	76	2	2½	6¼x4
48	12.56	1510	2265	3020	78	2½	3	6¾x4½
54	15.90	1910	2865	3820	78	2½	3	7¼x5
60	19.63	2360	3535	4720	79	2½	3	7¾x5¼
66	23.76	2850	4280	5700	87	3	4	8½x6
72	28.27	3395	5090	6790	90	3	4	9 x6½
78	33.17	3980	5970	7960	91	3	4	9½x7
84	38.48	4620	6930	9240	95	4	5	10½x7½
96	50.26	6035	9050	12070	98	4	5	11 x8½

Notes on Specifications

Always specify Filters by size (inside diameter) and style. Capacity is meaningless unless the rate of filtration in gallons per square foot per minute is fixed by the specifications. Refer to tabulation on this page and use the minimum, or 2-gal. per sq. ft. per minute rate for all domestic services and for filtering all water of more than average turbidity regardless of use of filtered water. Use the intermediate, or 3-gal. rate when filtering water of limited turbidity for purposes other than domestic. The 3-gal. rate is also recommended for swimming pool recirculation; but the maximum, or 4-gal. rate can be used for this service with safety when the bathing load will not be heavy. See File Index for our pages on Swimming Pool Recirculation.

Co-operative Service

Our Technical Department welcomes water treatment problems from architects and engineers, and in all cases will be glad to make specific recommendations regarding size and type of equipment for a given need.

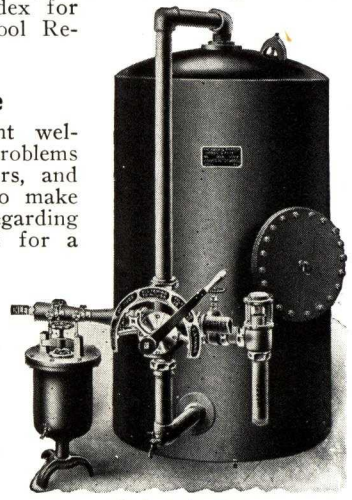
Other Products

Horizontal Pressure Filters. Sizes: 8 ft. diameter, 10 ft. long to 8 ft. diameter, 25 ft. long. See our Bulletin 100.

Zeolite Water Softeners.

Concrete and Wood Gravity Filters.

Units for every problem of Water Treatment.


Style "G" Filter

FOUNDED 1802

WM. B. SCAIFE & SONS CO.

Water Filters and Water Softeners for All Industrial and Domestic Uses

EXECUTIVE OFFICES, LABORATORY AND WORKS
Ann Street and Allegheny River
OAKMONT, PA.

PRODUCTS

For Industries or Institutions:

WATER FILTERS: Pressure, Gravity, Taste and Odor Removal, Iron Removal, Oil Removal.

WATER SOFTENERS: Lime-Soda, Hot Process, Semi-Hot Process, Cold Process, Greensand Zeolite, Synthetic Zeolite.

CHEMICAL FEEDING EQUIPMENT.

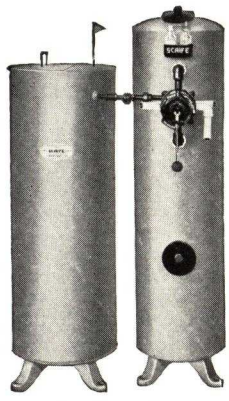
SWIMMING POOL FILTERS and ACCESSORIES.

TANKS: Brazed, Welded and Riveted.

For Households, Apartments and Buildings:

WATER SOFTENERS, WATER FILTERS, TASTE and ODOR REMOVAL FILTERS, IRON REMOVAL FILTERS.

EQUIPMENT for Prevention of Red Water and Pipe Corrosion.



Household Water Softener

Household Water Softeners and Filters (Bulletins 233, 259 and 227)

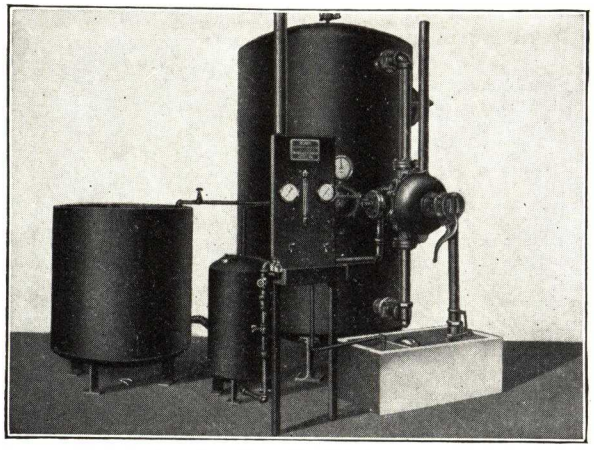
Complete lines of softeners and filters are manufactured for the removal of hardness, turbidity, iron, taste and odor from water, suitable for homes, country estates, apartment buildings, hotels, etc.

Zeolite Water Softeners (Bulletin 242)

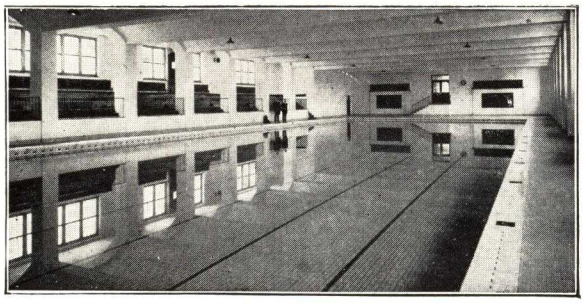
The Zeolite Water Softener adapts itself admirably for softening water used in boilers, laundries, hospitals, industrial plants and residences. A Scaife Zeolite Water Softener will pay for itself in a remarkably short time.

Swimming Pool Filtration (Bulletin 220)

Scaife Pressure Filters when applied to indoor and outdoor swimming pool filtration deliver water of crystal clearness. The

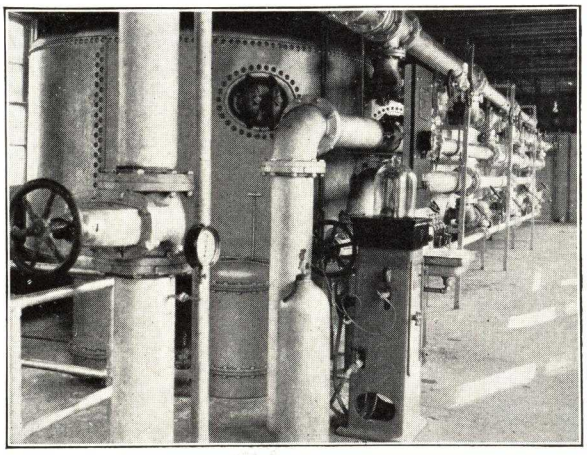


Scaife Zeolite Water Softener



Pool Equipped with Scaife Recirculating Filters

Scaife recirculating system provides equal distribution of clean, clear and sterile water. The proper relationship between the various pieces of equipment in the recirculating chain is of utmost importance. The benefits of our years of experience are at your disposal.



Scaife Pressure Filters

Pressure Filters (Bulletin 275)

Pressure filters produce clear water at minimum cost. Water introduced into the apparatus under pressure can be clarified and delivered to any part of the building.

The pressure filter is built in all sizes, of capacities from 1 gal. per minute to 700 gal. per minute each. Larger capacities may be obtained by using multiple units.

Iron Removal Filters (Bulletin 500)

For the removal of iron from water, these filters are charged with *Birm,* a special iron removal mineral which acts as a catalyzer to combine the oxygen with the iron in the water, forming the insoluble iron hydroxide which is retained in the filter. No chemicals are required. The iron is removed from the *Birm* by merely backwashing the filter. Particularly adaptable for industrial plants, municipalities and institutions.

Quality, Experience and Service

WM. B. SCAIFE & SONS CO., one of the oldest and best equipped quality manufacturers of water purifying equipment, offers its knowledge and experience to the architect and engineer. Its staff is composed of experienced, expert engineers and chemists who devote their whole activities to Water Softening, Filtration and Purification problems. Recommendations for the correction of your water problems will be gladly suggested. Scaife Service is at your disposal.

If we do not have a representative in your city, write us at Ann Street and Allegheny River, Oakmont, Pa.

THE AMERICAN BRASS COMPANY

GENERAL OFFICES
WATERBURY, CONNECTICUT

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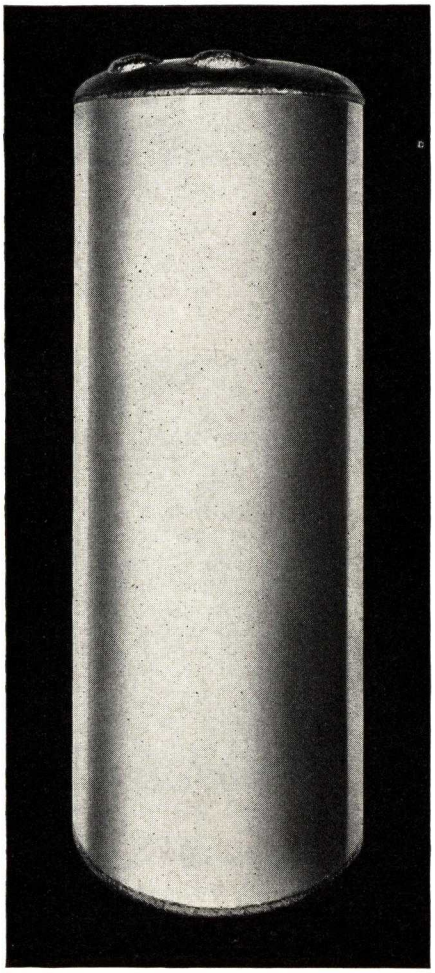
IN CANADA: Anaconda American Brass Limited, NEW TORONTO, ONT.

For Other Pages, see File Index

EVERDUR METAL FOR NON-RUST TANKS



ANACONDA
from mine to consumer
REG. U.S. PAT. OFF.

Everdur Silicon Bronze for non-rust tanks is a high strength, corrosion-resistant alloy composed of copper, silicon, and other controlled elements. It was developed for structural and engineering uses which require a metal with the tensile strength of mild steel, combined with immunity to rust, and corrosion-resistance equal to or better than copper.

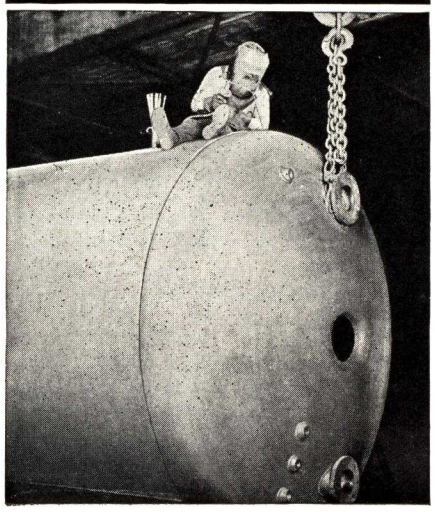
Everdur, costing less than most special corrosion-resisting metals, is relatively inexpensive. Fabricating costs for welded Everdur tanks are closely comparable with those for welded steel and considerably less than those constructed by riveting and brazing.

Everdur tanks in service today range in size from 1-gal. containers for gasoline stoves to 20,000-gal. pressure vessels operating as units in chemical process work. Everdur tanks have been constructed by practically all the standard methods, including resistance seam welding, carbon arc, metallic arc and oxy-acetylene welding. Riveted construction has been employed for vessels of unusual design. Today, Everdur storage water heaters and service water heaters, built to specification, are in use in laundries, textile plants, hotels, hospitals, schools, apartment houses, office buildings and private residences. And Everdur has been adopted as the standard for non-rust tanks by leading manufacturers of domestic automatic storage heaters and hot water storage tanks (range boilers).

General Characteristics

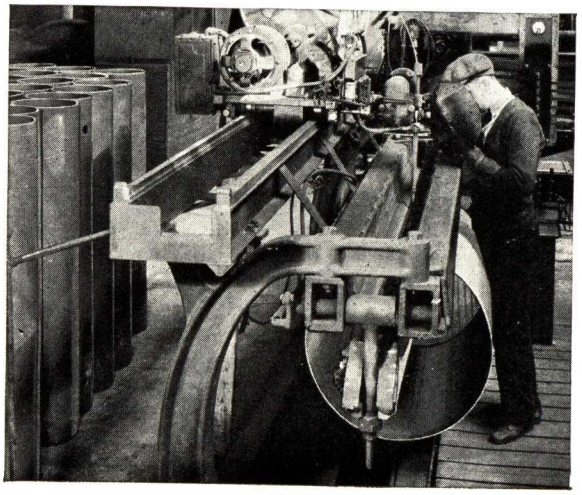
Strength—Hot rolled and annealed Everdur tank plate has a minimum tensile strength of 55,000 lbs. p.s.i. and a minimum yield point of 20,000 lbs. p.s.i. (taken at 0.5% extension under stress). The elongation is over 50% in 2 in. The minimum physical properties of annealed Everdur sheet as required by the A.S.M.E. Code are: Tensile Strength 50,000 lbs. p.s.i.; Yield Point 18,000 lbs. p.s.i.; Elongation 40% in 2 in.

Corrosion-Resistance—Everdur, generally speaking, is equal to or better than copper, in its resistance to the action of corroding agents. It is not generally subject to selective corrosion or pitting. This is also true of welds made with Everdur rod.



Upper Left:
Typical All-welded Everdur Storage Tank as Used by Manufacturers of Domestic Automatic Heaters

Lower Left:
Welding Head Into a 10,000-Gal. Electrically Welded Everdur Tank
Photo, courtesy Whitlock Coil Pipe Co.



Lower Right:
Automatic Arc Welding Seam of All-Welded Everdur Tank
Photo, Courtesy W. A. Case & Sons

Weld Characteristics—Everdur will meet all welding requirements of the A.S.M.E. Code for unfired pressure vessels (paragraphs U-20 and U-69), based on the above minimum physical properties.

Domestic Water Heaters

In the past decade the greatly increased use of brass and copper pipe for water lines is ample indication of the general recognition that rust is undesirable from every standpoint—convenience, upkeep and ultimate economy. In view of this it is only natural that the availability of Everdur has led to a rapidly growing use of non-rust tanks in the home.

In 1930 one of the largest manufacturers of gas-fired automatic storage heaters adopted welded Everdur tanks for a special model. Since that time the majority of leading heater manufacturers, both gas and electric, also oil, have standardized on Everdur for all rustproof tanks—significant evidence of the wide-spread acceptance of Everdur as the ideal non-rusting tank material.

Underfired Water Heaters—Because of immunity to rust, Everdur tanks provide high efficiency and most economical operation for underfired storage water heaters. There can be no accumulation of rust from tank corrosion at the bottom of the vessel to insulate the water from the heating element.

The majority of concerns making heating equipment for large public and private buildings and process plants are familiar with the fabrication of Everdur shells.

Typical Tests of Everdur Tanks

Large Tanks—Two 10,000-gal. accumulator tanks were made of ½-in. shells and heads of .650 in. and .750 in. in thickness. These tanks were given two tests of 24 hours' duration, each, under a constant hydrostatic pressure of 200 lbs. per sq. in. No sign of leak or distortion could be detected during either test period. The heaters, after being in continuous service for two years, were again successfully tested.

Domestic Tanks—Everdur tank units for domestic heaters have been subjected to even more drastic tests. One manufacturer making an all-welded tank from Everdur plates applied a test consisting of pulsating pressure in the tank from 0 to 150 lbs., 13 times a minute. Five hundred hours of this test are considered the equivalent of 20 years of normal service. Everdur tanks have been held on this test for over 1,000 hours without showing signs of leaks or distortion.

Where to Obtain Everdur Tanks and Heaters

Large Everdur Storage Heaters—Obtainable from most leading manufacturers of such equipment—several of whom have catalogs in this same section of "Sweet's" File.

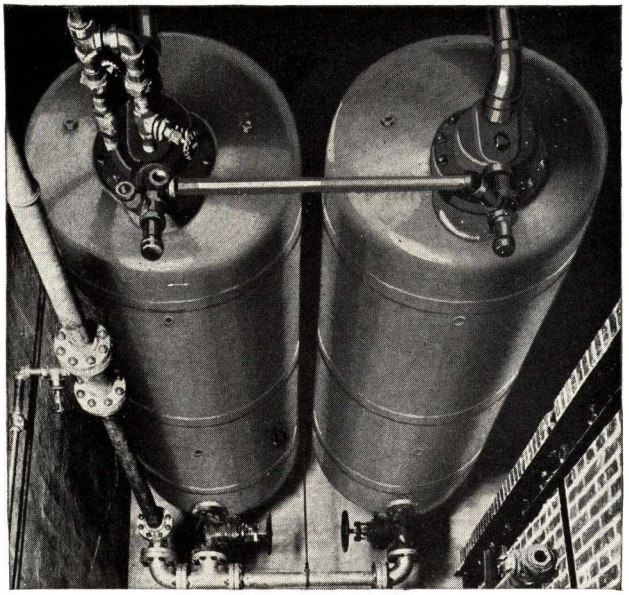
Domestic Automatic Heaters with Everdur Storage Tanks—Readily obtainable through usual trade channels, Everdur Metal is the standard material for non-rust tanks with 23 manufacturers of automatic gas water heaters, 12 manufacturers of automatic electric water heaters, and 11 manufacturers of automatic oil burning water heaters.

Domestic Storage Tanks (Range Boilers)—All usual sizes are made of welded Everdur Metal by 13 leading manufacturers. These are available through the plumbing and heating trade.

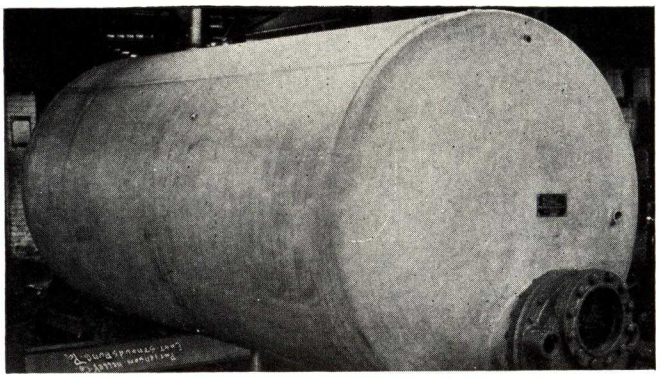
Descriptive Literature

ANACONDA Publication AE-10, containing detailed information regarding Everdur Metal for non-rust tanks —including tables of tank sizes and capacities—will be sent upon request.

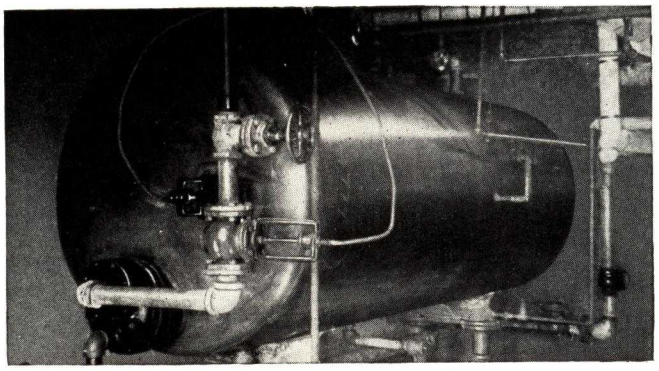
"Everdur" is a trade-mark of The American Brass Company; Reg. U. S. Pat. Off.



Two Everdur Tanks, Each Having a Storage Capacity of 424 Gallons, Built by Coulter Copper and Brass, Ltd., Montreal



Patterson-Kelley Everdur Water Heater Made by the Patterson-Kelley Company, Inc., East Stroudsburg, Pa.



Whitlock Everdur Type K Water Heater Made by the Whitlock Coil Pipe Company, Hartford, Conn.

WHITEHEAD METAL PRODUCTS CO.,

OF NEW YORK, INC.

Manufacturers of Monel Tanks and Heaters

MAIN SALES OFFICE

304 Hudson Street, NEW YORK, N. Y.

BRANCHES AND REPRESENTATIVES IN ALL PRINCIPAL CITIES

For Other Offices, see our catalog on Kitchen Sinks and Cabinets

WHITEHEAD MONEL RANGE BOILERS AND HOT WATER STORAGE SYSTEMS

Products

WHITEHEAD MONEL RANGE BOILERS; HOT WATER STORAGE TANKS; AUTOMATIC GAS STORAGE SYSTEMS with MONEL TANKS; INSULATED MONEL BOILERS.

For our catalog on Kitchen Sinks and Cabinets, see File Index.

Availability

All Whitehead Range Boilers and other items are distributed through reputable plumbing supply jobbers and regular plumbing supply sources.

Large stocks carried in principal cities.

SOLID MONEL TANKS PERMANENTLY ELIMINATE RUST OR CORROSION

Monel, already familiar to architects, is a solid alloy of approximately two-thirds nickel and one-third copper. It is a solid metal clear through with no coating to chip, crack or wear off and is silvery white in color. Monel has the strength of mild steel and will not rust. Its resistance to corrosion has made it the standard material for use in chemical and food plants where corrosion-resistance and purity of product are essential.

The adoption of Monel for construction of solid tank shells means that rust or corrosion of any type is completely and permanently eliminated. Chemicals which are often found in local water supplies, have no injurious effect on Monel.

Whitehead Monel Range Boilers are individually tested, hydrostatically, to the test pressure shown, which is over twice the pressure to which the tank will ever be subjected in actual use. All tanks are made to the Massachusetts Standards, which provide that working pressures shall not exceed 42½ per cent of the stamped test pressure.

Construction is of solid thick Monel throughout with top and bottom heavily reinforced. These tanks are carefully designed to prevent collapse from vacuum should the water main be drained without notice. All boilers up to 60 gallons fitted with three internal Monel rings of special design.

Tanks are all-welded on our patented welding machine especially developed by Whitehead Engineers for this work. This insures maximum strength and rigidity. Outlet spuds to our own construction, each spud carefully silver soldered to the shell, and tapped vertical New Style unless otherwise specified.

Extra or special tappings to order.

Whitehead Monel Range Boiler
*Reg. Trade-Mark

Monel Range Boilers

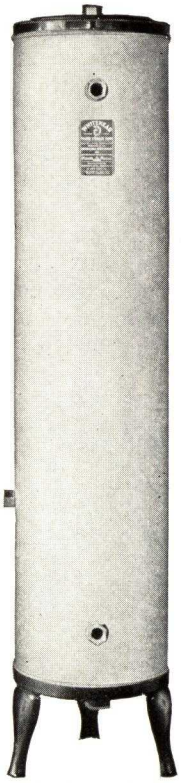
Whitehead Range Boilers have a high polish silvery finish, attractive and easily kept bright and shiny. This high polish has proven to be important as a natural insulator to retard loss of heat.

Whitehead Monel Range Boilers are made in the following standard types: New Style or Hi-low, Old Style or Low Tap, Universal or Thermostat Tap and Horizontal Tap.

Insulated Range Boilers

Whitehead Insulated Range Boilers are standard Monel boilers heavily insulated with 1½" of granulated cork, covered by a heavy enameled metal jacket to prevent all possible radiation. Standard finish is gray. Also furnished in colors to match perfectly all nationally advertised oil burners.

Whitehead Insulated Boilers are available in both horizontal and vertical types.



Whitehead Monel Insulated Range Boiler

Sizes and Weights

Constructed in 3 weights, the 200 lb. (85 lb. w.p.), the 250 lb. (106 lb. w.p.), and 350 lb. (148 lb. w.p.) same test pressures.

SIZES AND DIMENSIONS MONEL RANGE BOILERS

Cap., gal.	Diam., in.	Length, in.*
25	12	51
30	12	61
40	14	61
50	16	61
60	18	61
80	20	61
100	22	64

*Does not include stand.

SIZES AND DIMENSIONS MONEL INSULATED BOILERS

Cap., gal.	Diam., in.	Over-all height, in.*
30	15	73½
40	17	73½
50	19	73½
60	21	73½
80	23	73½
100	25	76

*For Horizontal Type deduct 12 in.

Twenty-Year Guarantee

The Whitehead Monel Range Boiler, as well as the Monel tanks in the insulated boiler and automatic storage heaters, carries the manufacturer's written twenty-year guarantee against rust and corrosion.

Whitehead Automatic Storage Heater—Side Arm Type

WHITEHEAD AUTOMATIC STORAGE WATER HEATERS

Side Arm Type

The Whitehead Side Arm type storage water heater has a Monel tank which carries the twenty-year guarantee. It is also equipped with snap action thermostat, safety pilot, heavy copper heating coil, heavy insulation with heavy outside shell. This heater is available in eight sizes in 300 lbs. test pressure tank.

DIMENSIONS OF SIDE ARM TYPE

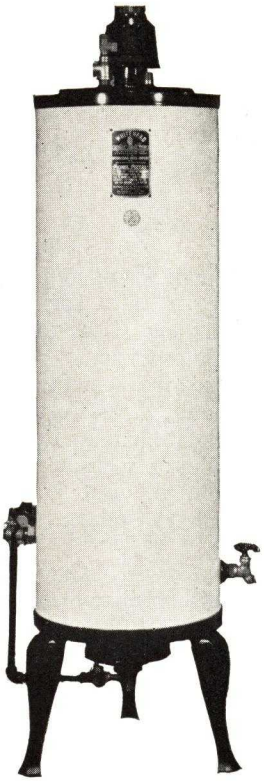
Cap., gal.	20	25	30	40	50	60	80	100
Diameter, in.	15	17	17	19	21	23	23	26
Height, in.	52	61½	61	61	61	61	74	76½
Gas consumption, B.t.u. per hr.	22,000	23,000	25,000	27,000	40,000	40,000	40,000	40,000
Length of heating coil	14′ 6″	17′ 6″	20′	22′	36′	36′	36′	36′
Recovery cap., gal. per hour	30.8	32.2	35	37.8	56	56	56	56

Underfired Fast Recovery

This system also has a Monel tank with the twenty-year guarantee. It is available in four sizes in 300 lbs. hydrostatic test pressure tank. The underfired type is likewise equipped with snap action thermostat, safety pilot, heavy insulation and heavy outside jacket.

DIMENSIONS OF UNDERFIRED FAST RECOVERY TYPE

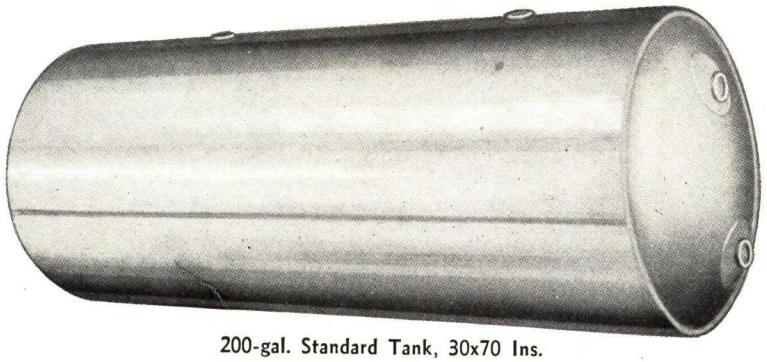
Cap., gal.	20	30	40	50
Diameter, in.	17	19	21	23
Height, in.	59	65	65	67½
Gas consumption, B.t.u. per hr.	20,000	22,000	25,000	30,000
Recovery cap., gal. per hour	28.0	30.8	35.0	42.0



Whitehead Automatic Storage Gas Heater—Underfired Type

WHITEHEAD LARGE MONEL STORAGE TANKS

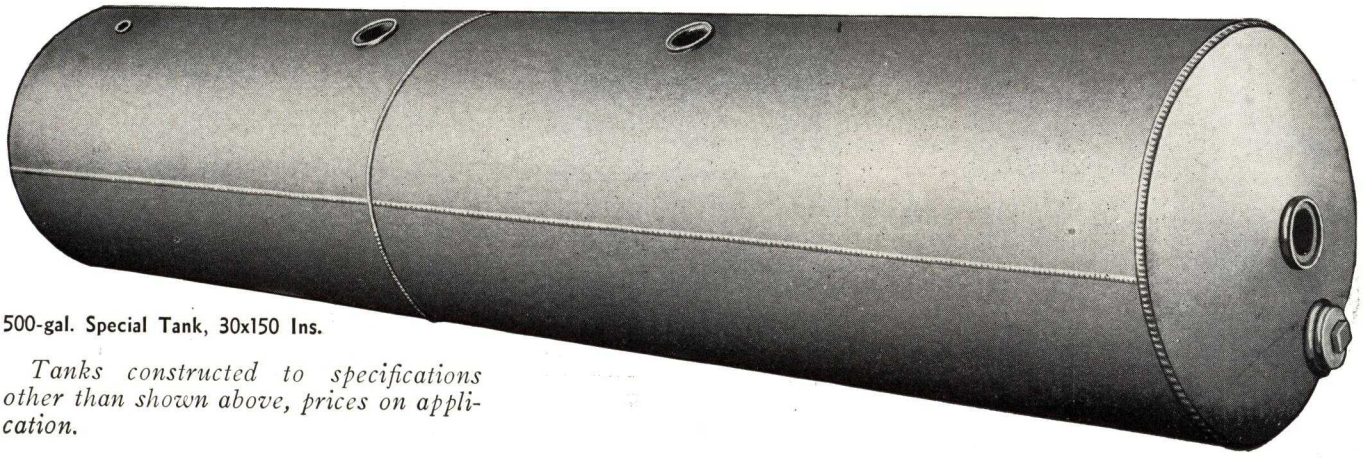
These tanks are available in 200 lbs., 250 lbs. and 350 lbs. test pressures and are guaranteed for 20 years.



200-gal. Standard Tank, 30x70 Ins.

DIMENSIONS OF WHITEHEAD STORAGE TANKS

Designated cap., gal.	Actual cap., gal.	Size, in.
125	123	24x60
150	146	24x72
180	196	30x60
200	226	30x70
250	270	30x84
300	306	30x96
300 alt.	306	36x72
350	392	36x84
400	445	36x96
450	498	36x108
500	550	36x120
500 alt.	550	42x84
600	608	42x96
700	680	42x108
800	752	42x120



500-gal. Special Tank, 30x150 Ins.

Tanks constructed to specifications other than shown above, prices on application.

W. E. CALDWELL CO.

INCORPORATED

Manufacturers of Tanks and Tank Towers

2290 Brook Street, LOUISVILLE, KY.

Products

WOOD, STEEL and GALVANIZED TANKS, any shape or size, for any purpose; TUBULAR, ANGLE or CHANNEL COLUMN STEEL and WOOD TOWERS.

Also manufacturers of Railroad Water Stations; Tank Agitators; Steel Standpipes; Tanners' Drums; Power Transmission Machinery which includes: Friction Clutches, Friction Clutch Cut-off Couplings, Cast Iron Pulleys, Shaft Hangers, Safety Set Shaft Collars.

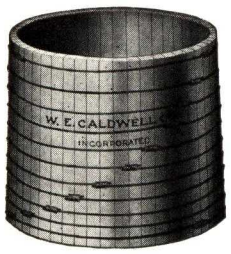
THE TANK WITH A REPUTATION
Caldwell
TANKS AND TOWERS
TRADE-MARK

Cypress Tanks

This company specializes in cypress, as it is the best wood for tanks for most purposes. It has great durability with minimum shrinking and swelling, and gives no taste or coloring.

For some acids, yellow pine is recommended. Poplar, white pine, cedar and fir are also used.

Made round, elliptical and rectangular.



Specifications—Lumber to be thoroughly dry, without loose or unsound knots, splits, shakes, pecks, wormholes or other defects; all heart on inside; sound sap on outside, and then not to exceed one-half of the thickness of stave.

Thickness—2 in. for 10,000 gal. or less; 2½ in. up to 20,000 gal.; 3 in. for larger sizes. Finished thicknesses to be ¼ in. less than above.

Standard Inside Diameters of Round Tank—Every 6 in. from 3 to 9 ft.; every foot to 16 ft.; and every 2 ft. above 16 ft.

Standard Inside Depths of Round Tanks—

1 ft. 5 in.	4 ft.	6 ft. 5 in.	15 ft. 4 in.
2 ft.	4 ft. 5 in.	7 ft. 5 in.	17 ft. 4 in.
2 ft. 5 in.	5 ft.	9 ft. 5 in.	19 ft. 4 in.
3 ft.	5 ft. 5 in.	11 ft. 5 in.	21 ft. 4 in.
3 ft. 5 in.	6 ft.	13 ft. 5 in.	23 ft. 4 in.

Finish—Staves to be dressed both sides with edges machine jointed to proper bevel. Bottom to be dressed on top side only with edges machine joined and square and well doweled.

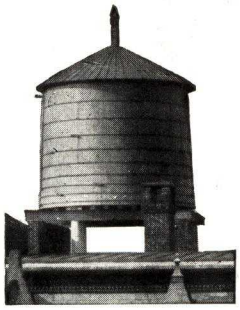
Hoops—Round hoops to be of wrought iron (not steel) with malleable iron draw lugs; sizes and spacing to give a factor of safety of 4 to 1 or greater if required.

We also manufacture rectangular tanks of all dimensions and capacities.

Our Research Department will be glad to go into any special problem with you.

Tank Covers—Standard wood covers are supported by trusses and rafters and covered with 1-in. sheathing and Ruberoid roofing.

Flat wood covers are also furnished for frost protection when specified.



Tank and Foundation, Colonial Hotel, York, Pa.

Tank Foundations

Realizing to what an extent the success of the tank depends on its foundation, we have made a careful study of tank foundations and have developed a series of standard designs which are not only of the proper strength but also use the minimum of material.

Steel Tanks

We make all types of steel tanks for above or below ground storage of water, oils, gasoline, alcohol and certain chemicals for industrial plants. They are furnished in all-riveted, all-welded and riveted and welded construction according to type. Tanks up to 10½-ft. diameter can be shipped set up.

Elevated Steel Tanks

We manufacture and erect both hemispherical bottom and elliptical bottom elevated steel tanks in capacities from 5000 to 500,000 gal. or more and towers in heights to 200 ft. or above for municipal water supply, fire protection, industrial and domestic service.

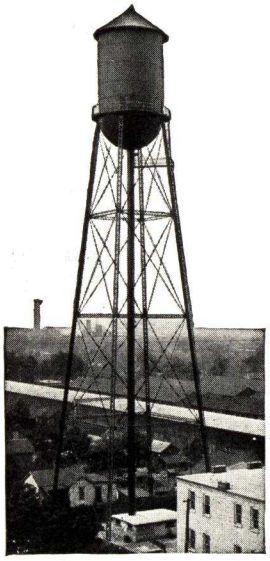
Elevated Wood Tanks

We make three types of steel towers for wood tanks—angle column, tubular column and laced channel column. We recommend the angle type for small sizes and the laced channel type for the larger sizes.

Standard—*Tubular*—Every 12 ft. from 15 ft. to 100 ft.

Angle—Every 10 ft. from 12 ft. up.

Latticed—Every 5 ft. from 20 ft. up.



150,000-gal. Tank, 205 Ft. High

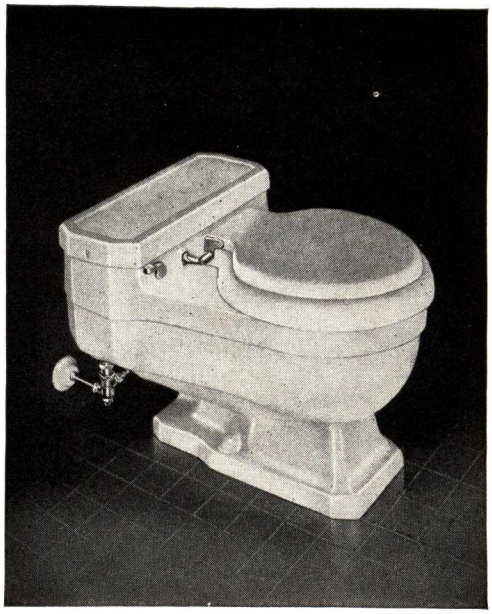
DIMENSIONS AND CAPACITIES OF STANDARD TOWER TANKS

Class towers	Capacity, gal.	Standard wood tanks: Diameter ft.	in.	Depth ft.	in.	Standard steel or galvanized tanks: Diameter ft.	in.	Depth ft.	in.
O tubular	1,000	6	6	4	5	6	0	5	0
or CC angle	1,500	6	6	6	5	6	6	6	6
A tubular	2,800	8	0	7	5				
or FF angle	3,000	8	0	8	5	8	0	8	0
B tubular	5,000	10	0	9	5				
or HH angle	6,000	10	0	11	5	10	0	10	0
C tubular	10,000	12	6	11	5	12	0	12	0
or JJ angle	12,000	12	6	13	5				
D tubular	15,000	14	0	13	5	14	0	14	0
or KK angle or LD latticed	17,000	14	0	15	5				
E tubular	20,000	16	0	13	5	16	0	14	0
or LL angle or LE latticed	22,000	16	0	15	5				
ES tubular or NN angle or LES latticed	25,000	16	0	17	4	16	0	18	0
F tubular	30,000	18	0	15	4	18	0	16	0
or PP angle or LF latticed	33,000	18	0	17	4				
FS tubular or LFS latticed	35,000	18	0	19	4	18	0	20	0
G tubular	36,000	19	6	17	4				
or LG latticed	40,000	19	6	19	4	20	0	18	0
LH latticed	50,000	22	0	17	4	22	0	18	0
	55,000	22	0	19	4	22	0	20	0

Hemispherical bottom steel tanks and towers are regularly made in capacities from 5,000 gal. up. Any of the above towers can be made to suit special conditions.

W. A. CASE AND SON MFG. CO.

33 Main Street, BUFFALO, N. Y.



No. 55-T/N

T/N ONE-PIECE WATER CLOSET

The first and finest one-piece water closet.

Made of the best twice-fired vitreous china in white and in a wide variety of colors.

Designed to meet the most recent trend in plumbing fixtures.

No elevated tank and not attached to wall. Can be installed in corners, under stairs or windows.

Simplified fittings assuring positive quiet performance. Special regulating stop, designed for either angle or straight supply, permitting volume regulation of water under all pressures.

Non-overflow.

Powerful, but quiet, centrifugal flushing action and strong cleansing rim flush.

Large bowl opening and water area.

Shelf type cover, locked on.

All exposed metal chromium plated.

Perfectly sanitary. Safeguarded to prevent any possible contamination of water supply.

Complete with sheet covered special seat, china bolt caps and closet screws in one crate.

The T/N furnished in the following seat styles:

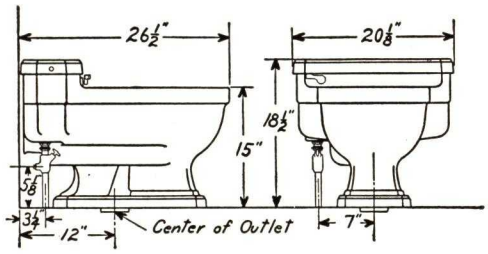
55A—With closed front seat with cover.

60A—With open front seat with cover.

65A—With open front seat less cover, and with check hinge.

80A—With hard rubber seat, open front less cover, and with check hinge.

85A—With hard rubber seat, open front with cover.



Roughing-in Dimensions No. 55

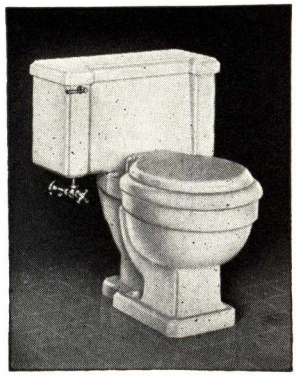
90A—With hard rubber seat, closed front with cover.

Note—Can be roughed at 12 in. or greater from wall to center of outlet. In roughing further than 12 in. from wall, change supply measurement accordingly.

We recommend 14-in. roughing, which gives more space behind fixture for cleaning purposes.

Vitreous china measurements subject to a variation plus or minus ¼ in.

DeLuxe Water Saver Closet



No. 1200—Regular Bowl
No. 1210—Elongated Bowl

Camel Water Saver Closet

No. 1300

Trojan Syphon Jet Flush Valve Closet

No. 1600—Elongated Bowl
No. 1625—Regular Bowl

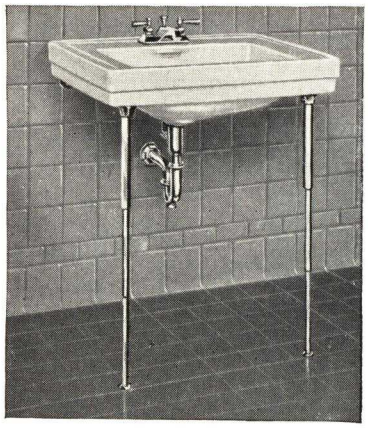
Tanks on Water Saver closets are not attached to wall, permitting any roughing-in 12 in. or over.

Tank fastened directly to shelf of bowl by means of a simple patented connection, affording unusual ease and economy of installation. Thoroughly efficient and cleansing flushing action at low water consumption.

Trojan syphon jet flush valve closet combination (trap passes 2½-in. ball) with open front rubber seat with check hinge.

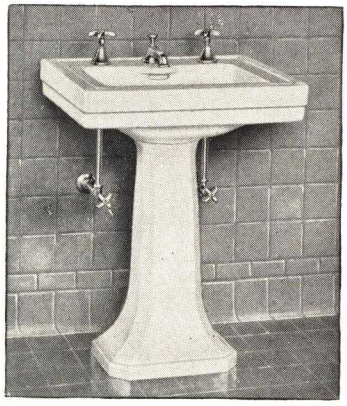
TWICE FIRED VITREOUS CHINA LAVATORIES

No. 400 Aqua-chrome—Equipped with chrome finish Art design adjustable legs and knee brackets with special locking device.
Square Basin Hooded Overflow
Anti-Splash Rim
Size 24x20″ Basin 16¾x12¼″
27x22″ 18½x13½″
No. 410—Same specifications as No. 400, except equipped with chrome finish towel bars.



No. 420 Aqua-chrome—Equipped with special Art design chrome finish combination supply and pop-up waste fitting (4″ centers), adjustable Art design chrome finish legs and knee brackets with special locking device.
Square Basin Hooded Overflow
Anti-Splash Rim
Size 24x20″ Basin 16¾x12¼″
27x22″ 18½x13½″

No. 430 Aqua-chrome—Equipped with special Art design chrome finish combination supply and pop-up waste fitting (4″ centers), adjustable Art design chrome finish metal legs, and knee brackets with special locking device and Art design chrome finish towel bars.
Square Basin Hooded Overflow
Anti-Splash Rim
Size 24x20″ Basin 16¾x12¼″
27x22″ 18½x13½″

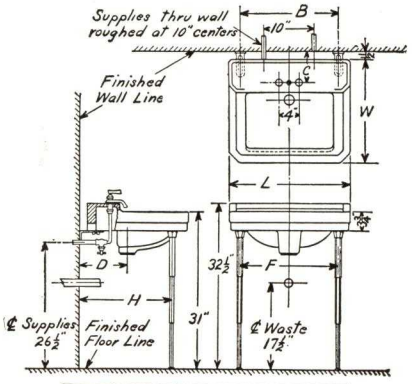


No. 500 Westbrook—Equipped with chrome finish knee brackets with special locking device.
Square Basin Hooded Overflow
Anti-Splash Rim
Size 24x20″ Basin 16¾x12¼″
27x22″ 18½x13½″
No. 510—Same specifications as No. 500, except equipped with chrome finish towel bars.

No. 620 Wyngate—Equipped with special Art design chrome finish combination supply and pop-up waste fitting (4″ centers), adjustable concealed hangers with chrome finish brackets with special locking device.
Square Basin Hooded Overflow
Anti-Splash Rim
Size 20x18″ Basin 15¾x10¾″
24x20″ 16¾x12¼″
27x22″ 18½x13½″
No. 630—Same specifications as No. 620, except equipped with chrome finish towel bars.
Above lavatories, sizes 24″x20″ and 27″x22″ furnished with cut off corners when specified.

No. 720 Windsor—Equipped with special Art design chrome finish combination supply and pop-up waste fitting (4″ centers) and chrome finish knee brackets with special locking device.
Square Basin Hooded Overflow
Anti-Splash Rim
Size 20x18″ Basin 15¾x10¾″
24x20″ 16¾x12¼″
27x22″ 18½x13½″
No. 730—Same specifications as No. 720, except equipped with chrome finish towel bars.

No. 800 Winston—With integral shelf, equipped with special chrome finish Art design combination supply and pop-up waste fitting (4″ centers), chrome finish Art design, adjustable legs and knee brackets with special locking device.
Concealed Front Overflow Anti-Splash Rim
Square Basin
Size 22x18″ Basin 15½x10¾″
24x20″ 17½x11⅜″
27x22″ 18½x13″



NOMINAL SIZE	W	L	B	D	C	F	H
22x18	18¼″	22¼″	18⅛″	8⅛″	5⅛″	18½″	16⅞″
24x20	20¼″	24⅛″	19¼″	9½″	6⅛″	19¾″	18½″
27x22	22⅜″	27¼″	22⅛″	10⅛″	6¼″	21⅞″	20½″

Roughing-in Dimensions of No. 800, 805, Winston Lavatory
Vitreous chinaware measurements subject to a plus or minus ¼″ variation.

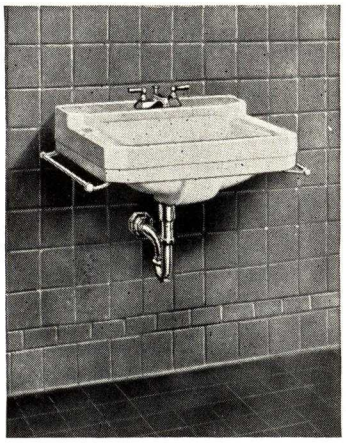
No. 805 Winston—With integral shelf, equipped with special chrome finish Art design combination supply and pop-up waste fitting (4″ centers), chrome finish Art design adjustable legs and knee brackets with special locking device, and chrome finish towel bars.
Concealed Front Overflow Anti-Splash Rim
Square Basin
Size 22x18″ Basin 15½x10¾″
24x20″ 17½x11¾″
27x22″ 18½x13″

TWICE FIRED VITREOUS CHINA LAVATORIES

No. 820 Warwick—With integral shelf, equipped with special chrome finish Art design combination supply and pop-up waste fitting (4″ centers), adjustable concealed hangers with chrome finish brackets with special locking device.

Concealed Front Overflow	Anti-Splash Rim
Square Basin	
Size 22x18″	Basin 15½x10¾″
24x20″	17½x11¾″
27x22″	18½x13″

No. 825—Same specifications as No. 820, except equipped with chrome finish towel bars.



No. 841 Winsted—With integral shelf equipped with special chrome finish Art design combination supply and pop-up waste fitting (4″ centers)—and chrome finish towel bars. Lavatory supported by concealed wall hanger.

Concealed Front Overflow	Anti-Splash Rim
Square Basin	
Size 22x18″	Basin 15½x10¾″

No. 840—Same specification except with towel bars.

No. 850 Robson—With integral shelf, equipped with special chrome finish Art design combination supply and pop-up waste fitting (4″ centers), chrome finish Art design adjustable legs, and concealed wall hanger.

Concealed Front Overflow	Anti-Splash Rim
Size 24x20″	Basin 16x11¼″
27x22″	18x12½″
30x22½″	18x12½″

No. 855—Same specifications as No. 850, except with 3-valve supply and waste fitting.

No. 925 Cosmette—With integral shelf equipped with special chrome finish Art design combination supply and pop-up waste fitting (4″ centers), supported on concealed steel plate wall hanger.

Concealed Front Overflow	Anti-Splash Rim
Size 20x13½″	Basin 13¾x8½″

No. 930—Same specification as No. 925 except equipped with chrome finish towel bars.

No. 935—Art design fitting with bead chain and rubber stopper.

No. 910 Avon—With back supported on concealed wall hanger. Equipped with special chrome finish round design combination supply and pop-up waste fitting (4″ centers).

Concealed Front Overflow		Anti-Splash Rim
Size	19x16″	20x18″
Square Basin	16x9½″	15x10½″
Back	5″	6″

No. 912—Same specification as No. 910 except equipped with chrome plated Art Design fitting.

No. 900 Avon—With back, supported on concealed hanger.

Concealed Front Overflow		Anti-Splash Rim
Size	19x16″	20x18″
Square Basin	16x9½″	15x10½″
Back	5″	6″

"EASTERN" RANGE BOILERS—STORAGE AND PNEUMATIC TANKS

Special Tanks Built to Specification

Manufactured from steel and copper bearing steel in black and galvanized; also from copper.

Made of best materials obtainable and by skilled workmen and most modern equipment. All tanks fabricated by the welded process using a built-up weld assuring the maximum in strength and tightness. Every tank thoroughly tested and inspected before shipment.

Range Boilers

Range Boilers manufactured in a complete line of sizes and weights from steel and copper. Forgings used throughout for spuds, accurately tapped to Briggs standard gauge. Galvanized Barber Boilers with stands, Expansion Tanks and painted Basement Tanks for closed hot water heating systems. Range Boilers with galvanized or copper coils for vertical or horizontal installations.

Storage Tanks

Storage Tanks (including 60 in. in diameter) in black and galvanized steel and copper. Furnished in standard (65 lb. working pressure) and extra heavy 100 lb. working pressure. When required, storage tanks can be furnished with manhole, handhole, black, galvanized or copper coils for either vertical or horizontal installation.

Pneumatic Tanks

Pneumatic Tanks in all sizes including 60 in. diameter in black and galvanized for maximum working pressure of 75 lb. Heavier tanks built to specification. Tapping location and sizes to meet any requirements.

CRANE CO.

Plumbing Fixtures, Valves, Fittings, Pumps and Heating Materials

CRANE CO. GENERAL OFFICES
836 South Michigan Avenue, CHICAGO, ILL.
BRANCHES AND SALES OFFICES IN 160 CITIES
For our page on Boilers, Radiators and Valves, see File Index

"IF IT'S PLUMBING, CRANE HAS IT"

No matter what your client's tastes are or what the size of his purse may be, in the Crane line there is always a solution to the buyer's needs.

Tubs, closets, lavatories, showers . . . of modern design, colors and mechanical conveniences; efficient sinks and cabinets; lavatories for additional washing facilities; modern laundry tubs—and all fixtures, valves, fittings, and piping specialties—all are in the Crane line and specified in the Crane Architect's Catalog No. 675 C.

Make it your habitual reference book on plumbing and heating. It is complete, accurate, invaluable. Make one set of specifications—CRANE—adopt one responsibility and one standard of quality. CRANE Co's. network of branch offices and display rooms are at your service.

CRANE BATHROOM SUITES

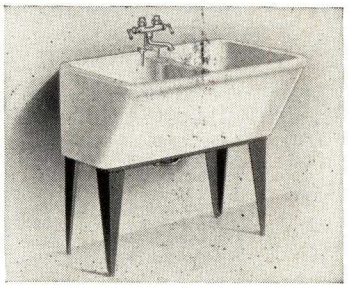
In bathroom suites, Crane offers an unlimited choice of styles from the smartly ultra-modern to the beautiful but more conservative—on down to the moderately priced and more conventional bathroom. Each is distinctively individual in its beauty and symmetry—created under the guiding hands of true artists. Though every item has its own characteristic design, it is nevertheless an ideal companion piece for many others selected from similar style groups.

Complementary to this broad range of styles is the color treatment of Crane vitreous china and porcelain-enameled cast iron. In eight beautiful shades, Crane offers almost unlimited possibilities in the creation of lovely bathroom color ensembles. All working parts are up-to-date in design and mechanical operation—positive in action, and built for long service without replacements. Convenient location of hand controls and unit control panels makes for greater ease of operation.

When you Crane-Equip a bathroom, you insure lasting satisfaction from the hidden pipe and fittings to the lustrous chromium plated fixtures and controls. These permanent accents of beauty are symbolic of the quality built into all Crane products. Crane's 80-year-old reputation is your client's guarantee of dependable, trouble-free performance, at minimum cost.

At the right, above, is one of many Crane quality bathrooms suitable for the modern home and well within the reach of the average owner. The bath is the porcelain enamel *Neuvogue* with shower. The center panel forms a convenient seat. Tub bottom has exceptionally large flat area. *Deviator* spout directs water to shower or bath. Shower head is adjustable. Styles for corner or recess.

The closet is the *Monada*—a graceful, one-piece, vitreous china closet with sure-flush siphon jet. Quiet in action. Made with plain or elongated rim. The lavatory is the *Corwith Compeer*. Beautiful—conservative. Top of vitreous china. Legs are chromium plated. Has handy shelf-back and easy-control, beveled fixture panel. Lever-controlled waste. Towel bars optional. Sizes: 22 x 18 and 27 x 22 in. Back, 4 in. high.



Below:
C 19150 Crane *Sunnyday* porcelain enameled cast-iron cabinet sink, the heart of the modern efficient kitchen. Supply fixture on convenient angle panel, with retractable spray, depressed drainboards, and ledges for glassware. Surprisingly great storage facilities in all-steel cabinet. Size: 60 x 25¼ in. Available with back extended across end for corners, or across both ends for recess installations. Send for details of "Crane-Efficient Kitchens."

Left:
C 281 *Coronet* vitreous china Cabinet Lavatory with spacious basin. Controls on beveled panel, out of the way. Front slightly concaved for closer approach. Baked enamel all-steel cabinet. Large doors, with built-in shelves, piano hinges. *Securo* quick-draining waste. In white or Crane colors. Towel bars optional. Size: 24 x 20 in.

Above:
C 21147 *Everbrite* gleaming white porcelain (all-clay) two-compartment laundry tub with integral overflow. Hard glass-like surface, unaffected by strong alkalies and ordinary acids; one-piece construction with rounded, easily cleaned inside corners. Rigid steel support with leveling adjustments. Sizes: 40 x 22 and 46 x 24 in.

Crane Water Systems

Crane Water Systems are built especially for homes or other small buildings where no municipal water supply is available—also for booster and air-cooling purposes. They consist of a shallow or deep well pump and tank with automatic electric motor or semi-automatic gasoline engine and accessories. Capacities range from 170 to 1000 gal. per minute. They are ideal for tourist camps, schools, churches, summer cottages, filling stations, small industrial plants, stores, railroad and bus stations, country estates and clubs.

Crane Hot Water Heaters

The Crane automatic storage gas water heaters provide "piping hot" water at all hours of the day or night, economically, safely and trouble-free. Completely insulated, sturdily built, made in capacities ranging from 20 to 99 gals.

Crane Water Softeners

The Crane *Warlo* water softener is sturdily built, simple in construction and easy to install. Operates by a single multiport, hand valve. Tanks are of heavy steel, galvanized inside and out. Made in 5 sizes, ranging in tank diameters from 9 to 22 ins. Larger capacities available for industrial purposes.

A. F. CURTIN VALVE CO.

Manufacturers of Noiseless Water Closet Tank Fittings

MEDFORD, MASS.

All Leading Plumbing Supply Houses Will Now Equip Tanks with Curtin Fittings

Products

CURTIN NOISELESS TANK FITTINGS for low down water closet tanks include the "CURTIN-VICTORY" VALVE, the "CURTIN-LEVER," and the "CURTIN-ROTARY" BALLCOCKS.

How to Specify

The specification, "Curtin Victory Flush Valve, Curtin Rotary Ballcock and Curtin Lever," with the figure number indicated under cross sectional views below, will insure the installation of these noiseless tank fittings on your work.

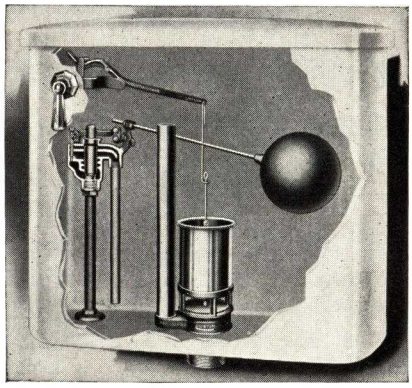
"Curtin-Victory" Valve

Has a full, unrestricted waterway and starts the syphon action immediately. It will operate even the largest closet with a minimum amount of water. It takes out all the water and the tank fills with clean water. *Automatically refills any closet. No refill tube from ballcock is required.*

This valve is silent in operation, lifts easily, and has an encased leather seat washer, which will last for many years, doing away with the usual leaks, and perpetual replacing of rubber balls.

All metal parts are machined from cast bronze.

Cylinder and overflow tube furnished in electrolytic seamless drawn copper.



Curtin Noiseless Fittings Installed in Low Tank (Ballcock shown in cross section)

They will fit and operate in any low tank for any style of water closet and are often used on replacements. These fittings afford a most silent, sanitary, and satisfactory method for the flushing of water closets. A particularly desirable feature in homes, apartments, and hotels.

"Curtin-Rotary" Ballcocks

We are the originators of the rotary ballcock, which was the first silent ballcock. Time has shown that revolving the stream of water, as in the "Curtin-Rotary" Ballcock, is the only practical method of eliminating noise. On very low pressure, opening the by-pass screw "A" permits free passage of water through ballcock and insures quick filling of tank. With its powerful compound leverage, ballcock will operate satisfactorily under any pressure. Made of cast bronze and copper.

Back supply type with integral stop furnished for concealed connection through the back of tank. Rotary ballcocks can also be supplied adapted for high tanks in the bathroom or expansion tanks in the attic. (See illustrations.)

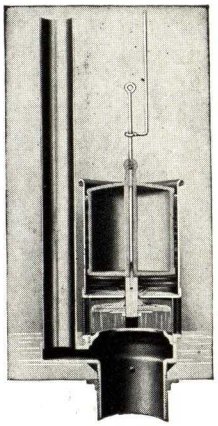


Fig. 40

Sectional View "Curtin-Victory" Flush Valve

Float slowly falling as water leaves float chamber; valve but partly closed, yet tank already emptied

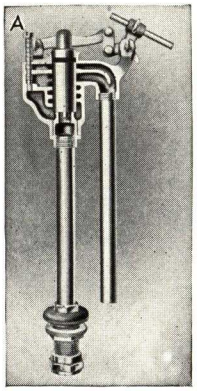


Fig. 100
Sectional View "Curtin-Rotary" Bottom Supply Ballcock for Low Tank

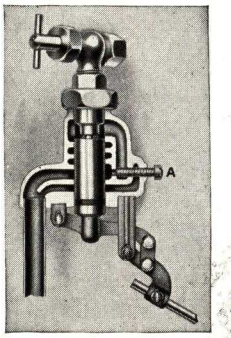


Fig. 120
Sectional View "Curtin-Rotary" Back Supply Ballcock for Low Tank

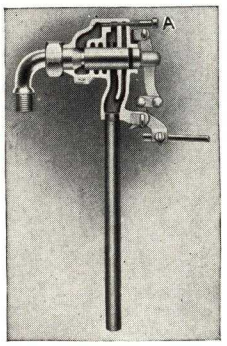


Fig. 130
Sectional View "Curtin-Rotary" Top Supply Ballcock for High Tank

"Curtin-Lever" (Handle with Separate Escutcheon)

The "Curtin-Lever" is machined from bronze castings. Strong and always in alignment. There are no stamped parts. Once attached to the tank, it will neither work loose nor shift position. This double action lever has metal to metal bearings and exerts a powerful lift in either direction with a slight touch of the handle.

Fig. 530
All Metal Handle and Escutcheon Chrome Plated

Fig. 520
Colonial Handle Self-adjusting Escutcheon

Fig. 500
Regular Handle Self-adjusting Escutcheon

DALMO MANUFACTURING CO.

Manufacturers of Kramer Flush Valves

511 Harrison Street
SAN FRANCISCO, CALIF.

EXCLUSIVE REPRESENTATIVES—DALMO SALES CORP.—511 HARRISON STREET, SAN FRANCISCO, CAL.

NEW YORK, N. Y., Boig & Hill, Inc., 87 Barclay St.
BALTIMORE, MD., Building Service, 309 Guilford Ave.
SEATTLE, WASH., J. W. Mitchell, 1515 Bellvue Ave.
CHICAGO, ILL., J. A. Garvey, 5322 N. Monroe
PHILADELPHIA, PA., Bymor Sales Corp., 322 New St.
El PASO, TEX., Momsen-Dunnegan & Ryan
ST. LOUIS, MO., Thomas J. Corrigan, 2501 St. Louis Ave.
NEW ORLEANS, LA., Clifford A. King, 901 Masonic Temple
LOS ANGELES, CAL., J. N. Fitzpatrick, Boyle and Slavson Aves.

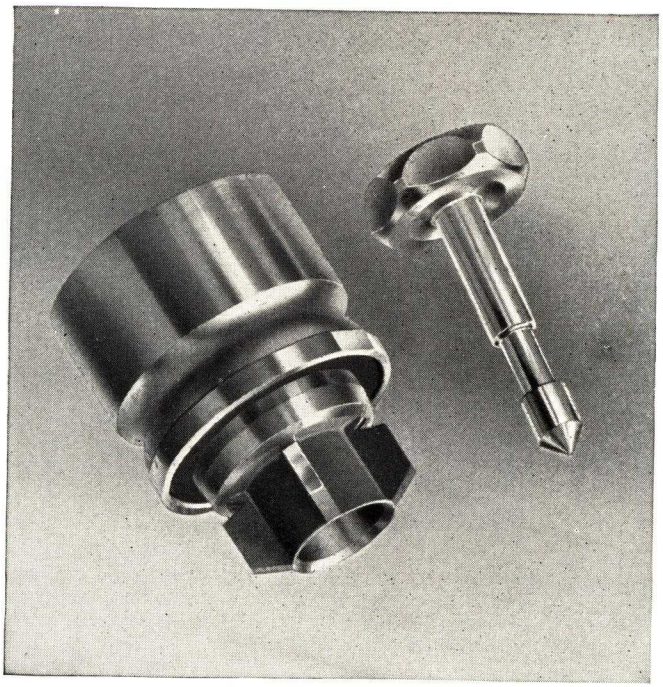
KRAMER FLUSH VALVES

A Dalmo DALMO Since 1912 Product

Distinctive Features

A valve of basic practical design
No small bypass port
Quiet and positive action
Conforms to federal specifications
WW-P-541 page 30 E-10 J
Saves water consumption

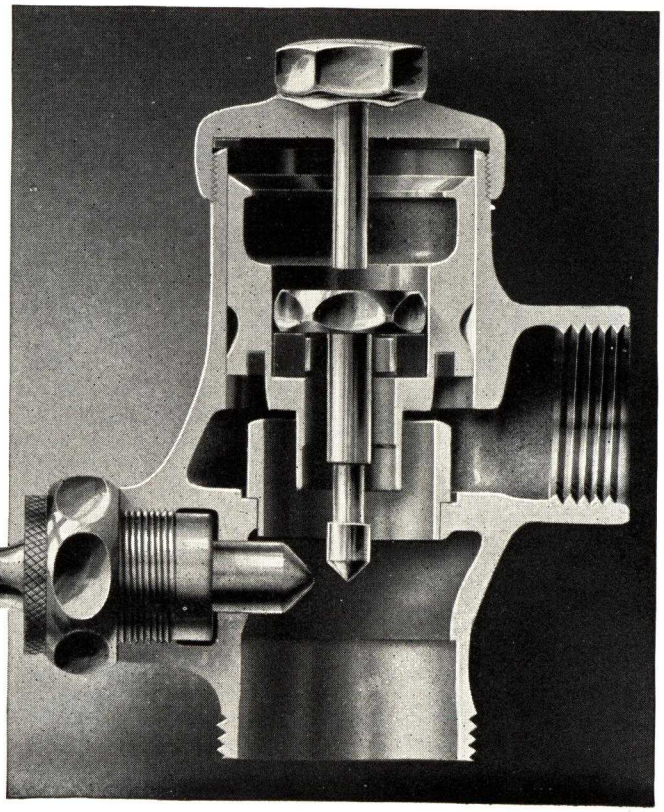
Manufactured by Dalmo Precision Methods
No diaphragm or leather cup washers
Only two major working parts
Not affected by sand or grit
Operates on high or low pressure
Conforms to standard dimensions
Low maintenance cost



Only Two Major Working Parts

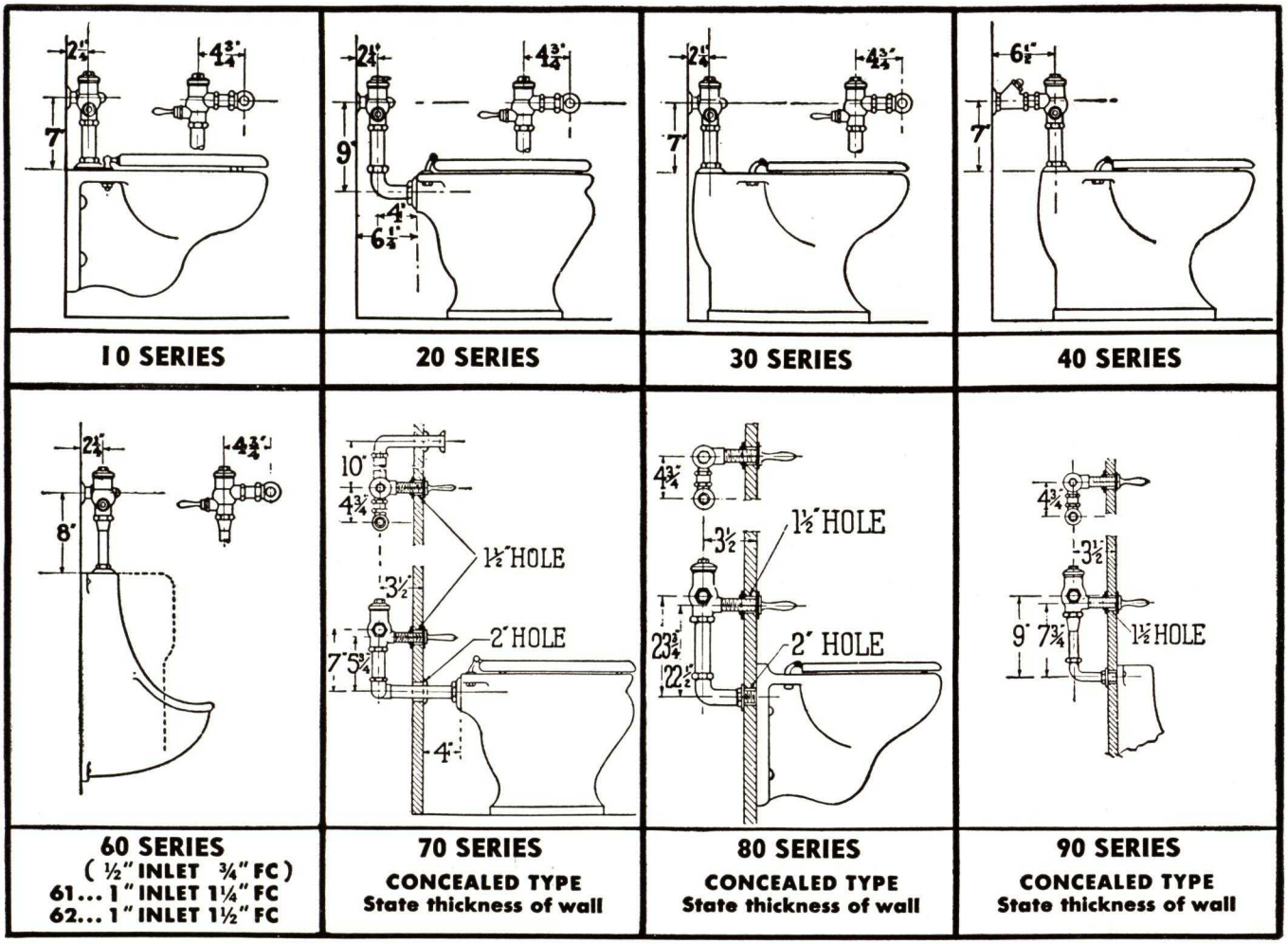
Salt Water Type

Conforms to United States Navy Specifications 30-V-1 (Flush Valves for "Salt Water" installation).

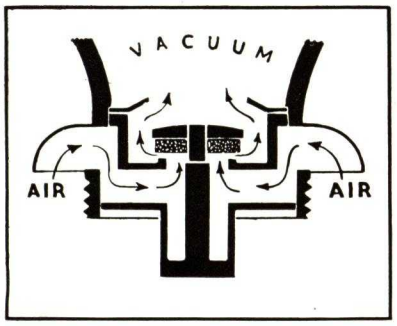


Standard Valve

Important—*Specify if vacuum breakers are required on flush valves.*

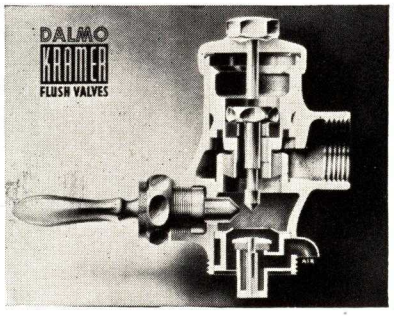


All Kramer Flush Valves Furnished Complete As Shown Above On Various Style Numbers



Vacuum Breaker Flush Valve

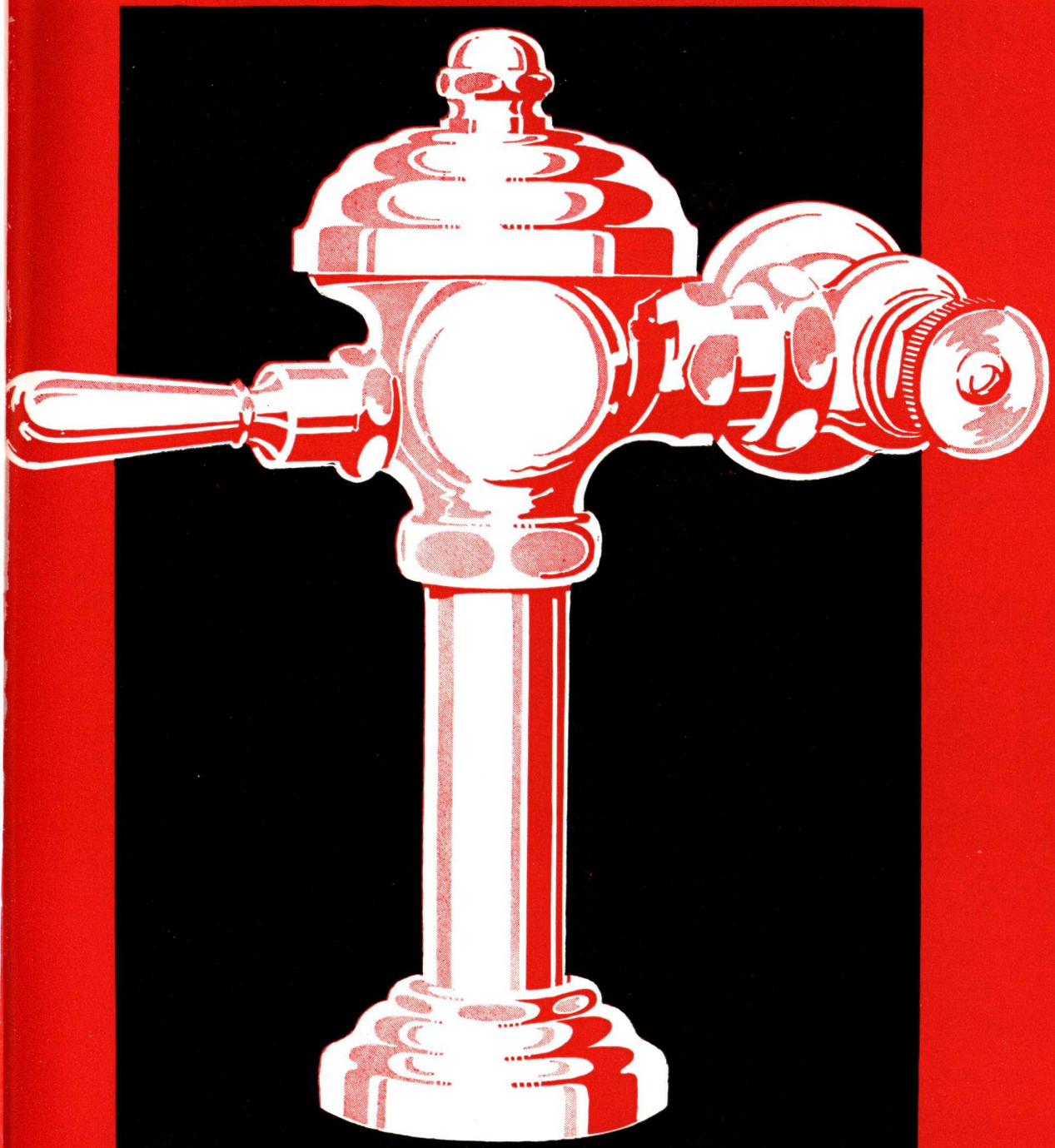
Dalmo engineers have developed a vacuum breaker, integral with the valve. This is an important consideration and leading engineers and plumbing officials prefer the integral vacuum breaker to one in flush connection as it insures against substituting a standard flush connection, thereby destroying the non-syphoning feature of the valve.



Partial List of Installations

Alcatraz Federal Prison, Alcatraz Island, Cal.
World's Fair Administration Bldg., San Francisco, Cal.
42 Broadway, New York, N. Y.
Western Furniture Bldg., San Francisco, Cal.
Public Schools, Los Angeles, Cal.
Camarillo State Hospital, Camarillo, Cal.
Hotel Pasa Del Norte, El Paso, Tex.
Hudson River State Hospital, Poughkeepsie, N. Y.
Public Schools, San Francisco, Cal.
U. S. Navy, Mare Island, Cal.
Hale Bros. Department Store, San Francisco, Cal.
101 Park Ave., New York, N. Y.
S. S. White Dental Mfg. Co., Philadelphia, Pa.
Fairmont Hotel, San Francisco, Cal.
Gunther Brewing Co., Baltimore, Md.
Psychopathic Hospital, San Francisco, Cal.
Beechnut Packing Co., Canajoharie, N. Y.
Vanderbilt Building, New York, N. Y.
Mills Tower Bldg., San Francisco, Cal.
Financial Center Bldg., San Francisco, Cal.
U. S. Federal Prison, San Pedro, Cal.
Laguna Honda Home, San Francisco, Cal.
University Club, New York, N. Y.
U. S. Letterman Hospital, San Francisco, Cal.
Murietta Hot Springs, Murietta, Cal.
Home of Good Shepherd, San Francisco, Cal.
Dollcare Apartments, 380 Vermont Ave., Los Angeles, Cal.
Norwalk State Hospital, Norwalk, Cal.
San Diego Naval Base, San Diego, Cal.
Rochester General Hospital, Rochester, N. Y.
San Quentin Prison, San Quentin, Cal.
Kezar Stadium, San Francisco, Cal.
California Commercial Union Bldg., San Francisco, Cal.
Hotel Montclair, New York, N. Y.
Hotel Moritz, New York, N. Y.
E. I. duPont deNemours & Co., Pompton Lakes, N. J.
and many others

MEMORANDA



Watrous

FLUSH VALVES

made solely by THE IMPERIAL BRASS MFG. CO. CHICAGO

THE IMPERIAL BRASS MFG. CO.

1200 WEST HARRISON ST., CHICAGO, ILLINOIS

Foreword

● Experience, approximating a half a century in the manufacture of brass and bronze devices of all kinds, contributes to the outstanding perfection of the Watrous Sanitary Appliances.

● Entering the field of sanitary engineering supported by this experience, backed with ample financial resources and unexcelled manufacturing facilities, our engineers and designers were able to create sanitary appliances far beyond the accepted standards of the time.

● In the spirit of progression and improvement we have steadfastly kept abreast of the increasingly exacting demands of this important field of sanitation as evidenced by the sanitary appliances illustrated in the following pages.

● With beauty in design, efficiency in operation, and adaptions for every requirement, Watrous Sanitary Appliances are universally accepted for the most exacting service and can be used on Plumbing Fixtures of any manufacture.

Architectural Service

Imperial engineers work in close cooperation with architects, jobbers and plumbers in the interest of the builder, the architect and the manufacturer.

Architects are invited to call on us for helpful suggestions on any unusual problems. If more complete details are required, please write our main office.

Imperial representatives are located in the principal cities. See back cover.

A Few Typical Watrous Installations

Watrous Flush Valves have been installed in many of the best known apartment, hotel and office buildings all over the world. A partial list of installations is listed below.

FISHER BUILDING,
Detroit, Mich.
LA SALLE-WACKER BLDG.,
Chicago, Ill.
MORRISON HOTEL,
Chicago, Ill.
CHICAGO DAILY NEWS BLDG.,
Chicago, Ill.
SOUTHWESTERN BELL TELEPHONE BLDG.,
St. Louis, Mo.
PARK PLAZA APT. HOTEL,
St. Louis, Mo.
HEYBURN BLDG.,
Louisville, Ky.
ELKS' CLUB BUILDING,
Memphis, Tenn.
BELL TELEPHONE BLDG.,
Dallas, Texas
MARK HOPKINS HOTEL,
San Francisco, Calif.
EASTERN-COLUMBIA BLDG.,
Los Angeles, Calif.
THE TEXAS COMPANY BLDG.,
Los Angeles, Calif.
HOTEL BANKHEAD,
Birmingham, Ala.
AMERICAN INSURANCE UNION TOWER,
Columbus, Ohio
WILLIAM TAYLOR HOTEL,
San Francisco, Calif.

MASONIC TEMPLE,
St. Louis, Mo.
STEUBEN CLUB,
Chicago, Ill.
MISSOURI PACIFIC BLDG.,
St. Louis, Mo.
GENESEE VALLEY TRUST BLDG.,
Rochester, N. Y.
PLYMOUTH HOTEL,
New York, N. Y.
STATE HOSPITAL,
Coxsackie, N. Y.
HOTEL, SANITARIUM & DRINK HALL,
Saratoga Springs, N. Y.
STATE SCHOOL,
Albion, N. Y.
ROCKLAND STATE HOSPITAL,
Orangeburg, N. Y.
STATE HOSPITAL,
Gowanda, N. Y.
STATE PRISON,
Attica, N. Y.
AMBASSADOR BUILDING,
St. Louis, Mo.
LA SALLE APARTMENTS,
Birmingham, Ala.
THE ARENA,
St. Louis, Mo.
THE CHICAGO STADIUM,
Chicago, Ill.

BENDIX BUILDING,
Los Angeles, Calif.
SIANI TEMPLE,
Los Angeles, Calif.
1700 WALNUT STREET BLDG.,
Philadelphia, Penna.
BARLUM TOWER,
Detroit, Mich.
WESTCHESTER APARTMENTS,
Washington, D. C.
ALBANY COUNTY JAIL,
Albany, N. Y.
CONTINENTAL LIFE INSURANCE CO.,
St. Louis, Mo.
TATTNALL COUNTY JAIL,
Reidsville, Ga.
GENERAL MOTORS PLANT,
Los Angeles, Calif.
TEXTILE CENTER BUILDING,
Seattle, Wash.
DYAS BUILDING,
Hollywood, Calif.
BISMARCK HOTEL,
Chicago, Ill.
LOYOLA UNIVERSITY BLDG.,
Chicago, Ill.
WYANDOTTE SCHOOL,
Kansas City, Kan.
BUS TERMINAL AND HOTEL,
Kansas City, Mo.

Watrous FLUSH VALVES

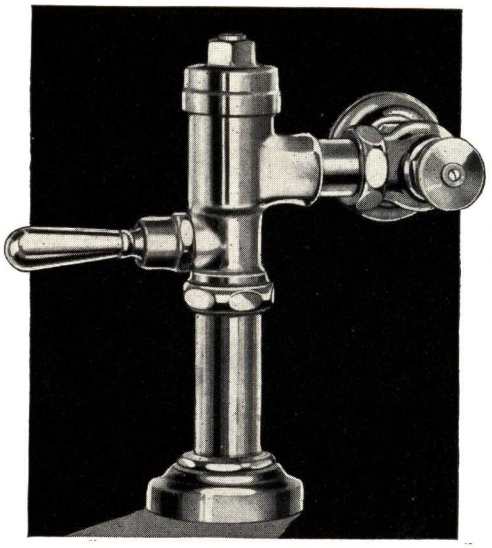
MAJESTIC FLUSH VALVE

A valve of the time-proven diaphragm type, for use on all types of fixtures and in all standard combinations. Noted for water economy, simplified installation and consistent efficiency because of special engineering features: (1) SIMPLICITY OF REGULATION—Valve is easily adjusted to the minimum amount of water necessary for the fixture with which it is used by a SLIGHT TURN OF A SCREW. No need to shut off water or take valve apart. (2) SELF-CLEANSING BY-PASS. By-pass is thoroughly cleansed at each operation of the valve. This assures against lengthening of the flushing time. (3) FULL WATERWAY. A diaphragm area 25% greater than the average enables this valve to operate successfully even on low pressures. Delivers all available water and has "punch" necessary to cleanse fixture thoroughly. (4) EASE OF OPERATION. A slight pressure on the handle in any direction insures a quick, thorough flushing. . . . Body is of high grade bronze heavily nickel or chromium plated.

IMPERIAL FLUSH VALVE

A valve of the piston type carefully designed and ruggedly built to provide lasting, reliable service. Available for all types of fixtures and in all standard combinations. Offers same SIMPLICITY OF REGULATION, same SELF-CLEANSING BY-PASS and same EASE OF OPERATION as described for MAJESTIC VALVE. A special feature of this valve is the full travel of the piston. This assures a full waterway which will give the proper rate of flow to flush thoroughly the most exacting fixtures and is particularly desirable on low pressures. The full travel also guards against scoring of cylinder walls and cup leathers through scaling, reducing service requirements to a minimum. As standard equipment this valve contains the NON-HOLD-OPEN FEATURE which assures that only a single flush takes place regardless of how long the handle is held—a decided factor in saving water. Body is of high grade bronze, nickel or chromium plated.

JEWEL FLUSH VALVE



This valve is also of the piston type and is designed to combine efficient, enduring service with maximum economy. Available in all standard combinations for any plumbing fixture requiring flushing service.

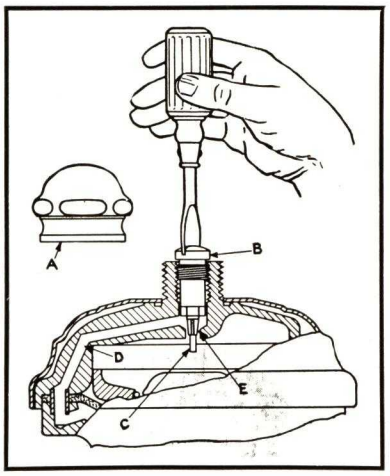
Valve can be easily adjusted by means of a turn of a screw to provide the proper length of flush for fixtures of any type. Has double by-pass channel which is cleansed every time the valve is flushed, insuring against lengthening of flush. Features full travel of piston similar to that described above for Imperial valve.

Valve will provide a uniform delivery of water from the highest to the lowest pressures—an important protection against water waste.

Constructed of high grade bronze heavily nickel or chromium plated.

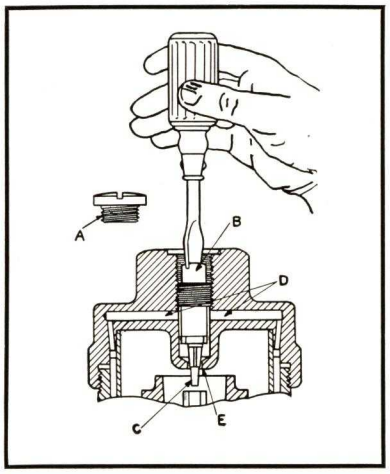
REGULATION OF Watrous FLUSH VALVES

MAJESTIC



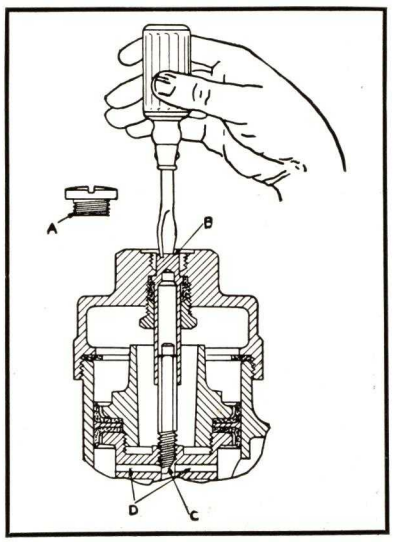
This sectional view clearly illustrates the scientific method of regulation and the self-cleansing by-pass features of the MAJESTIC Flush Valve. Note that adjustment of the length of flush is accomplished easily by the turn of a screw without shutting off the water or taking the valve apart. METHOD OF ADJUSTMENT is to remove cap nut "A" exposing adjusting screw "B." Screwing "B" in or out reduces or increases the opening between the plunger "C" and the seat "E," making possible adjustment for the correct flush of the particular fixture used. SELF-CLEANSING FEATURE—The plunger "C" is raised up off of seat "E" by the diaphragm operating unit each time the valve is flushed, making the seat self-cleansing. Also note the port "D" is many times larger than the average by-pass port, assuring positive protection against clogging.

IMPERIAL



The view at the left illustrates the ease of adjustment and the self-cleansing features of the IMPERIAL Flush Valve and shows how this valve assures water economy with any fixture. The length of flush can be easily regulated for any type of fixture without shutting off the water or taking the valve apart. METHOD OF ADJUSTMENT is to remove cap nut "A" exposing adjusting screw "B" which, when screwed in or out reduces or increases the opening between plunger "C" and the seat "E," thus accurately controlling the length of flush for maximum efficiency on the particular fixture used. SELF-CLEANSING FEATURE — The plunger "C" is raised up off of seat "E" by the piston unit each time the valve is flushed, thus making the seat self-cleansing. Note also that ports "D" are many times larger than the average by-pass port, thus protecting against clogging.

JEWEL



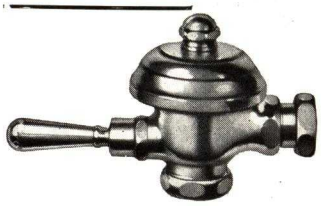
The sectional view illustrates the scientific method of regulation and the double by-pass channel of the JEWEL valve. Note that the length of flush can be accurately adjusted for any type of fixture by removing the cap nut "A" and turning the adjusting screw "B."

Screwing "B" in lengthens the flush, while screwing it out shortens the flush. This adjustment permits the valve to be used on any type of fixture, providing quick regulation to the minimum requirements of the fixture.

The double by-pass channel "D" is of good size and is thoroughly cleansed by the water stream each time the valve is flushed, thus insuring against clogging by scale or foreign matter in the water.

TYPE VARIATIONS OF Watrous FLUSH VALVES

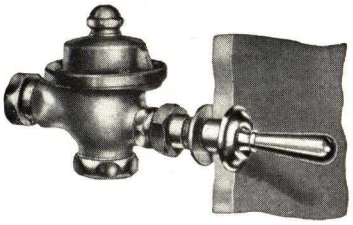
MAJESTIC



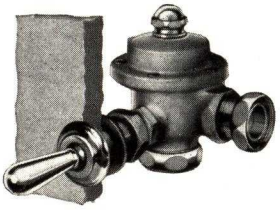
No. M-525
For exposed installation with inlet opposite handle

No. M-526
For exposed installation with inlet to right of handle

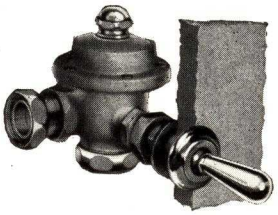
No. M-527
For exposed installation with inlet to left of handle



No. M-528 for concealed installation with inlet opposite handle

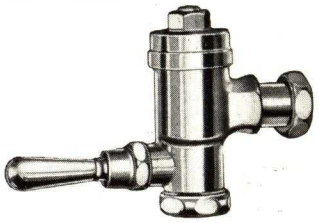


No. M-529 for concealed installation with inlet to right of handle



No. M-530 for concealed installation with inlet to left of handle

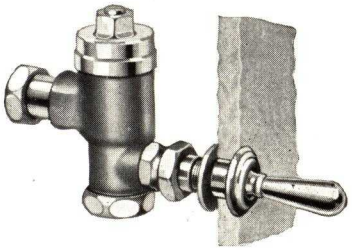
IMPERIAL



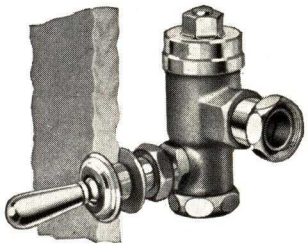
No. M-625
For exposed installation with inlet opposite handle

No. M-626
For exposed installation with with inlet to right of handle

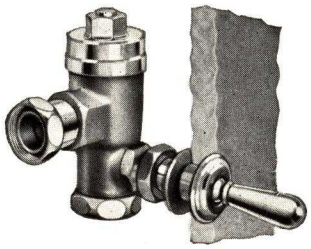
No. M-627
For exposed installation with inlet to left of handle



No. M-628 for concealed installation with inlet opposite handle



No. M-629 for concealed installation with inlet to right of handle

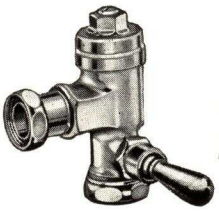


No. M-630 for concealed installation with inlet to left of handle

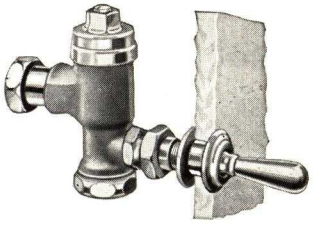
JEWEL

No. M-925
For exposed installation with inlet opposite handle

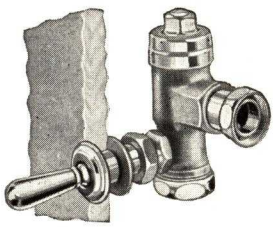
No. M-926
For exposed installation with inlet to right of handle



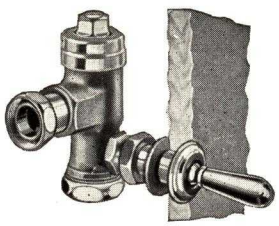
No. M-927
For exposed installation with inlet to left of handle



No. M-928 for concealed installation with inlet opposite handle

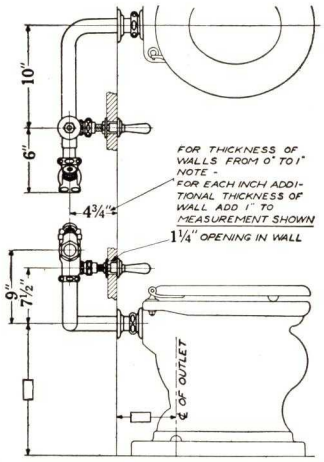


No. M-929 for concealed installation with inlet to right of handle



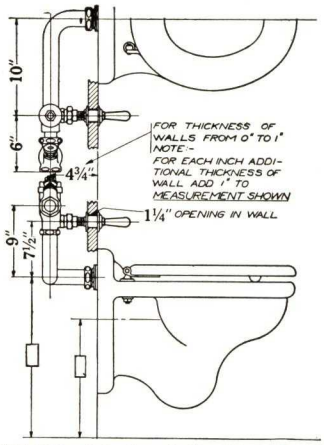
No. M-930 for concealed installation with inlet to left of handle

Watrous FLUSH VALVE COMBINATIONS



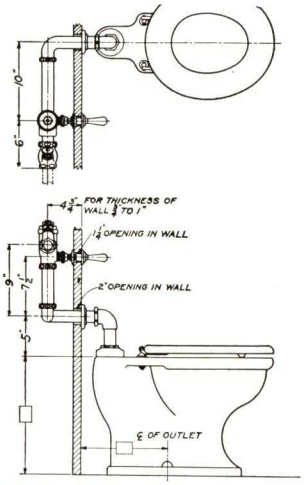
MAJESTIC Combination { **Left Inlet No. M-536** / **Right Inlet No. M-536½** }
IMPERIAL Combination { **Left Inlet No. M-636** / **Right Inlet No. M-636½** }
JEWEL Combination { **Left Inlet No. M-936** / **Right Inlet No. M-936½** }

Above combination consists of: Rough Flush Valve, inlet to left (or to right) of metal handle* (see note), rough 1" wheel handle straight shut-off, double elbow flush connection, wall flange, spud nut and flange, for 1½" rear spud floor bowl.



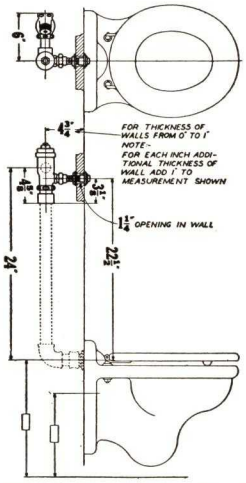
MAJESTIC Combination { **Left Inlet No. M-539** / **Right Inlet No. M-539½** }
IMPERIAL Combination { **Left Inlet No. M-639** / **Right Inlet No. M-639½** }
JEWEL Combination { **Left Inlet No. M-939** / **Right Inlet No. M-939½** }

Above combination consists of: Rough Flush Valve, inlet to left (or to right) of metal handle* (see note), rough 1" wheel handle straight shut-off, double elbow flush connection, spud nut, for 1½" rear spud wall bowl.



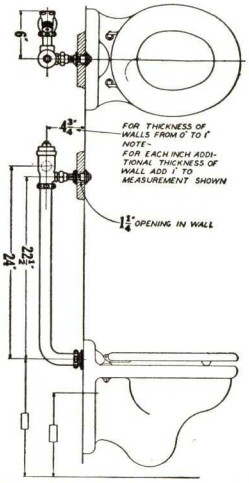
MAJESTIC Combination { **Left Inlet No. M-562** / **Right Inlet No. M-562½** }
IMPERIAL Combination { **Left Inlet No. M-662** / **Right Inlet No. M-662½** }
JEWEL Combination { **Left Inlet No. M-962** / **Right Inlet No. M-962½** }

Above combination consists of: Rough Flush Valve, inlet to left (or to right) of metal handle* (see note), rough 1" wheel handle straight shut-off, wall flange, triple elbow flush connection with exposed portions nickel plated, spud nut and flange, for 1½" top spud bowl.



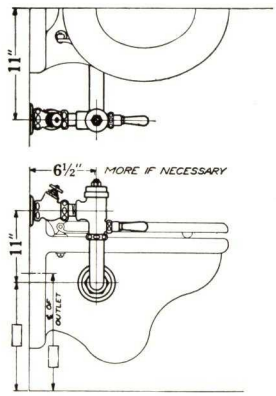
MAJESTIC Combination { **Right Inlet No. M-547** / **Left Inlet No. M-547½** }
IMPERIAL Combination { **Right Inlet No. M-647** / **Left Inlet No. M-647½** }
JEWEL Combination { **Right Inlet No. M-947** / **Left Inlet No. M-947½** }

Above combination consists of: Rough Flush Valve, with inlet to right (or to left) of push button* (see note), rough 1" wheel handle straight shut-off, 1¼" female I.P. union outlet (no flush connection). For rear spud wall or floor bowls.



MAJESTIC Combination { **Right Inlet No. M-548** / **Left Inlet No. M-548½** }
IMPERIAL Combination { **Right Inlet No. M-648** / **Left Inlet No. M-648½** }
JEWEL Combination { **Right Inlet No. M-948** / **Left Inlet No. M-948½** }

Above combination consists of: Rough Flush Valve, with inlet to right (or to left) of push button* (see note), rough 1" wheel handle straight shut-off, rough elbow flush connection and spud nut, for 1½" rear spud wall or floor bowl.



MAJESTIC Combination No. M-538
IMPERIAL Combination No. M-638
JEWEL Combination No. M-938

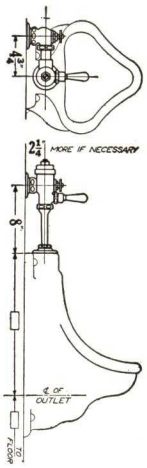
Above combination consists of: Nickel Plated Flush Valve, with inlet opposite metal handle, 1" loose-key straight shut-off, wall flange, elbow flush connection, spud nut and flange, for 1½" side spud wall bowl.

VARIATIONS

W	With Bumper for seat with cover	Extra, See Price Sheet
A	With M-22 Twin bar bumper for open front seat less cover	Extra, See Price Sheet
T	With M-16 Long wall bumper for closed front seat with or without cover	Extra, See Price Sheet
R	With 2"x1½" spud reducer	Extra, See Price Sheet
O	Metal handle now standard equipment	No Extra
U	With loose key instead of wheel handle shut-off	No Extra
S	With 1¼" Flush connection instead of 1½"	No Extra

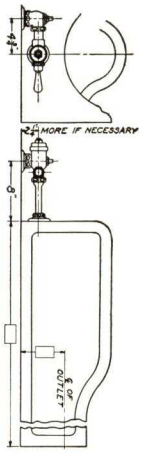
***NOTE No. 2**—*For concealed valves: Be sure and state wall thickness.*
Measurement from center of spud to center of handle APPROXIMATE. (Detailed print furnished on request.)

Watrous FLUSH VALVE COMBINATIONS



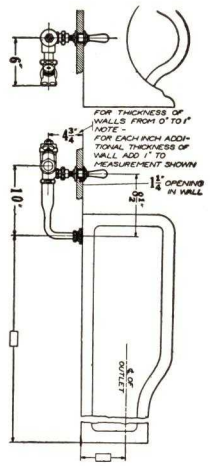
MAJESTIC Combination No. M-542
IMPERIAL Combination No. M-642
JEWEL Combination No. M-942

Above combination consists of: Nickel Plated Flush Valve, with inlet to right of metal handle, ¾" loose-key angle shut-off, wall flange, straight flush connection, spud nut and flange, for ¾" top spud wall hung urinal.



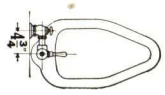
MAJESTIC Combination No. M-549
IMPERIAL Combination No. M-649
JEWEL Combination No. M-949

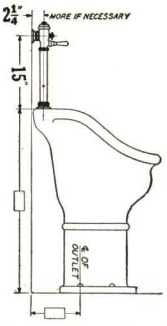
Above combination consists of: Nickel Plated Flush Valve, with inlet opposite metal handle, ¾" loose-key angle shut off, wall flange, straight flush connection, spud nut and flange, for ¾" top spud stall urinal.



MAJESTIC Combination { **Left Inlet No. M-541** / **Right Inlet No. M-541½**
IMPERIAL Combination { **Left Inlet No. M-641** / **Right Inlet No. M-641½**
JEWEL Combination { **Left Inlet No. M-941** / **Right Inlet No. M-941½**

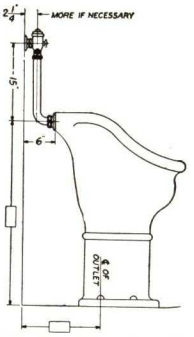
Above combination consists of: Rough Flush Valve, with inlet to left (or to right) of metal handle* (see note), rough ¾" wheel handle straight shut-off, elbow flush connection, spud nut, for ¾" rear spud stall urinal.





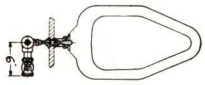
MAJESTIC Combination No. M-543
IMPERIAL Combination No. M-643
JEWEL Combination No. M-943

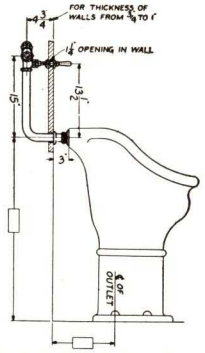
Above combination consists of: Nickel Plated Flush Valve, with inlet to right of metal handle, 1" loose-key angle shut-off, wall flange, straight flush connection, spud nut and flange, for 1½" top spud pedestal urinal.



MAJESTIC Combination No. M-559
IMPERIAL Combination No. M-659
JEWEL Combination No. M-959

Above combination consists of: Nickel Plated Flush Valve, with inlet opposite metal handle, 1" loose-key angle shut-off, wall flange, elbow flush connection, spud nut and flange, for 1½" rear spud pedestal urinal.





MAJESTIC Combination { **Left Inlet No. M-560** / **Right Inlet No. M-560½**
IMPERIAL Combination { **Left Inlet No. M-660** / **Right Inlet No. M-660½**
JEWEL Combination { **Left Inlet No. M-960** / **Right Inlet No. M-960½**

Above combination consists of: Rough Flush Valve, with inlet to left (or to right) of metal handle* (see note) rough 1" wheel handle straight shut-off, elbow flush connection, wall flange, spud nut and flange, for 1½" rear spud pedestal urinal.

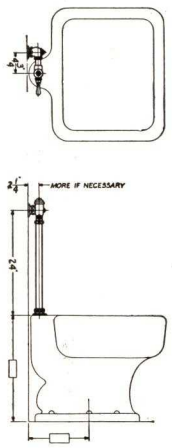
VARIATIONS

W A T R O U S

With solid metal push button instead of metal lever handle . . . . . No Extra
With ½" Shut-off instead of ¾" . . . . . No Extra
With 1" Flush connection instead of ¾" . . . . . No Extra
With ½" Flush connection instead of ¾" . . . . . No Extra
Metal handle now standard equipment . . . . . No Extra
With loose key instead of wheel handle shut-off . . . . . No Extra
With 1¼" Flush connection instead of 1½" . . . . . No Extra

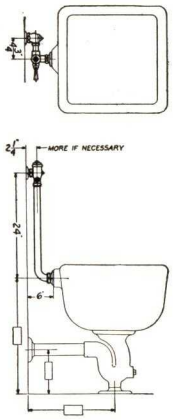
***NOTE No. 2**—*For concealed valves: Be sure and state wall thickness.*
Measurement from center of spud to center of handle APPROXIMATE. (Detailed print furnished on request.)

Watrous FLUSH VALVE COMBINATIONS



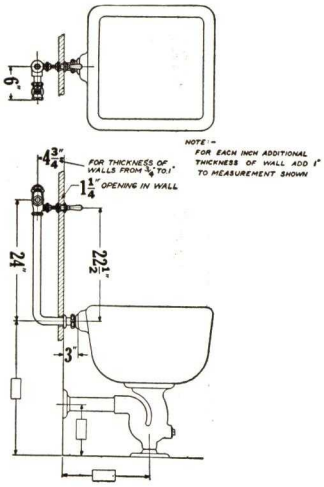
MAJESTIC Combination No. M-555
IMPERIAL Combination No. M-655
JEWEL Combination No. M-955

Above combination consists of: Nickel Plated Flush Valve, with inlet opposite metal handle, 1″ loose-key angle shut-off, wall flange, straight flush connection, spud nut and flange, for 1½″ top spud slop sink.



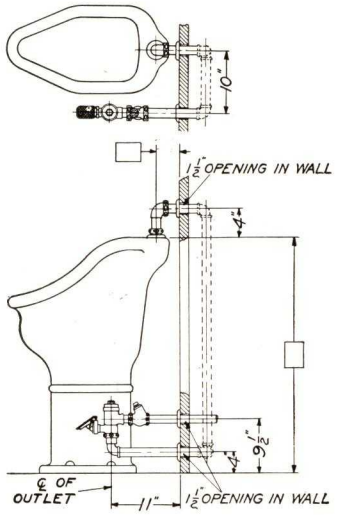
MAJESTIC Combination No. M-558
IMPERIAL Combination No. M-658
JEWEL Combination No. M-958

Above combination consists of: Nickel Plated Flush Valve, with inlet opposite metal handle, 1″ loose-key angle shut-off, wall flange, elbow flush connection, spud nut and flange, for 1½″ rear spud slop sink.



MAJESTIC Combination { **Left Inlet No. M-545** / **Right Inlet No. M-545½**
IMPERIAL Combination { **Left Inlet No. M-645** / **Right Inlet No. M-645½**
JEWEL Combination { **Left Inlet No. M-945** / **Right Inlet No. M-945½**

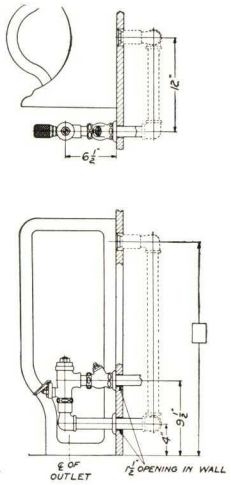
Above combination consists of: Rough Flush Valve, inlet to left (or to right) of metal handle* (see note), rough 1″ wheel handle straight shut-off, elbow flush connection, wall flange, spud nut and flange for 1½″ rear spud slop sink.



MAJESTIC Combination No. M-576
IMPERIAL Combination No. M-676

Above combination consists of: Nickel Plated Foot Pedal Flush Valve, with inlet opposite pedal, 1″ loose-key straight shut-off, female I.P. union outlet, wall flanges, elbow flush connection from wall to spud, iron pipe casing from valve to wall, spud nut and flange, for 1½″ top spud pedestal urnial.

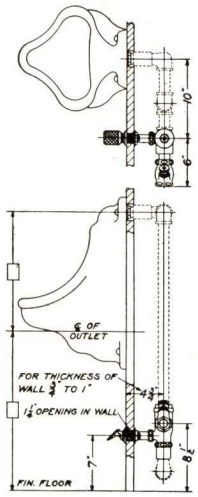
NOTE: *No concealed piping furnished.*



MAJESTIC Combination No. M-577
MAJESTIC Combination No. M-677

Above combination consists of: Nickel Plated Foot Pedal Flush Valve, with inlet opposite pedal, ¾″ loose-key straight shut-off, female I.P. union outlet, wall flanges, iron pipe casing from valve to wall, for ¾″ rear spud stall urinal.

NOTE: *No concealed piping furnished.*



MAJESTIC Combination No. M-578
IMPERIAL Combination No. M-678

Above combination consists of: Rough Foot Pedal Flush Valve, with inlet to right of pedal (see note), rough ¾″ wheel handle straight (or angle if required) shut-off, female I.P. union outlet, (no flush connection furnished) for ¾″ rear spud wall hung urinal.

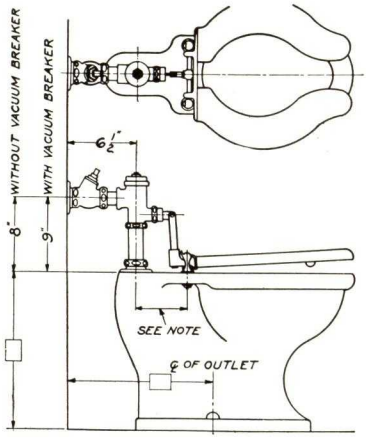
NOTE: *No concealed piping furnished.*

VARIATIONS

W	With solid metal push button instead of metal lever handle	No Extra
A	With ½″ Shut-off instead of ¾″	No Extra
T	With 1″ Flush connection instead of ¾″	No Extra
R	With ½″ Flush connection instead of ¾″	No Extra
O	Metal handle now standard equipment	No Extra
U	With loose key instead of wheel handle shut-off	No Extra
S	With 1¼″ Flush connection instead of 1½″	No Extra

***NOTE No. 2**—*For concealed valves: Be sure and state wall thickness.*
Measurement from center of spud to center of handle APPROXIMATE. (Detailed print furnished on request.)

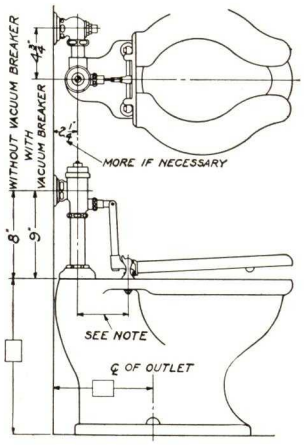
Watrous SEAT ACTION FLUSH VALVE COMBINATIONS



MAJESTIC Combination No. M-581
IMPERIAL Combination No. M-681

Above combination consists of: Nickel Plated Seat Operated Flush Valve, with inlet to rear, 1" loose-key straight shut-off, wall flange, spud nut and flange, straight flush connection for 1½" top spud bowl, adjustable bar check hinge and open front and back composition seat for regular round front bowl.

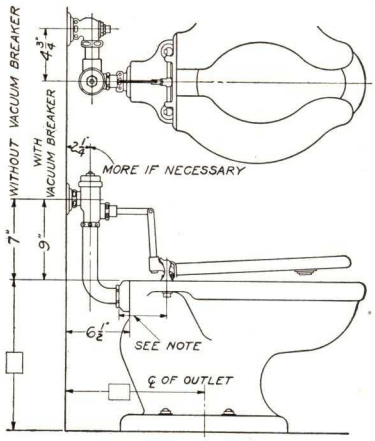
NOTE: *Be sure to specify distance from center of spud to center of post holes.*



MAJESTIC Combination No. M-582
IMPERIAL Combination No. M-682

Above combination consists of: Nickel Plated Seat Operated Flush Valve, with inlet to right, 1" loose-key angle shut-off, wall flange, spud nut and flange, straight flush connection for 1½" top spud bowl, adjustable bar check hinge and open front and back composition seat for regular round front bowl.

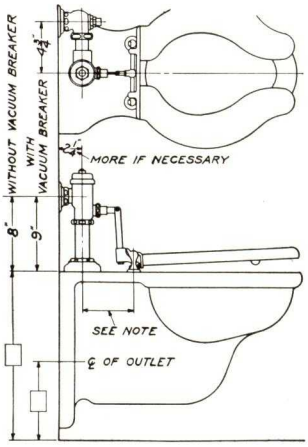
NOTE: *Be sure to specify distance from center of spud to center of post holes.*



MAJESTIC Combination No. M-583
IMPERIAL Combination No. M-683

Above combination consists of: Nickel Plated Seat Operated Flush Valve, with inlet to right, 1" loose-key angle shut-off, wall flange, spud nut and flange, elbow flush connection for 1½" rear spud bowl, adjustable bar check hinge and open front and back composition seat for regular round front bowl.

NOTE: *Be sure to specify distance from face of spud to center of post holes.*

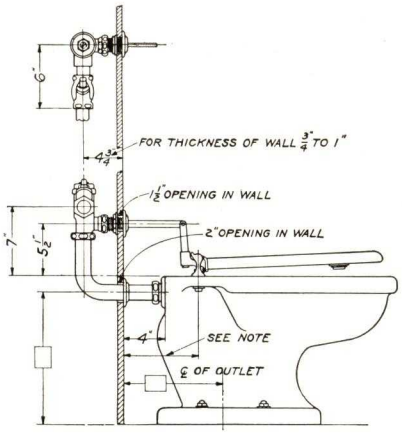


MAJESTIC Combination No. M-587

IMPERIAL Combination No. M-687

Above combination consists of: Nickel Plated Seat Operated Flush Valve, with inlet to right, 1" loose-key angle shut-off, wall flange, spud nut and flange, straight flush connection for 1½" top spud wall bowl, adjustable bar check hinge and open front and back composition seat for regular round front bowl.

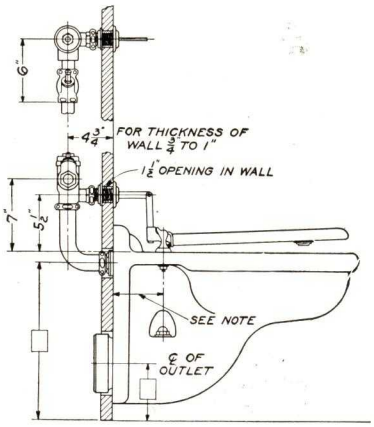
NOTE: *Be sure to specify distance from center of spud to center of post holes.*



MAJESTIC Combination { **Left Inlet No. M-586** / **Right Inlet No. M-586½**
IMPERIAL Combination { **Left Inlet No. M-686** / **Right Inlet No. M-686½**

Above combination consists of: Rough Flush Valve, with inlet to left (or to right), (see note No. 2), rough 1" wheel handle straight shut-off, wall flange, spud nut and flange, elbow flush connection for 1½" rear spud floor bowl, adjustable bar check hinge and open front and back composition seat for regular round front bowl.

NOTE: *Be sure to specify distance from finished wall to center of post holes.*



MAJESTIC Combination { **Left Inlet No. M-589** / **Right Inlet No. M-589½**
IMPERIAL Combination { **Left Inlet No. M-689** / **Right Inlet No. M-689½**

Above combination consists of: Rough Flush Valve, with inlet to left (or to right), (see note No. 2), rough 1" wheel handle straight shut-off, spud nut, elbow flush connection for 1½" rear spud wall bowl, adjustable bar check hinge and open front and back composition seat for regular round front bowl.

NOTE: *Be sure to specify distance from finished wall to center of post holes.*

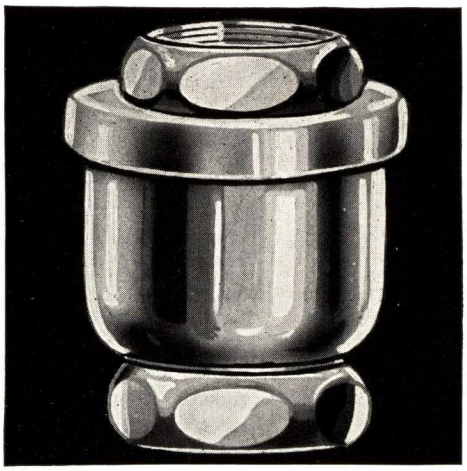
VARIATIONS

W	With open front and back seat for extended lip bowl	No Extra
A	With open front and back seat for elongated bowl	No Extra
T	With open front and closed back seat for regular round bowl	No Extra
R	With 2" x 1½" spud reducer	Extra, See Price Sheet
O	With 2" x 1¼ spud reducer	Extra, See Price Sheet
U	With loose-key instead of wheel handle shut-off	No Extra
S	With 1¼" flush connection instead of 1½"	No Extra

***NOTE No. 2**—*For concealed valves: Be sure and state wall thickness.*
Measurement from center of spud to center of handle APPROXIMATE. (Detailed print furnished on request.)

IMPERIAL VACUUM BREAKER

Provides Positive Protection Against Back-Syphonage



Imperial M-1111 Vacuum Breaker

The above illustration shows the Imperial M-1111 Vacuum Breaker installed with the Watrous Imperial Flush Valve. This vacuum breaker is equally adaptable for installation with the Watrous Majestic and Watrous Jewel Flush Valves, as well as all other makes of flush valves—on old or new installations.

The Imperial Vacuum Breaker, illustrated at left, incorporates features which makes it outstanding in prevention of back-syphonage. These features include:

FULL AREA

The Imperial Vacuum Breaker provides a full 1 in. atmospheric opening into the flush connection between the flush valve and the fixture, definitely preventing the forming of any vacuum, the cause of back-syphonage.

DEPENDABLE

Construction throughout of the higest grade materials, brass and bronze, with vital parts of monel metal, makes breaker immune to corrosion or sticking and assures operation each time the valve is actuated. Atmospheric openings are specially protected against stoppage or malicious tampering.

SILENT

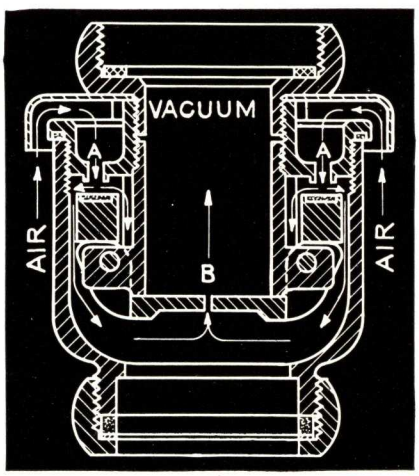
The atmospheric openings are closed each time the valve flushes, thus assuring against any leakage or spitting and eliminating all objectionable water and air noises.

UNRESTRICTED

With a large, full opening, the Imperial Vacuum Breaker assures unrestricted flow of water when the valve is flushing, providing a full volume of water to the fixture even under low water pressure conditions.

PLEASING DESIGN

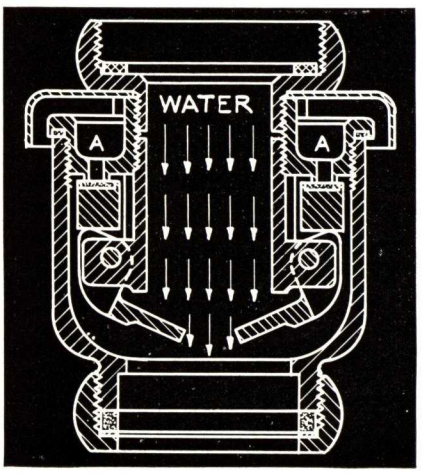
The Imperial Vacuum Breaker, attached to the outlet of the flush valve, forms a compact and symmetrical design eliminating the usual protrusions or bulges of the average type of vacuum breaker and harmonizing with the combination as a whole.



The sectional views to the left and right show the operation of the Imperial M-1111 Vacuum Breaker.

The illustration to the left shows it in the protective position, with the flush valve closed, allowing free entry of the air through the atmospheric openings.

The illustration to the right shows it in the operating or flushing position, with the atmospheric openings closed and water flowing through to the fixture.

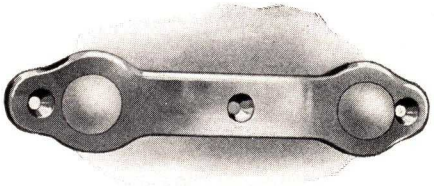


Watrous CLOSET SEAT BUMPERS

Furnished in Nickel Plated or Chromium Plated Finish

No. M-13 Seat Bumper
For attaching to top of MAJESTIC Flush Valve.

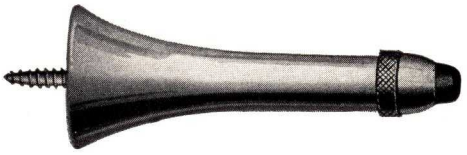
No. M-15 Seat Bumper (Short)
Length 1 ¼". Toggle Bolt can be furnished instead of Wood Screw without additional cost.



No. M-22 Twin Bar Bumper
Center to center of bumpers, 5 ¼".

No. M-243 Seat Bumper
For attaching to top of IMPERIAL and JEWEL Flush Valves.

No. M-38 Seat Bumper
For attaching to Angle Shut-off. Hole in rubber permits use of Loose Key without removing bumper.



No. M-16 Seat Bumper (Long)
Length, 4". Toggle Bolt can be furnished instead of Wood Screw without additional cost.

SYPHON PREVENTING SHUT-OFFS

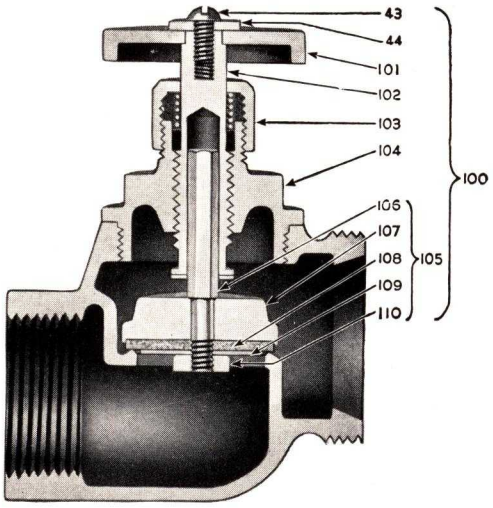
For Majestic, Imperial and Jewel Flush Valves

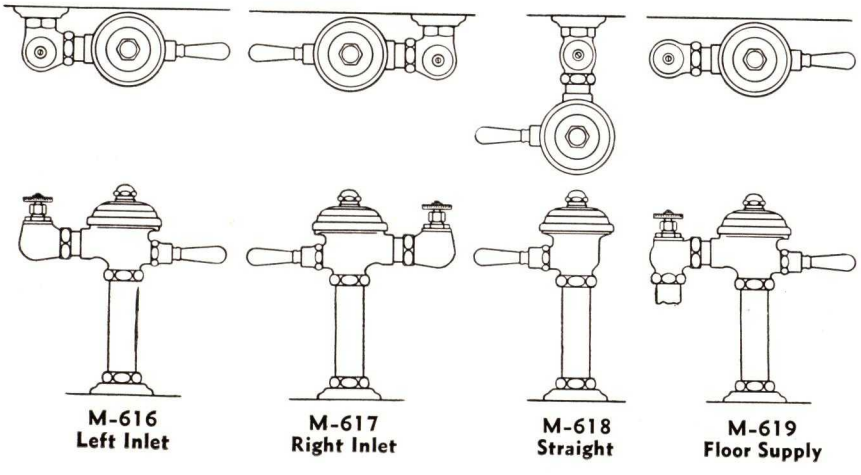
These Shut-offs are so arranged that they remain in a closed position at all times except when the flush valve is operating. If a vacuum occurs in the supply line the Shut-off does not permit water to be drawn through the valve from the bowl or other fixture and remains in a closed position until pressure is restored in the line and the flush valve is operated again.

Special care should be taken in ordering the correct angle type Shut-offs, as the three different types are not interchangeable. From the illustrations at the bottom of the page it can be noted that the three angle types are for installation as follows: M-616 for installation where supply is to left of flush valve; M-617 for installation where supply is to right of flush valve; M-619 for installation where supply is from floor. The straight type is installed in the regular way.

Care should also be taken when installing this type of Shut-off so that the operating mechanism is in an upright position to assure proper operation of unit.

They are furnished in the following variations: 1" Iron Pipe Size Inlet; Rough, Nickel Plate or Chromium Plate Finish; Wheel Handle or Loose Key.





M-616 Left Inlet | **M-617 Right Inlet** | **M-618 Straight** | **M-619 Floor Supply**

Repair part numbers for M-616, M-617, M-618 and M-619 Watrous Syphon Preventor Shut-Off Valves.

No.	Description	List
43	Handle Screw	$0.04
44	Brass Handle Washer	.04
100	Shut-Off Stem Assembly Complete	2.40
101	Wheel Handle	.20
102	Shut-Off Stem Only	.40
103	Packing Nut	.18
104	Bonnet	.50
105	Seat Assembly	.52
106	Stem	.20
107	Weight	.20
108	Seat Washer	.04
109	Brass Washer	.04
110	Nut	.04

THE IMPERIAL BRASS MFG. CO.

1200 W. Harrison Street
CHICAGO, ILLINOIS

●

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ESTABLISHED 1893

BENEKE CORPORATION

Makers of Toilet Seats, Plumbers' Woodwork and Plumbers' Brass

21st and Rockwell Streets, CHICAGO, ILL.

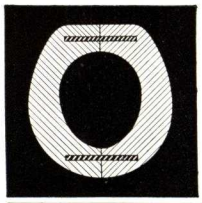
REPRESENTATIVES IN ALL PRINCIPAL CITIES

ROCKWELL QUALITY TOILET SEATS

For Residential, Industrial, Commercial, Marine, Air and Rail Travel Installations

BENEKE CORPORATION, manufacturers of "ROCKWELL" Products since 1893, has established its identity in the industry with its large modern plant, as makers of the famous "ROCKWELL" Quality Toilet Seat. We offer to the trade the most complete line of wood toilet seats available. The construction of "ROCKWELL" Seats includes their manufacture from the raw materials to a finished product. Having controlled supervision, there is no variation in quality and precision. Skilled workmen with many years' experience have assisted in establishing the reputation of the "ROCKWELL" line. Constant constructive and progressive improvements place our products before the public as the outstanding achievement in the quality field.

"ROCKWELL" Toilet Seats are made in oval, elongated, extended lip shapes and in all sizes, styles and colors for any requirement. Special designs, specifications, and colors made on request.



Reinforced Dowel Construction

Closed front toilet seats are reinforced with concealed spiral grooved hickory dowels forced into wood, cross grain, with waterproof glue, at both front and back of seat, giving added strength and making them practically split-proof. Open front toilet seats are doubly reinforced at back of seat with two concealed spiral grooved hickory dowels.

No. 830—The Biltmore for Elongated Bowl

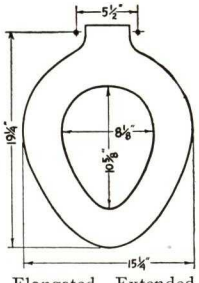
No. 630—The Bancroft for Oval Bowl

Features and Designs

"ROCKWELL" Toilet Seats are manufactured in three standard designs, each created for a specific style of toilet bowl, known as Regular Oval, Elongated, and Extended Lip Bowl. Special toilet seats to conform with the contour of special bowls require a blueprint or template for estimating and manufacturing purposes.

Lumber

Wood used in the manufacture of "ROCKWELL" Toilet Seats is select No. 1 Northern Birch and White Oak weather-seasoned and scientifically kiln dried in our own modern kilns to an approximate 3½% moisture content. To prevent warpage, all toilet seats are made of four or more pieces of lumber.



Elongated—Extended Back
Closed front design

Lap Joint Sheet Covered Seams

The "ROCKWELL" method of joining Beneloid sheet covering is considered to be the strongest way of making a smooth invisible seam that will not split or open at the edges. The vulcanized featheredged lap joint application is illustrated herewith.

Varnished Finish

Birch Mahogany finish on "ROCKWELL" Toilet Seats includes the application of oil or water stain, one coat of orange shellac, hand sanded, and one coat of best quality waterproof varnish, hand rubbed and dull polished giving a smooth satin appearance.

Beneloid Sheet Covered Finish

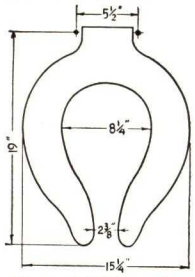
Beneloid sheet covered finish is a heavy gauge nitro-cellulose sheet applied by a specially developed process. It is available in snow-white, standard "ROCKWELL" opaque and sea pearl colors. Special colors upon request.

Beneloid Seamless Finish

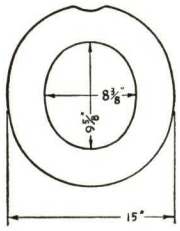
Beneloid seamless finish is a specially prepared nitro-cellulose formula. It is not an enamel and will not discolor, crack, peel or craze. Leaves no seams or joints and has a smooth gloss surface.

Closed Front Saddle Seat for Oval Bowl

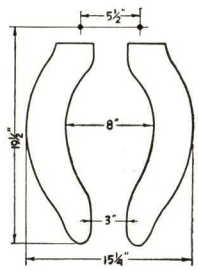
Child Seat to Fit in Oval Full Size Seat



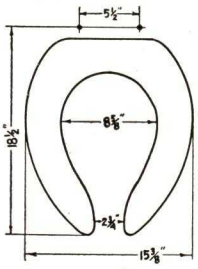
Extended Lip—Extended Back
Open front design



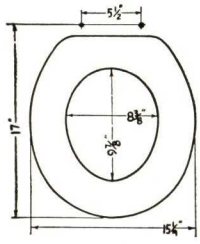
Hopper—Round Back
Closed front design



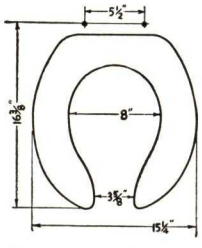
Extended Lip—Straight Back
Open front and back design



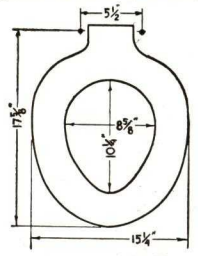
Elongated—Straight Back
Open front design



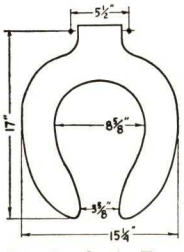
Regular Oval—Straight Back
Closed front design



Regular Oval—Straight Back
Open front design



Regular Oval—Extended Back
Closed front design



Regular Oval—Extended Back
Open front design

THE BRUNSWICK-BALKE-COLLENDER CO.

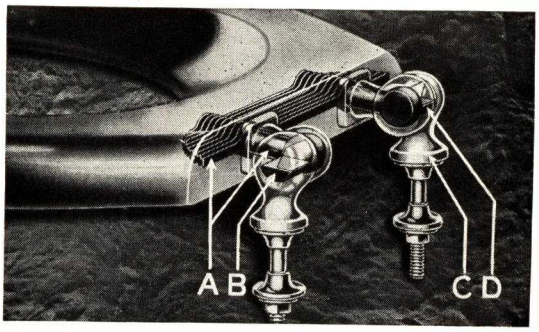
TELEPHONE
Wabash 4020

GENERAL OFFICE
623-633 South Wabash Avenue
CHICAGO, ILL.

ESTABLISHED 1845

REPRESENTATIVES IN ALL PRINCIPAL CITIES

BRUNSWICK WHALE-BONE-ITE SEATS WITH INTEGRAL MOULDED HINGES



Hinge Construction Open Front and Closed Back Seats

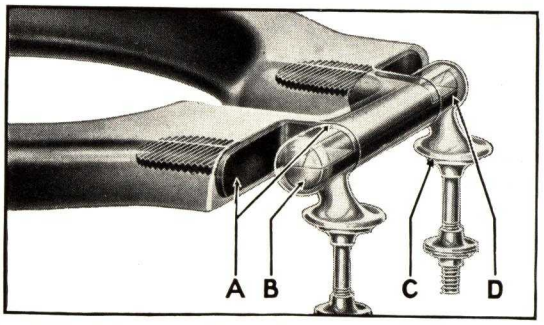
Hinge Construction

A—Heavy metal corrugated hinge plate and post lugs in one piece embedded in laminated core of seat.

B—Metal post bearing, an integral part of hinge plate.

C—Heavy metal post insert and check lug.

D—Covering of Whale - Bone - Ite over hinge plate, posts, inserts and seat—one solidified unit.



Hinge Construction Open Front and Open Back Seats

Sanitation — strength — beauty in closet seats is achieved in this Whale-Bone-Ite development. The hinge, a heavy metal casting, and seat are covered with Whale-Bone-Ite and moulded in one operation under hydraulic pressure producing one solidified unit. No unsanitary crevices—nothing to work loose—impervious to moisture—noncorrosive—unbreakable—it answers all hinge problems, and assures lasting service.

It is a well-known fact that public toilet seats receive constant, careless slam-bang abuse from the public. But, the public cannot smash Whale-Bone-Ite. Its unbreakable laminated construction—guaranteed for the life of the building—immediately ends all replacement expense. Specify the Whale-Bone-Ite for 100% seat satisfaction.

No. 22½-968—For Elongated Bowls
Open front, closed back seat, no cover, with internal check, and integral moulded hinge.
No. 22½-98—Same, without check

No. 23-968—For Regular Bowls
Open front, closed back seat, no cover, with internal check and integral moulded hinge.
No. 23-98—Same, without check

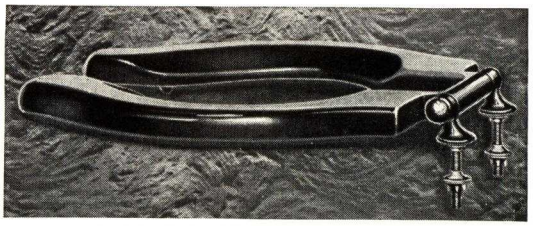
No. 21-968—For Extended Lip Bowls
Open front, closed back seat, no cover, with internal check and integral moulded hinge.
No. 21-98—Same, except without check

Sanitation

Strength

Beauty in Closet Seats

Complete Catalogue on Request



No. 18-568—For Extended Lip Bowls
Open front and back Whale-Bone-Ite seat, no cover, with internal check and integral moulded hinge.
No. 18-58—Same, except without check

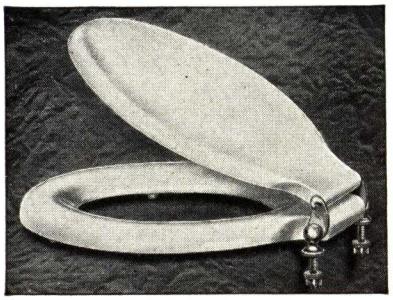
No. 182-568—For Elongated Bowls
Open front and back Whale-Bone-Ite seat, no cover, with internal check and integral moulded hinge.
No. 182-58—Same, without check

No. 18½-568—For Regular Bowls
Open front and back Whale-Bone-Ite seat, no cover, with internal check and integral moulded hinge.
No. 18½-58—Same, without check

BRUNSWICK WHITE AND COLORED SEATS

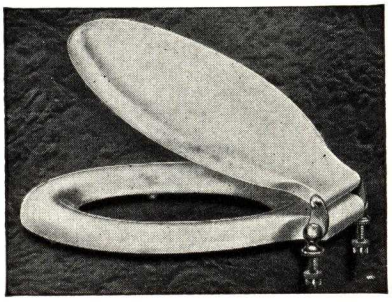
For more than 92 years, Brunswick has had fair dealings with the American public. The DuPont covering on the Brunswick White and Colored Seats, coupled with Brunswick skill in woodcraft, is our guarantee of workmanship and quality. All Brunswick *Pyralin* Covered Seats can be furnished in plain or sea pearl colors, guaranteed not to crack, chip, craze or discolor. There is a Brunswick seat for every type of bowl. The complete Brunswick Seat catalog in color will be sent to you upon request.

BRUNSWICK PYRALIN COVERED SEATS



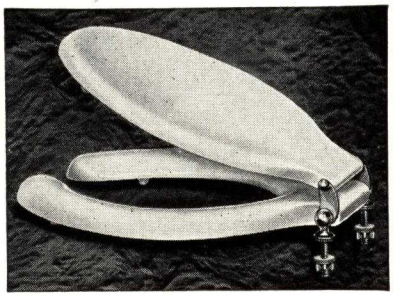
No. 300—Closed Front, Extended Back for Regular Bowl

No. 300—Seat with cover, no check
No. 301—Seat without cover, no check
No. 302—Seat without cover, with check



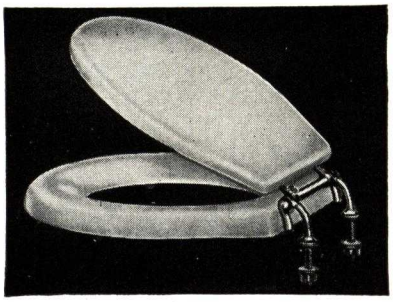
No. 306—Closed Front, Extended Back for Elongated Bowl

No. 306—Seat with cover, no check
No. 307—Seat without cover, no check
No. 308—Seat without cover, with check



No. 353—Open Front, Extended Back for Elongated Bowl

No. 353—Seat with cover, no check
No. 354—Seat without cover, no check
No. 355—Seat without cover, with check

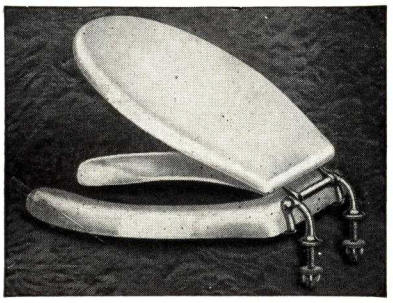


No. 315—Closed Front, for Regular Bowl

No. 315—Seat with cover, no check
No. 316—Seat without cover, no check

No. 318—Closed Front, for Elongated Bowl

No. 318—Seat with cover, no check
No. 319—Seat without cover, no check



No. 390—Open Front, for Regular Bowl

No. 390—Seat with cover, no check
No. 391—Seat without cover, no check

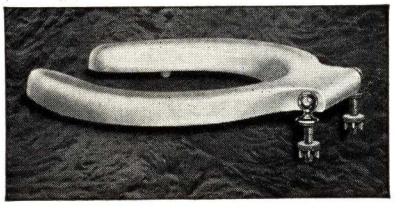
MONARCH PYRALIN COVERED SEATS

No. 800—Closed Front, for Regular Bowl

No. 800—Seat and cover, no check
No. 801—Seat without cover, no check

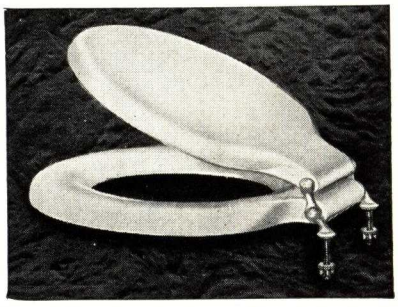
No. 805—Open Front, for Regular Bowl

No. 805—Seat and cover, no check
No. 806—Seat without cover, no check



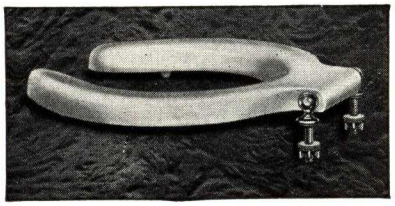
No. 810—Closed Front, for Elongated Bowl

No. 810—Seat and cover, no check
No. 811—Seat without cover, no check



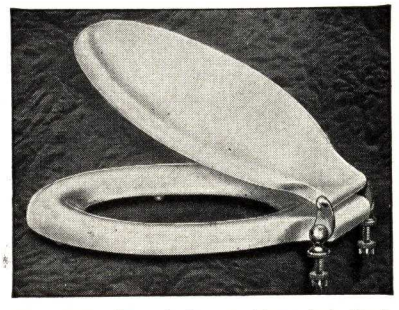
No. 900—Closed Front, Extended Back for Regular Bowl

No. 900—Seat and cover, no check
No. 901—Seat without cover, no check



No. 906—Open Front, Extended Back for Regular Bowl

No. 906—Seat and cover, no check
No. 907—Seat without cover, no check



No. 910—Closed Front, Extended Back for Elongated Bowl

No. 910—Seat and cover, no check
No. 911—Seat without cover, no check

C. F. CHURCH MFG. CO.

DIVISION OF AMERICAN RADIATOR & STANDARD SANITARY CORP.

HOLYOKE, MASS.

DISTRIBUTORS IN EVERY CITY

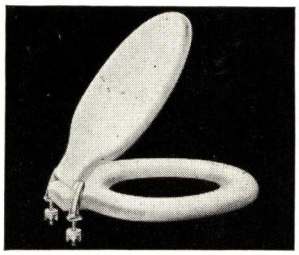
SANI-WHITE, SANI-COLORED, SANI-BLACK TOILET SEATS

For Every Residential, Commercial and Industrial Need

Church Sani-White and Sani-Colored Seats

Church Sani-White Seats consist of a solid kiln dried hardwood core covered all over with a heavy white sheathing, veneered to the core by our special process, with lap-welded joints. The sanitary, strong and durable surface will not crack, craze, chip or flake. Church plain Sani-Colored and Pearl Seats are manufactured by the same process as Sani-White. All colors are guaranteed fast. Hinges, screws, etc., are of the highest quality pure ingot brass, chromium plated and will last indefinitely.

All Church Sani-Seats are available in sizes and colors to match the bowls of different pottery manufacturers. Below are listed a few leading models. Send for complete catalog.



No. 142

Closed Front Seat and Cover for Regular Bowl Sani-White De Luxe Model No. 142

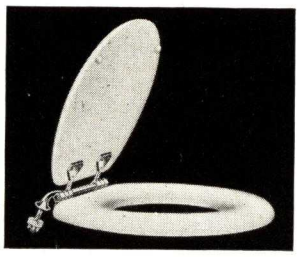
Left:

Equipped with heavy chromium plated brass hinges. No nuts, bolts or screws appear above the surface of the bowl. Sheet covered and made from full 1½-in. stock. Also furnished in complete range of plain and pearl colors.

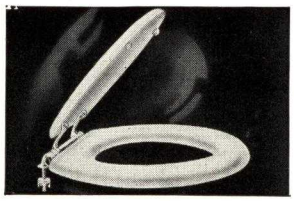
Closed Front Seat and Cover for Regular Bowl Sani-White De Luxe Model No. 425

Right:

Equipped with heavy chromium plated "Mastercraft" brass hinges, sheet covered and made from full 1½-in. stock. Also furnished in complete range of plain and pearl colors



No. 425



No. 600

Closed Front Seat and Cover for Regular Bowl Sani-White Regal Model No. 600

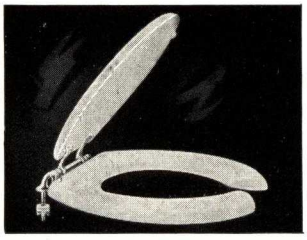
Left:

Equipped with chromium plated cast brass hinges. Sheet covered and made from full 1¼-in. stock. Also furnished in complete range of plain and pearl colors

Open Front Seat and Cover for Regular Bowl Sani-White Regal Model No. 620

Right:

Equipped with chromium plated cast brass hinges. Sheet covered and made from full 1¼-in. stock. Also furnished in complete range of plain and pearl colors



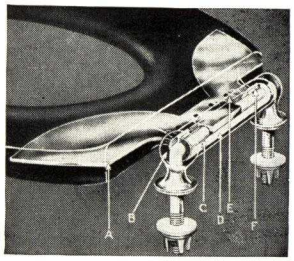
No. 620

Church Sani-Black Seats

These seats are designed for the hard usage encountered in commercial, industrial, public and semipublic buildings. The core is thoroughly kiln dried hardwood. A steel plate anchored in the core houses the axis for hinge rotation.

The whole exterior, core, plate and integral check hinge, is covered with a thick coat of composition hard rubber molded under 216,000 lbs. hydraulic heat pressure. The result is one homogeneous unit—lustrous, attractive, impervious to moisture, acid, heat, cold or corrosion, and incomparably sanitary. The first cost of a Church Sani-Black Seat is the last cost. It will outlast the building without repair or maintenance expense of any sort.

Interested architects are invited to write for a sample cross-section which can be examined and tested at their convenience. Below are listed three popular models. Send for complete catalog.



No. 2300

Closed Front Seat (No Cover) for Regular Bowl Sani-Black Seat Model No. 2300

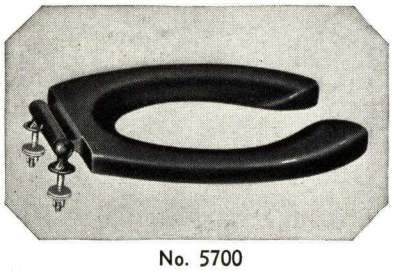
Left:

All black hard rubber composition surface including integrally molded hinge with concealed check

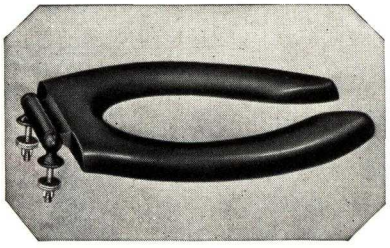
Open Front Seat (No Cover) for Regular Bowl Sani-Black Seat Model No. 5700

Right:

All black hard rubber composition surface including integrally molded hinge with concealed check



No. 5700



No. 2500

Open Front Seat (No Cover) for Elongated or Extended Lip Bowl Sani-Black Seat Model No. 2500

Left:

All black hard rubber composition surface including integrally molded hinge with concealed check

NEVER-SPLIT SEAT COMPANY

Manufacturers of Closet Seats in All Finishes, Constructions and Models

EVANSVILLE, IND., U. S. A.

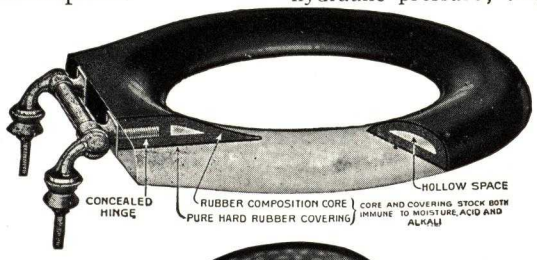
REPRESENTATIVES AND DEALERS IN EVERY LOCALITY

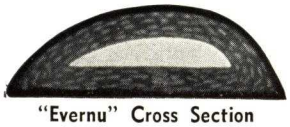
Products

(1) "EVERNU" HARD RUBBER SEATS. (Patented.)
(2) "NEVER-SPLIT" WOOD SEATS. (Patented.)
  (a) White and Colored Sheet Pyralin Covered Seats.
  (b) White and Colored Sprayed Finish Seats.
  (c) Varnished Seats. (All finishes and woods.)
  (d) Special Seats of any description.

Guarantee

"Evernu" Seats are unconditionally guaranteed not to split, break, crack or craze. "Never-Split" hidden screw woodwork is guaranteed unconditionally not to split or come apart at the joints.





"Evernu" Cross Section

"Never-Split" Hidden Screw Construction

"Evernu" Hard Rubber Seats

Construction—"Evernu" Seats are made of pure hard rubber. They are hollow, except across the back where they are made solid and into which solid portion the hinges are attached. The interior wall, made of a special rubber composition, and the exterior wall of pure ebony or mahogany hard rubber are vulcanized together under tremendous hydraulic pressure into one indestructible unit. The hollow center provides lightness and strength. There are no joints to open, no cracks or crevices in the surface.

Finishes—"Evernu" Seats are made either ebony or mahogany in color. There is no finish to wear off or become unsightly, as the finish is simply the hard rubber surface buffed to a lasting luster. Surface can be sterilized and kept sanitary without injuring it in any way. It is impervious to moisture, heat, cold or any destroying elements.

Seats for U. S. Government

"Evernu" and "Never-Split" Seats comply with all U. S. Government specifications covering Hard Rubber and Wood Seats in all finishes—including Master Specifications 448 and WW-P-541.

Catalogue and Construction Sections

Only a few models are shown here. Complete catalogue and construction sections on request.

"Never-Split" Wood Seats

Construction—All "Never-Split" seats are made by our patented hidden screw construction. (See construction cut.) They are held together by heavily threaded steel screws within the wood. The screws absolutely prevent the woodwork from ever splitting or coming apart at the joints. Screws have right and left-hand threads and are embedded into the wood by means of hydraulic pressure; they are entirely invisible, and there are no mortise holes, plugs or fillings in any surface of the woodwork or any outward indication of this unique hidden steel reinforcement.

Finishes—***(A) Sheet Covered***—Extra heavy sheet "pyralin" of the finest quality is used on all "Never-Split" Sheet Covered Seats. Sheeting is applied by a scientific process that completely envelops the woodwork in a seamless, lustrous and durable sheathing. Surface can be easily cleaned and will not chip, crack, craze or discolor. "Never-Split" sheet covered seats are made in pure white, sea pearl colors and plain colors.

(B) Sprayed Seats—"Never-Split" sprayed finish is the highest grade and toughest white or colored sprayed lacquer buffed to a high luster.

(C) Varnished—"Never-Split" oak, mahogany, cherry and walnut finishes are made by carefully filling, staining and shellacking the wood, over which ground coats are applied several coats of highest grade varnish. Final coat can be furnished in gloss finish, dull rubbed or high polish.

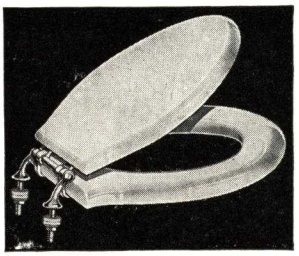
Hinges

"Evernu" and "Never-Split" hinges are made from pure new brass. They are scientifically designed for strength and beauty and are offered in many designs and finishes, including nickel-plated brass, chromium plated, white metal, hard rubber covered and white or colored sprayed finish.

Prices

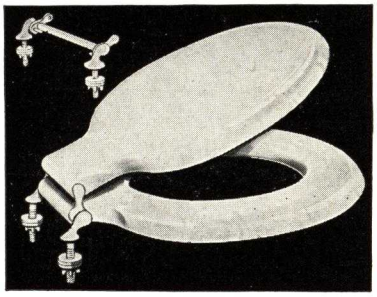
Wholesale plumbing supply dealers and licensed plumbing contractors in every locality can quote prices and give prompt service on "Never-Split" and "Evernu" Seats, which are offered at a wide range of prices for every type of installation.

No. 525-W
"Evernu"



No. 120
"Never-Split"

No. 580
"Evernu"



No. 295-2 "Never-Split"

No. 640
"Evernu"

FLUSH METAL PARTITION CORPORATION

Flush Metal Toilet Stalls, Dressing Room and Shower Compartments, Hospital Cubicles, Flush Metal Doors and Hardware for Marble Toilet Stalls

TELEPHONE
STillwell 4-3380

22-14 40th Avenue, LONG ISLAND CITY, N. Y.

REPRESENTATIVES

ALBANY, N. Y., The Haefner Co., 254 Delaware Avenue—Telephone, Albany 4-8336
BOSTON, MASS., H. W. Mayers, 164 Stuart Street—Telephone, Hubbard 1348
BUFFALO, N. Y., William Clouting Kraetz, 25 East Depew Avenue—Telephone, Parkside 4811
PHILADELPHIA, PA., G. T. Voorhis Co., 220 South 16th Street—Telephone, Pennypacker 6491
POUGHKEEPSIE, N. Y., Hudson Valley Builders' Steel Co., 178 Cottage Street—Telephone, Poughkeepsie 4034
WEST HARTFORD, CONN., R. V. Thomas, 22 Fern-Bel Lane—Telephone, West Hartford 32-1145

For Toilet Partitions and Hardware, see File Index

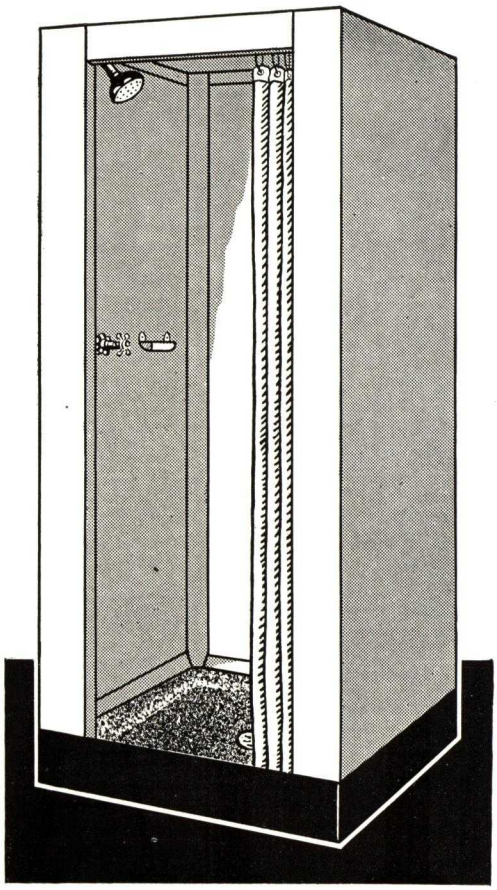
FLUSH METAL SHOWER COMPARTMENTS

CONSTRUCTION

Flush Metal shower compartments are designed to meet every requirement of modern building construction. They are sanitary, leakproof, economical, and are recommended for all types of buildings and homes, new or old. Flush Metal shower compartments are pleasing in appearance and meet with various needs of installation requirements as to size, color scheme, and price.

The Flush Metal shower compartments are made of rustproof steel and so constructed that the back and side walls interlock on a pre-cast receptor, to form a single watertight rigid unit, thus unsightly screws and the use of plastic filling compounds are eliminated.

Flush Metal shower compartments can be installed in battery formation with filler plates for concealing pipes, and can also be furnished with mixing valves, dome light, side sprays, or glass door, chromium plated frame.



Typical Flush Metal Shower Compartment
Left hand drilling shown

Receptors

Flush Metal terrazzo receptors are incased in a rustproof reinforced frame and are cast of the highest grade white waterproof cement with the finest black and white marble chips. This mixture is solidly tamped and puddled to give it the highest waterproof qualities. The receptors are cured, ground, polished and finished to resist slipping.

Flushtex receptors have the same non-slip and watertight qualities as the terrazzo receptors and are cast in a rustproof frame with white and black carborundum chips.

The strainer body is of heavy cast brass with removable brass chrome plated face plate set flush with receptor floor allowing for inside caulking for a 2-in. waste pipe connectoin.

MODELS AND SIZES

Premier 82 in.—Saratoga 82 in.—Niagara 82 in.

Sizes—Width by depth: 30x30, 30x32, 30x36, 32x32, 34x34, 36x36, 36x42, 42x42 in. *Corner shower* 36x36 in. Models listed obtainable in above sizes.

Premier—Walls and top of Armco Iron white vitreous enamel. The terrazzo pre-cast receptor with stainless frame. Chrome plated hot and cold valves, 6-in. centers; adjustable ball joint shower head, soap dish, and curtain rod. Dome light if desired.

Saratoga—Wall and top of 16-gauge rustproof steel, baked-on enamel finish in any standard color. Terrazzo precast receptor with cadmium treated frame. Chrome plated hot and cold valves, 6-in. centers; adjustable ball joint shower head, soap dish and curtain rod. Dome light if desired.

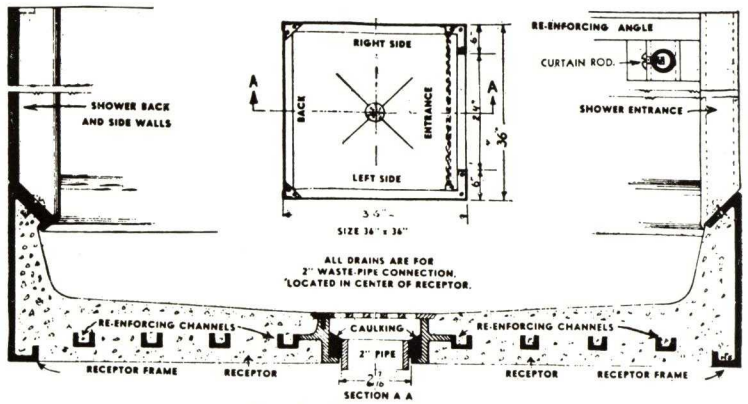
Niagara—Walls of 16-gauge rustproof steel, baked-on enamel finish in any standard color (no top). Flushtex precast receptor with cadmium treated frame. Chrome plated hot and cold valves, 6-in. centers; adjustable ball joint shower head, soap dish and curtain rod.

Stonebrook 76 in.—A Lower Priced Model

Width by depth: 30x30, 32x32, 36x36 in. *Corner shower* 36x36 in.

Stonebrook — Walls of 18-gauge rustproof steel, baked-on enamel finish in any standard color (no top). Flushtex precast receptor with cadmium treated frame. Chrome plated hot and cold valves, 3⅜ in. centers; adjustable ball joint shower head, soap dish and curtain rod.

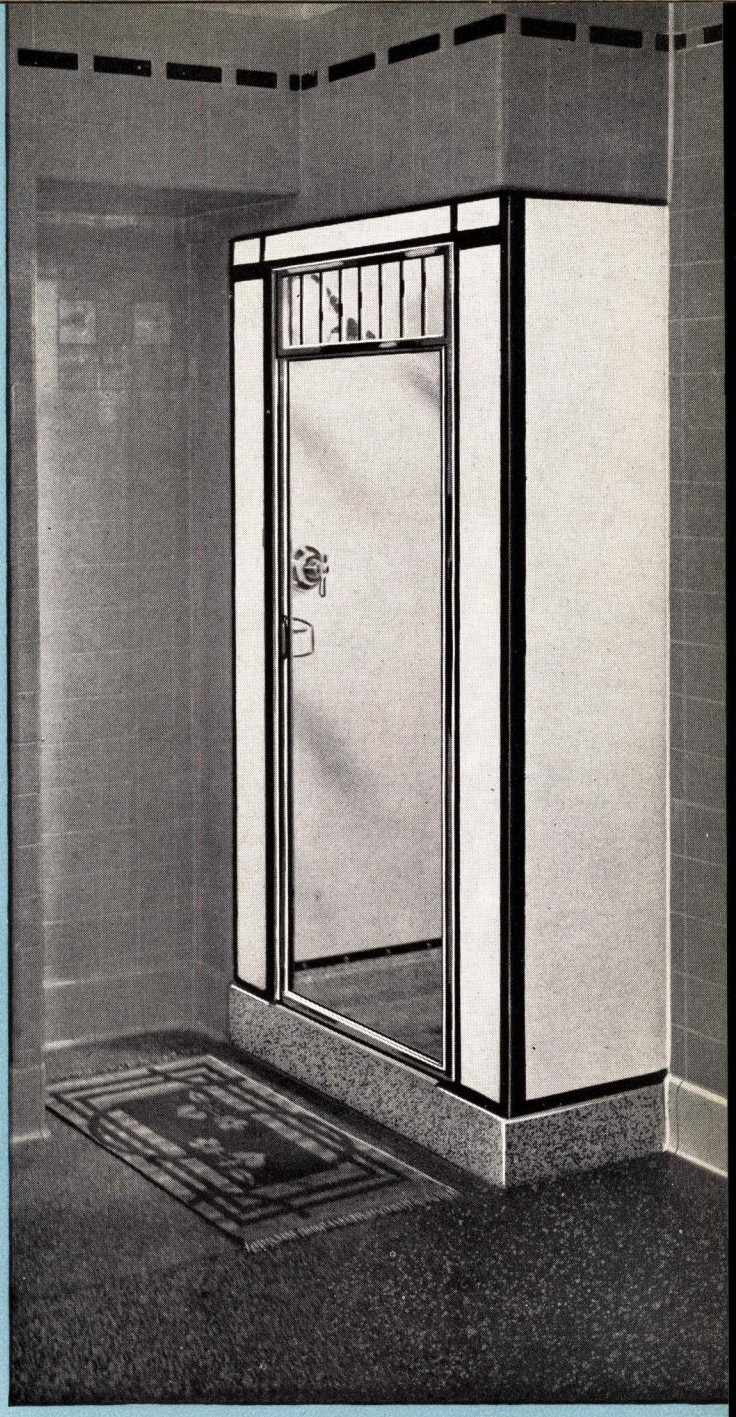
Lower price shower compartments are available for bungalows, cottages and basements. For further details write for circular and price list.



Detail of Shower Receptor

Flush Metal shower compartments are sold exclusively through plumbing contractors

1938



FIAT

SHOWER BATH CABINETS

SHOWER DOORS

GLASS SHOWER ENCLOSURES

GLASS BATH TUB ENCLOSURES

FIAT METAL MANUFACTURING CO., INC.

CHICAGO NEW YORK BOSTON

FIAT *Shower Bath Cabinets*
Glass Shower Doors and Enclosures

Originator and pioneer in the field of "knock-down" shower stalls, Fiat has gained through years of experience and research an invaluable amount of knowledge relative to the manufacture of shower cabinets.

By virtue of this knowledge, Fiat has been recognized as the leading producer of the finest and most complete line of shower stalls, shower doors and glass enclosures.

A large part of the general preference for Fiat leak-proof and rust-proof shower cabinets can be attributed directly to the fact that on all shower models, one type of receptor is used throughout. Whether the terrazzo, carbotex or stonetex type be chosen, the principles of construction of each remain identical. A complete description of each of these types is given elsewhere in this catalog.

We request your careful consideration of the following advantages which we claim for the Fiat precast receptor: First, it is easily installed, requiring only one simple drain connection; second, it is guaranteed leakproof; third, because of its rigid construction and steel mesh reinforcement it is not affected by normal settlement of the building; fourth, it is economical . . . eliminating the cost and labor of installing lead pans; fifth, because of its one-piece construction there are no crevices or joints which are known to be prolific depositories of germs and dirt; lastly, its surface is absolutely non-slip . . . obviating the need for unsightly and uncomfortable ridges or corrugations. There can be but one conclusion . . . Fiat's precast receptor is without a question the ideal shower floor.

Since its very conception, Fiat has consistently adhered to an established policy of distributing its products exclusively through recognized plumbing wholesalers and reliable plumbing contractors.

With factories in Chicago, and Long Island City, with sales offices in New York, Chicago and Boston, and with able representatives in most large cities throughout the United States, Fiat is adequately equipped to render its customers the utmost in service and coöperation.

PRACTICAL
ATTRACTIVE
ECONOMICAL

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For Catalog on Fiat Steel Toilet Partitions See File Index

FIAT METAL MANUFACTURING CO., INC.

CHICAGO
1201 Roscoe Street

NEW YORK
101 Park Avenue

BOSTON
11 Beacon Street

FACTORIES ARE LOCATED IN CHICAGO AND LONG ISLAND CITY

FIAT *Admiral* SHOWER BATH CABINETS » » » » » »

The Admiral line of shower compartments is emblematic of the finest in shower bathing facilities. Measured by the beauty and permanence of its smooth vitreous enameled walls, the strength and rigidity of its construction and the attractiveness of its design, its superiority is at once obvious. Although regularly furnished with a white vitreous enameled finish trimmed in black, colors are available at a nominal extra cost.

The black and white design of the Admiral is harmoniously matched by the terrazzo receptor which is composed of black and white marble chips and white cement. Our large stock of marble chips makes it possible to match the receptor with the color chosen for the shower . . . a possibility which adapts the Admiral for use in the most modern and beautiful bathrooms.

NO. 2A ADMIRAL

THIS LINE OFFERS EIGHT OUTSTANDING DESIGNS

Admiral shower stalls may be conveniently classified into two distinct types: one is adapted for installations where the shower is to be either free-standing or with either side exposed; the other type is used only under conditions where the shower is to be entirely recessed.

< They are illustrated on the following page >

Under the first classification there are four models available . . . the No. 1 and No. 2A square or rectangular showers, and the No. 3 and No. 3A corner entrance types. The No. 2A and No. 3A models are finished in vitreous enamel both on the inside and on the front door stiles (or entrance frames), whereas the No. 1 and No. 3 models have vitreous enameled interiors but with the door entrance frames finished in baked-on enamel instead of vitreous enamel. See page 13 for details of door frame.

There are also four models of the recessed Admiral . . . designs No. 4B (square or rectangular), the No. 3B (corner entrance), both of which are furnished with specially constructed extruded chromium plated brass door frames. Designs No. 4C and No. 3C are identical to No. 4B and No. 3B with this one exception: the door frames are extruded aluminum finished in "alumilite." The object of these special extruded door frame shapes is to permit complete tiling in of the shower . . . made possible by the presence of metal angles to which metal lath can be attached. See page 13 for details.

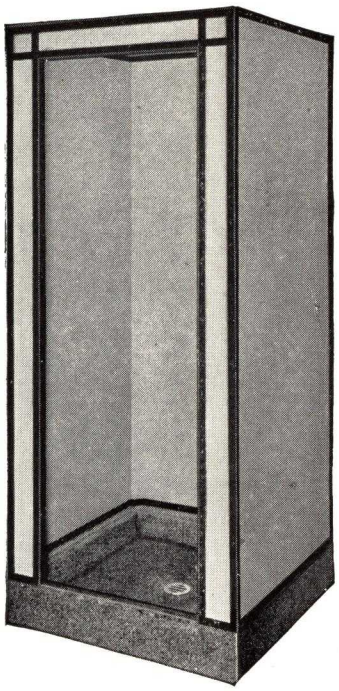
All Admiral showers are furnished with dome light, valves, soap dish and curtain rod as standard equipment . . . and each is adapted to accommodate any one of the three shower doors available.

See Page 16 for sizes—Page 15 for valves

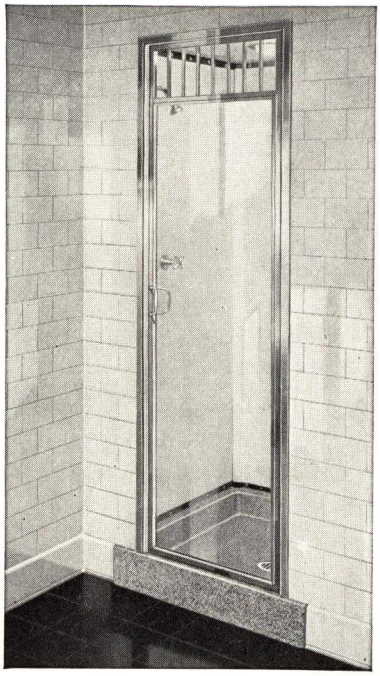
NO. 4B ADMIRAL

FIAT *Admiral* SHOWER CABINETS

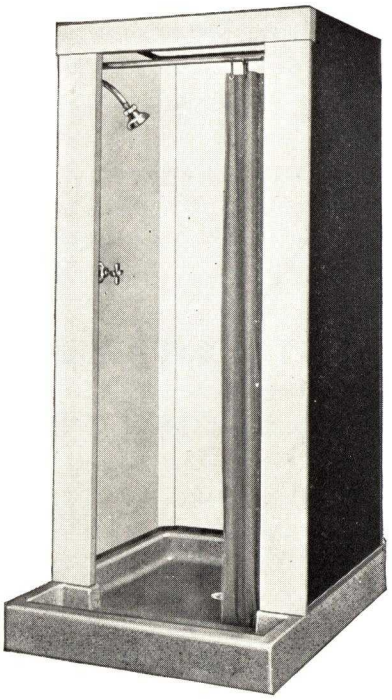
WALLS OF VITREOUS ENAMEL WITH RECEPTORS OF DECORATIVE TERRAZZO



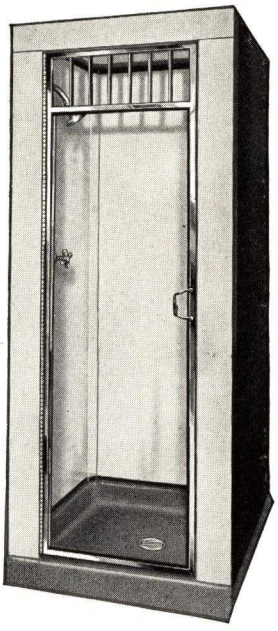
DESIGN NO. 2A WITH REGULAR RECEPTOR
Can be furnished with Extended Receptor



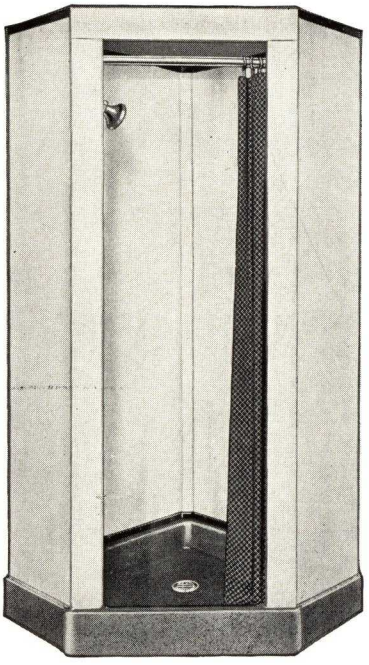
DESIGN NO.4B DE LUXE CHROME-STILE ADMIRAL



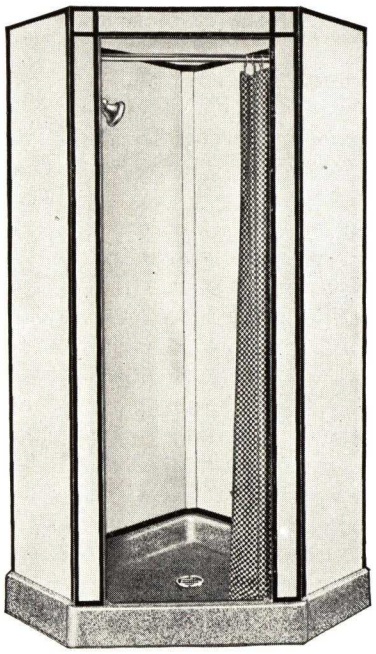
DESIGN NO. 1 ADMIRAL
With Extended Receptor



DESIGN NO. 1 ADMIRAL
With Regular Receptor and Chrome Plated Door



DESIGN NO. 3 ADMIRAL CORNER CABINET
(NOTE: The Corner entrance style of Cabinet may, also, be had in the Ensign, Warrant and Marine designs.)



DESIGN NO. 3A ADMIRAL CORNER CABINET
(NOTE: The corner entrance style of cabinet may, also, be had in the Ensign, Warrant and Marine designs.)

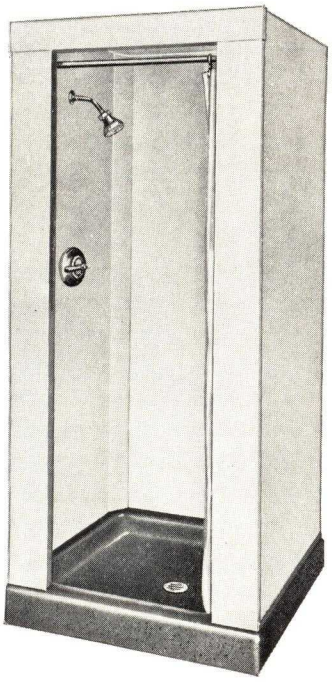
FIAT *Ensign* SHOWER CABINETS

The construction features and standard equipment of the Ensign line are essentially the same as those found in the Admiral. Accordingly, the same classification of models can be followed . . . keeping in mind this one difference between the two: the walls of the Ensign are finished with a high grade synthetic baked-on enamel instead of vitreous enamel.

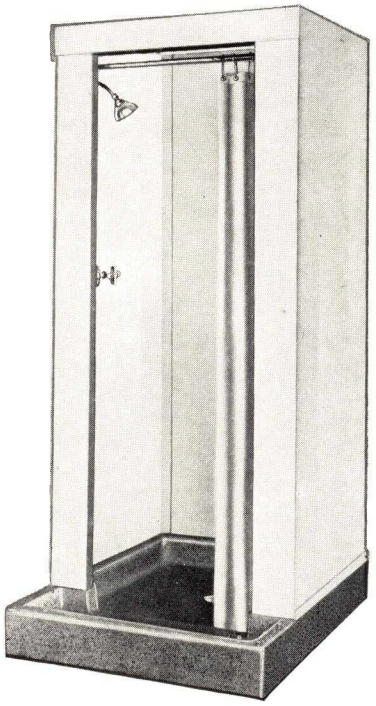
The design No. 6 (square or rectangular) Ensign, and the No. 8 (corner entrance) model are used for either free-standing or partially recessed installations. On page 13 will be found a detailed drawing of door frame. These showers are available for complete recess installations . . . that is, with door frames of either extruded brass or aluminum. See page 13. The brass frames are chromium plated, while the aluminum frames are finished in "alumilite" . . . a special process which preserves the natural finish of the aluminum against corrosive elements.

The same type terrazzo receptor used for the Admiral line is also furnished with the Ensign, and the same opportunity is available for harmonizing the color of the receptor with the walls.

As in the case of the Admiral, standard equipment includes top and dome light, valves, soap dish and curtain rod. Doors can be fitted to any model.



DESIGN NO. 6 ENSIGN
With Regular Receptor
May be had in corner design of cabinet



DESIGN NO. 6 ENSIGN
With Extended Receptor

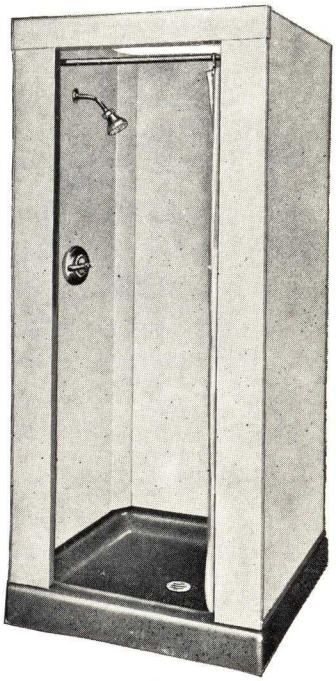
FIAT *Warrant* SHOWER CABINETS

The Warrant shower compartment is offered for consideration in those instances where it is desired to reduce the cost of the shower, but yet retain most of the features found in the Ensign and Admiral stalls. From the details shown on page 13 it can be seen that the construction of the Warrant is identical to that of the Ensign. However, there are these two important differences between the Ensign and Warrant stalls: First, a carbotex receptor instead of terrazzo is furnished on the Warrant; second, no top is included.

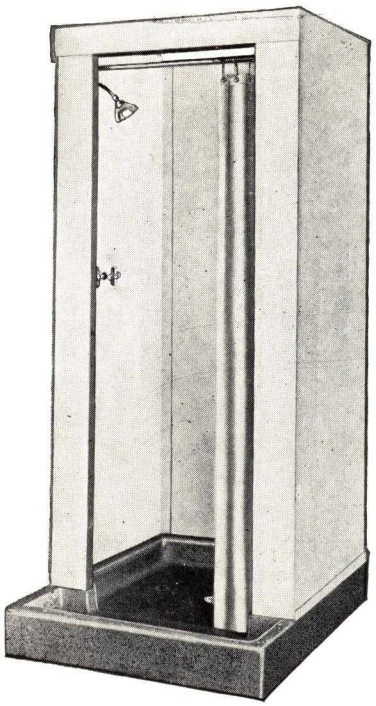
The carbotex receptor, presenting an entirely different appearance from the terrazzo, has a distinctiveness all of its own. Cast from the same mould as the terrazzo, it varies only in the kind of material with which it is cast: White stone chips, white cement and carborundum flakes comprise its makeup.

Available in both the square or rectangular model and the corner entrance type, and finished in color if desired. Standard equipment is the same as furnished on both the Admiral and Ensign with the exception of top and dome light.

See Page 16 for Sizes

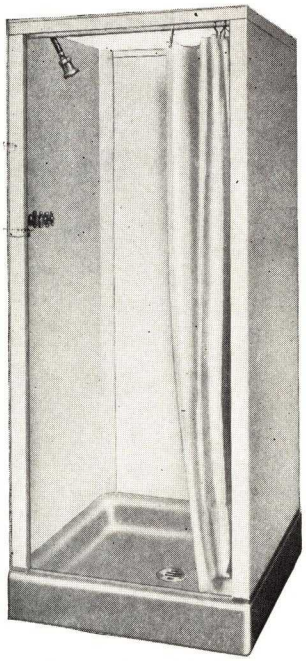


DESIGN NO. 12 WARRANT
With Regular Receptor
May be had in corner entrance style of cabinet



DESIGN NO. 12 WARRANT
With Extended Receptor

FIAT *Marine* SHOWER CABINETS



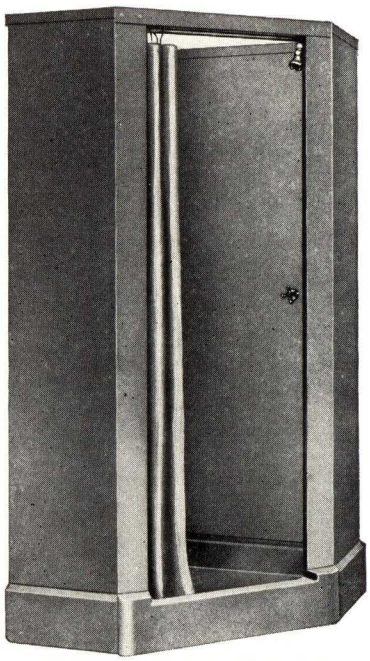
DESIGN NO. 15 MARINE
With regular receptor —can be furnished with extended receptor

Featured with Fiat's most recent achievement . . . the reversible panel . . . the Marine now assumes a higher degree of flexibility for installation purposes than has ever been known before. By "reversible panel" is meant, briefly: for standard drillings as shown on pages 14 and 15, one side panel will be so drilled as to be suited for valve location on either the right or left side of the stall.

The advantages of such an arrangement are paramount in importance because it greatly reduces the volume of ordering detail, makes it possible to ship such showers the same day orders are received, and perhaps of even greater significance, it facilitates the stocking of standard Marines. Unless the shower is furnished with standard drilling (see pages 14 and 15), it can not be made reversible.

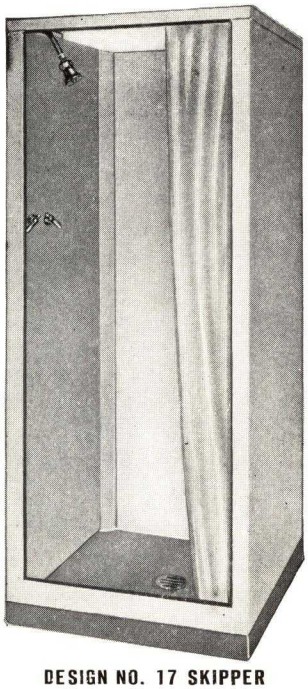
Finished in a light green baked-on enamel, furnished complete with stonetex receptor (refer to page 10 for details), chromium plated valves, shower head, soap dish, curtain rod, and an 8-ounce white duck curtain . . . the Marine possesses all of the essential features to make it attractive in appearance as well as durable and leakproof in construction.

See Page 16 for sizes



DESIGN NO. 16 CORNER MARINE

FIAT *Skipper* SHOWER CABINETS



DESIGN NO. 17 SKIPPER

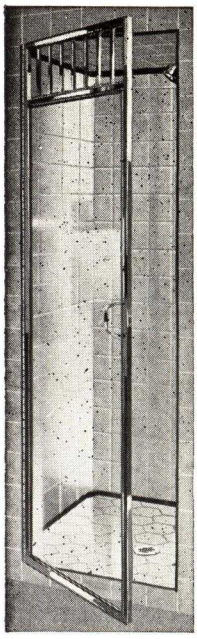
The Skipper compartment, also furnished with the new reversible panel as standard equipment, is elevated to a higher level of quality and practicability. Although designed and priced especially for low-cost installations, the inter-relation of its various parts is similar to the construction characteristic of the more expensive stalls.

The stonetex receptor used on the Skipper, although of slightly different form than the types used with the Marine, Warrant and Ensign models, embodies exactly the same features of construction.

Standard equipment includes dull chrome-plated shower valves and head, nickel-plated soap dish, black enameled curtain rod and an 8-ounce white duck curtain. Polished chromium fittings and baked enamel finish can be obtained at a small added cost.

See Page 13 for details of construction—
Page 16 for sizes

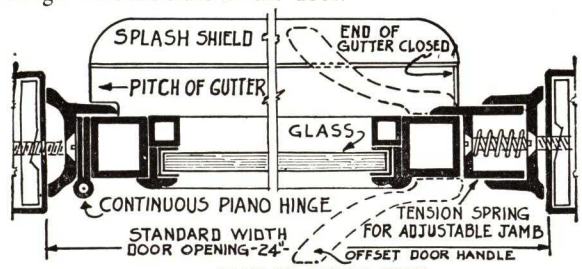
Senior DOOR



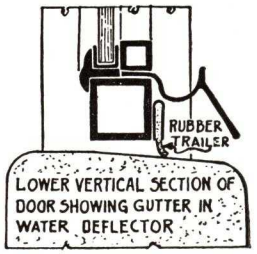
CONSTRUCTION FEATURES

Frame—Heavy brass seamless tubing ¾" x ¾" and ⅜" x ⅜" with extruded brass mouldings.
Jambs—Extruded brass; strike side of two channels and tension springs forming the adjustable jamb.
Hinge—Specially constructed, leakproof continuous brass piano hinge.
Lock—Double acting friction catch guaranteed against door binding.
Glass—Clear or obscure, set into a heavy rubber "U" channel held in place and fitted into heavy extruded brass mouldings in such a manner that the glass can be replaced without dismantling the door.
Handles—Special off-set design on both sides of the door.
Water Deflector—Made of 18 Ga. brass with gutter to prevent water from dripping onto the floor when the door is opened.
Grille Vent—7 inch high bars of ⅜" x ⅜" seamless brass tubing.
Finish—Heavy chromium plating.

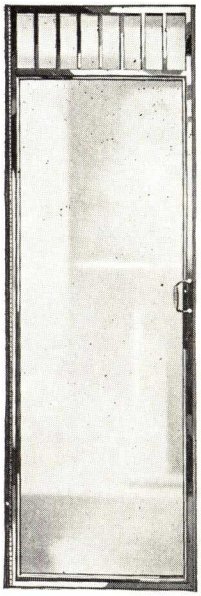
Built for installation on marble, tile, structural glass or on Fiat showers. The adjustable jamb has an adjustment of $\frac{3}{16}$ inch each way; a total of ⅜ inch to take up irregularities in the openings on which it is installed.



PLAN OF SENIOR DOOR



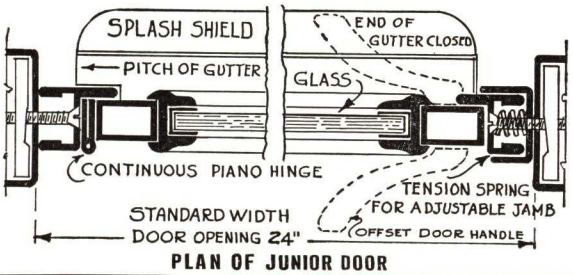
Junior DOOR



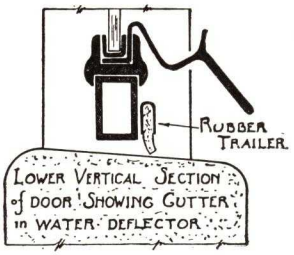
CONSTRUCTION FEATURES

Frame—½" x ¾" seamless brass tubing with extruded brass mouldings.
Jambs—Double formed 18 Ga. brass; strike side of two channels and tension springs forming the adjustable jamb.
Hinge—Specially constructed, leakproof continuous brass piano hinge.
Lock—Two bullet catches, guaranteed against door binding.
Glass—Clear or obscure, set into a heavy rubber "U" channel.
Handles—Special offset design on both sides of door.
Water Deflector—Made of 18 Ga. brass with gutter to prevent water from dripping onto the floor when the door is opened.
Grille Vent—7 inch high bars of ⅜" x ⅜" seamless brass tubing.
Finish — Heavy chromium plating.

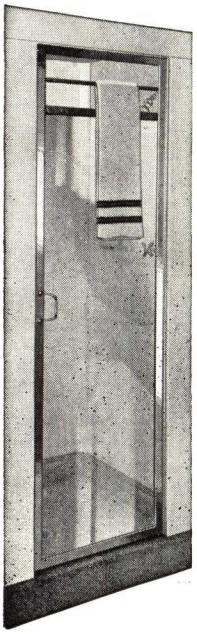
Built for installation on marble, tile, structural glass or on Fiat showers. The adjustable jamb has an adjustment of ⅛ inch each way; a total of ¼ inch to take up irregularities in the openings on which it is installed.



PLAN OF JUNIOR DOOR



Zephyr DOOR



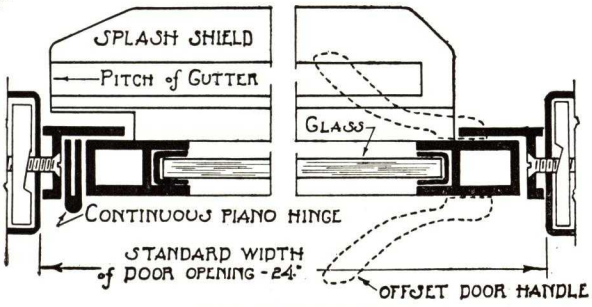
CONSTRUCTION FEATURES

Frame—One-piece extruded aluminum alloy frame.
Jambs—Extruded aluminum alloy.
Hinge—Specially constructed, leakproof continuous aluminum piano hinge.
Lock—Two bullet catches, guaranteed against door binding.
Glass—Clear or obscure, set into a heavy rubber "U" channel.
Handles—Special offset design on both sides of door.
Water Deflector—Made of extruded aluminum with gutter to prevent water from dripping onto the floor when the door is opened.
Vent—Horizontal solid aluminum towel bar.
Finish—"Alumilite."

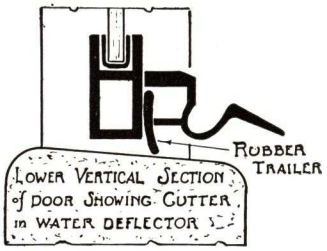
Built for installation on tile, structural glass or on Fiat showers. The only door of light weight aluminum with the beautiful silver-like "Alumilite" finish.

When ordering give hand of doors — right or left.

See Page 16 for sizes.

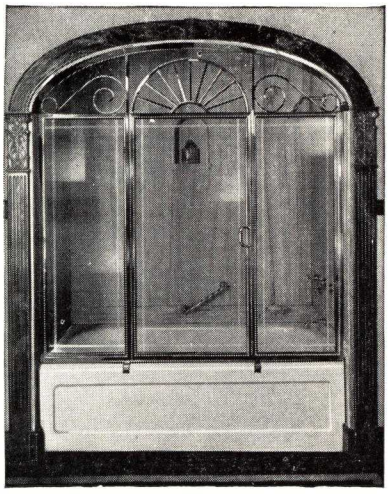


PLAN OF ZEPHYR DOOR

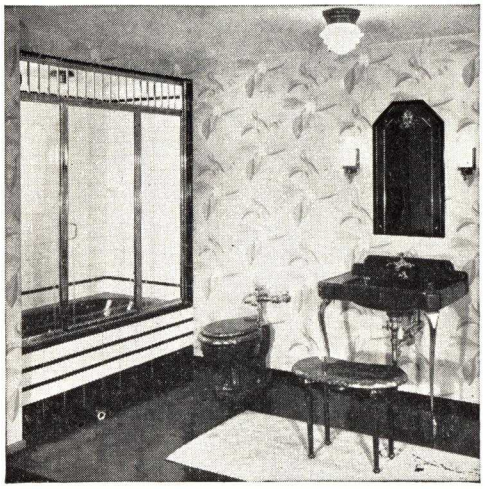


FIAT CHROMIUM PLATED GLASS *Bath Tub Enclosures*

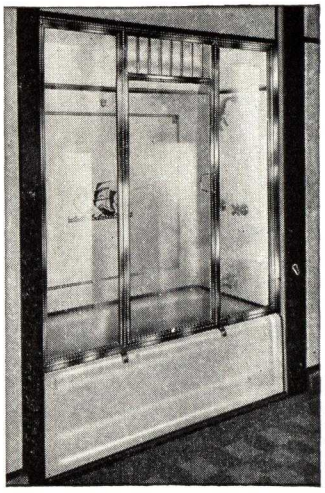
ADD DISTINCTION TO THE MODERN BATHROOM



SPECIAL DESIGN NO. 401 S



DESIGN NO. 401 S



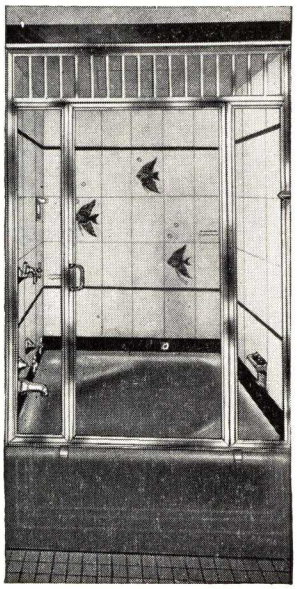
DESIGN NO. 402 S

Fiat chromium plated glass bath tub enclosures are adaptable to both recessed and corner tubs . . . converting the bath tub into a watertight shower enclosure and adding greatly to the utility and beauty of the modern bathroom.

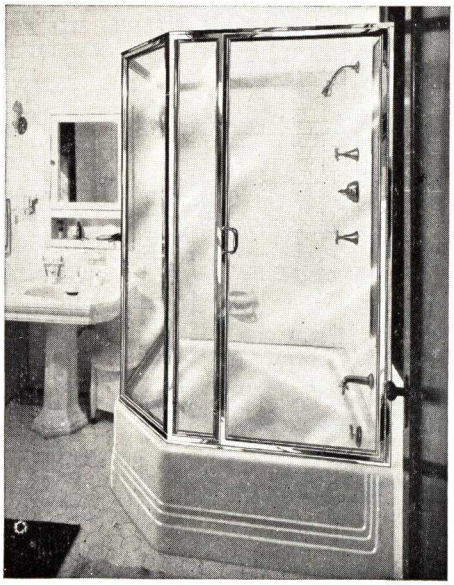
There are numerous combinations of glass panels and doors available (see page 12), and every model is so designed as to be in harmony with modern architectural trends.

All bath tub enclosures are built to conform with actual measurements and embody the same features of construction which characterize the Senior door.

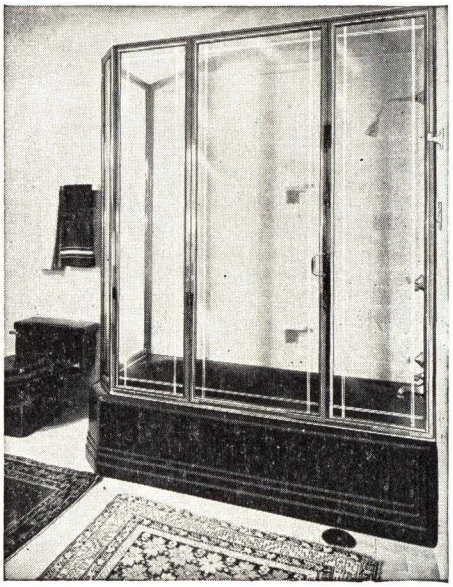
For details see Page 12



DESIGN NO. N-401 S
(NEO-ANGLE TUB)

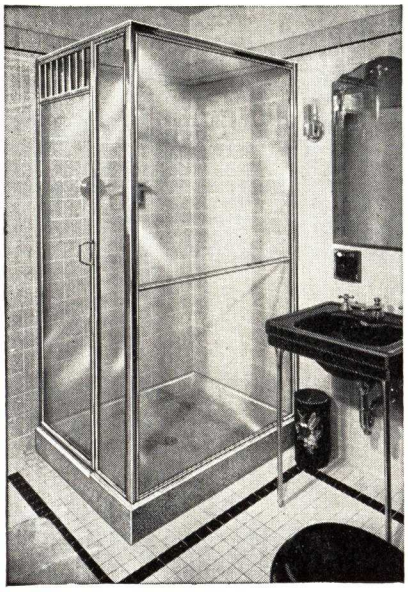


DESIGN NO. N-500 S
(CORNER NEO-ANGLE TUB)

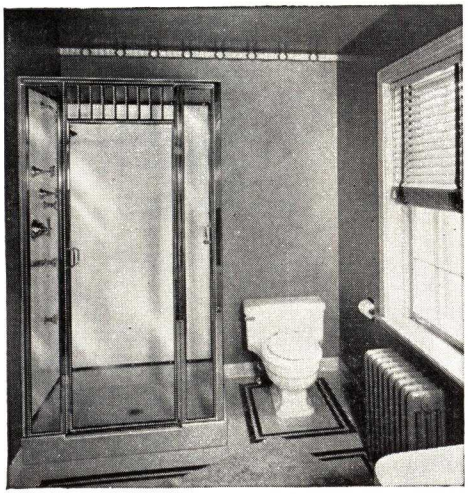


DESIGN NO. 500 S

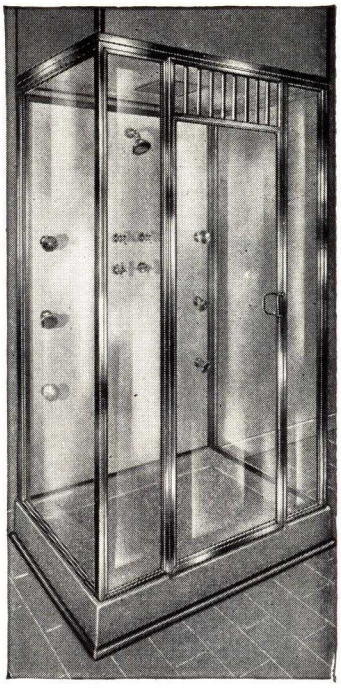
FIAT CHROMIUM PLATED GLASS *Shower Enclosures*



DESIGN NO. 1001 C



DESIGN NO. 3000 C

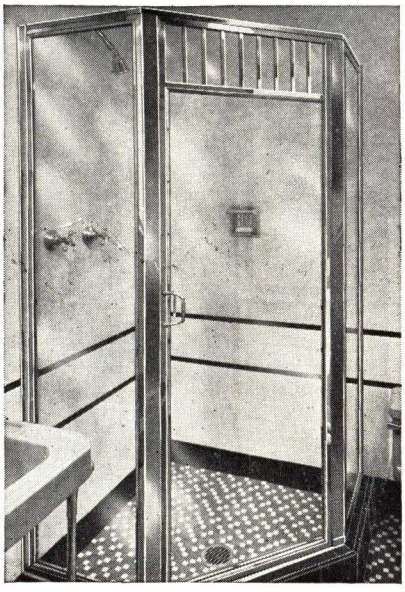


SPECIAL DESIGN NO. 3000 C

The lasting beauty of their simplicity and their rigid leakproof construction make Fiat glass enclosures the finest in both design and construction.

These enclosures are easily installed and are furnished complete with dome light, valves, soap dish, vitreous enameled back panels and top.

When it is desired to retain the tile, structural glass walls or other wall surfaces in the bathroom, the enclosure can be furnished without the back walls and top. In this manner, the receptor and glass panels combine with existing background walls to form an attractive and thoroughly leakproof unit.

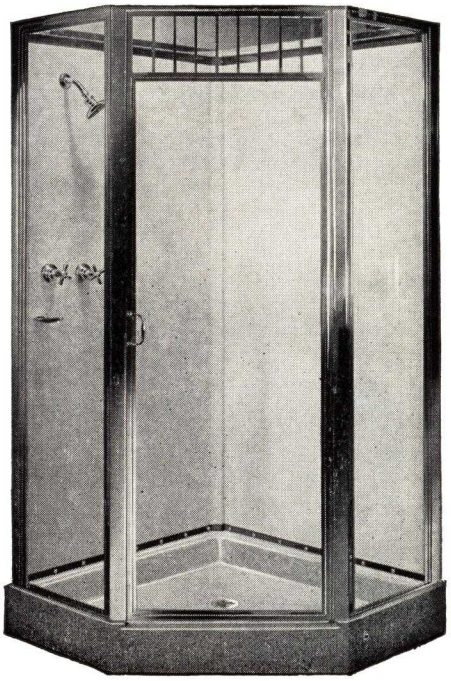


DESIGN NO. 2002 C

Special

SHOWER ENCLOSURES

In certain instances, Fiat engineers are called upon to design special cabinets to accommodate receptors and background walls which are either already in place or are being furnished by others. When contemplating building such a shower it is advisable to present your problem to us so that the material we furnish will be in exact correlation with the balance of the shower unit.



DESIGN NO. 2000 C

For details see Page 12, and for sizes, Page 16

RECEPTOR DETAILS

All Fiat receptors are precast, thoroughly cured at the factory, and are easily connected to the plumbing drains, providing a sanitary, leakproof shower floor.

REGULAR RECEPTOR

RECEPTOR COMPOSITIONS

TERRAZZO

(Admiral and Ensign Models)—Aggregate of white cement, black and white marble chips—chemically waterproofed.

CARBOTEX

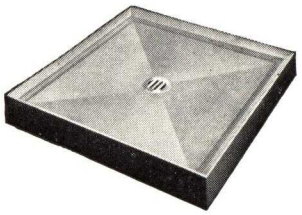
(Warrant Model)—Aggregate of white cement, white crushed stone with carborundum flakes—chemically waterproofed.

STONETEX

(Marine and Skipper Models)—Aggregate of white and gray portland cement and crushed stone, chemically waterproofed.

CORNER RECEPTOR

EXTENDED RECEPTOR



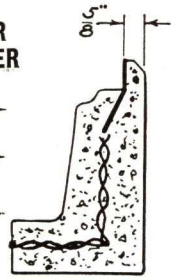
FLAT RECEPTOR

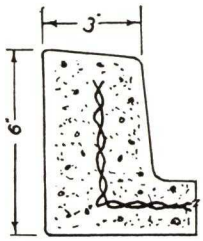
SECTION OF RECEPTOR WITH DELUXE SHOULDER

Heavy shoulder to conceal flange.

Perforations in flange to insure bond.

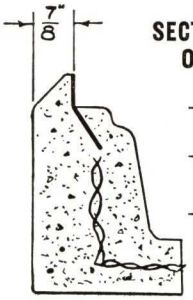
Heavy expanded re-enforcing steel mesh throughout entire receptor.





SECTION THROUGH THRESHOLD

Note that the threshold slopes in to keep water from draining out on to the floor.



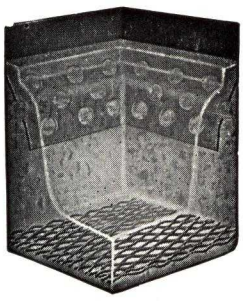
SECTION THROUGH FRONTS OF CORNER RECEPTOR

Heavy shoulder to conceal flange.

Perforations in flange insure bond.

Heavy expanded re-enforcing steel mesh throughout entire receptor.

SECTION OF REGULAR RECEPTOR



Heavy galvanized steel flange thoroughly embedded in the body of receptor encases bottom of compartment making leakage impossible.

Perforations in flange insure bond.

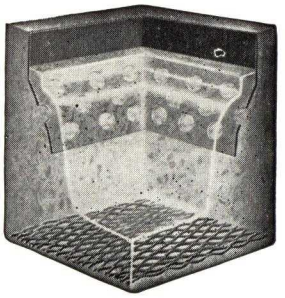
Heavy expanded re-enforcing steel mesh throughout entire receptor.

SECTION OF RECEPTOR FOR GLASS CABINETS

Heavy shoulder 5/8 inch thick to hide flange.

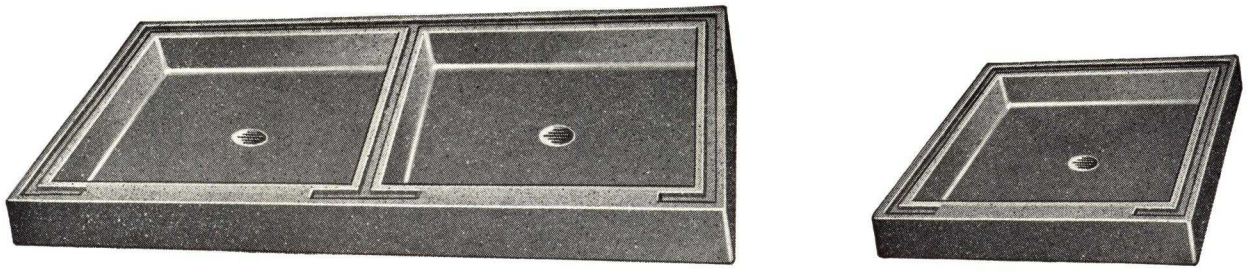
Perforations in flange to insure bond.

Heavy expanded re-enforcing steel mesh throughout entire receptor.



RECEPTOR DETAILS

Rabbeted Receptors for Marble and Slate Walls



SINGLE OR DUAL AND IN TERRAZZO ONLY

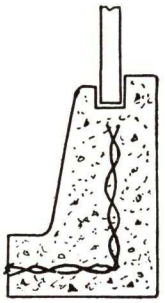
Fiat precast leakproof rabbeted receptors are most suitable for marble and slate shower inclosure wall construction. Note that the heavy shoulders of the receptor are rabbeted so that the slate or marble walls can be set in the receptor body and cemented in, making a thoroughly leakproof joint between wall and receptor.

SECTION OF RABBETED RECEPTOR

Rabbeted to accommodate shower walls. →

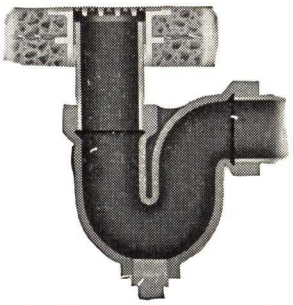
Heavy shoulders with the higher one on the outside to prevent leakage. →

Heavy expanded re-enforcing steel mesh throughout entire receptor. →



SHOWER DRAIN

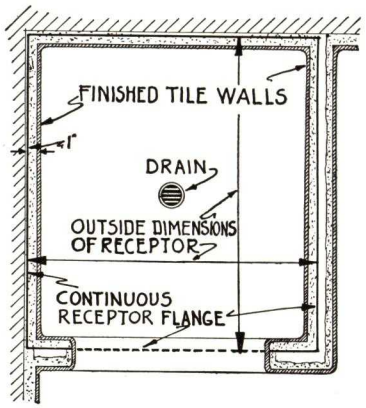
Chromium plated drain connection with a four-inch removable strainer plate which allows for inside lead caulk joint with 2-inch iron pipe and "P" trap. The drain connection is supplied with heavy lugs which insure bond when it is cast integral with the receptor. This drain connection is standard on all Fiat receptors. Fiat does not supply the 2-inch iron pipe and "P" trap.

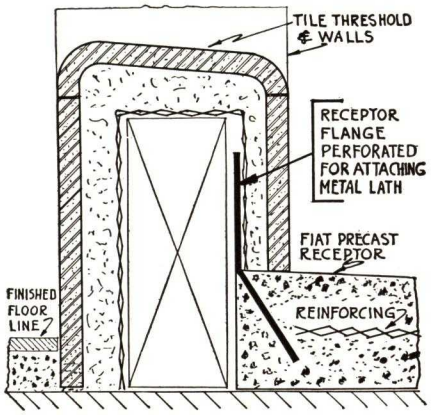


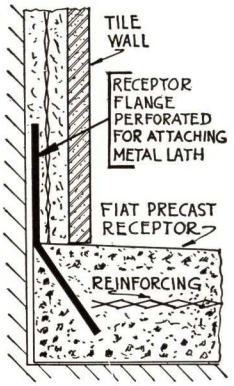
SECTION THROUGH SHOWER DRAIN

FIAT LEAKPROOF RECEPTOR FOR TILE SHOWER

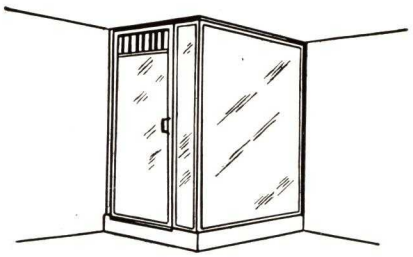
The Fiat leakproof receptor for tile shower inclosures is clearly shown in line drawings below so that the proven leakproof qualities of this type of Fiat receptor may be fully appreciated. Note that this receptor is a complete precast and thoroughly leakproof sanitary shower flooring with drain cast integral. This type of Fiat receptor is completely encased by a heavy galvanized steel flange which extends 1½ inches above the receptor floor, thus eliminating every possibility of leakage at tile wall and floor joint. Fiat receptors are not affected by timber shrinkage, vibrations and settling of buildings and the need for a lead pan is completely eliminated.

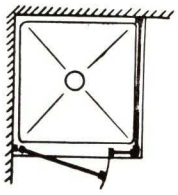




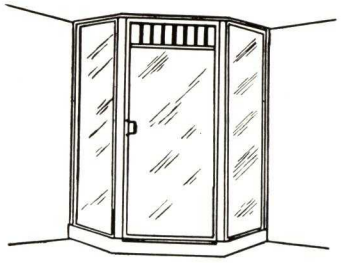


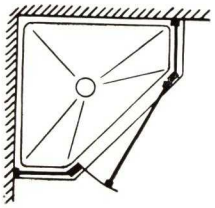
GLASS SHOWER CABINETS



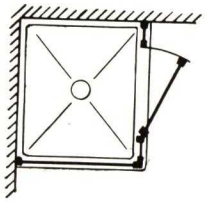


1000C—Furnished complete with back walls and top of vitreous enamel, dome light, soap dish and receptor.
1001C—Furnished only with receptor, two glass panels and door.
1002C—Furnished only with two glass panels and door. (Custom built.)





2000C—Furnished complete with back walls and top of vitreous enamel, dome light, soap dish and receptor.
2001C—Furnished only with receptor, two glass panels and door.
2002C—Furnished only with two glass panels and door. (Custom built.)



3000C — Furnished complete with back walls and top of vitreous enamel, dome light, soap dish and receptor.
3001C — Furnished only with receptor, three glass panels and door.
3002C — Furnished only with three glass panels and door.

NOTE—All glass cabinets are built of Fiat "Senior" construction. (See page 7.) The height of all glass panels is 76 inches plus 6 inches (the height of the receptor), making a total of 82 inches overall. No glass panel will be made over 45 inches in width. All doors, except those on corner cabinets, are to be 24 inches wide.

GLASS BATH TUB ENCLOSURES

All glass bath tub enclosures are built of Fiat "Senior" construction. (See page 7.) The standard height for panels is 60 inches. The standard width of door opening on all bath tub enclosures is 26 inches. All enclosures are custom built to measurements taken at the job site.

RECOMMENDED FOR—

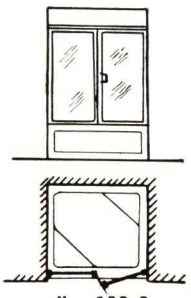
Tubs 55 inches in length or shorter—Designs No. 100S, 101S, 400S, 401S and 402S.

Tubs over 55 inches long—Designs No. 300S, 301S, 400S, 401S and 402S.

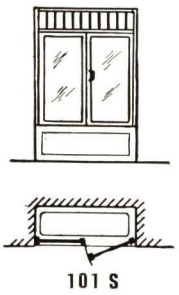
Corner Standing Tubs—Design No. 500S.

Neo-angle Tubs—Designs No. N-100S, N-101S, N-400S, N-401S, N-402S and N-500S.

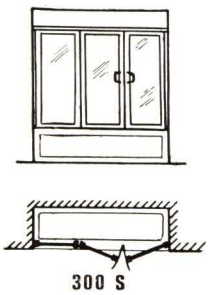
NOTE—When an enclosure is used on a Neo-Angle tub, the design number is preceded by N—.



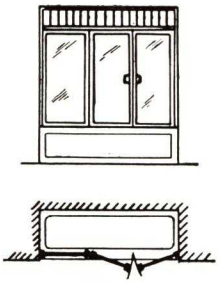
N - 100 S



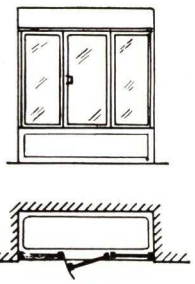
101 S



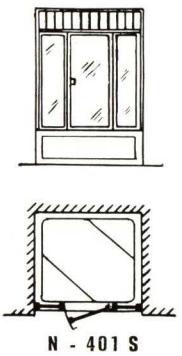
300 S



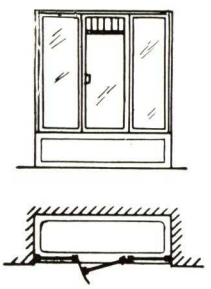
301 S



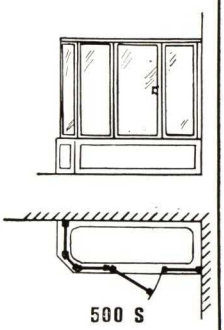
400 S



N - 401 S



402 S



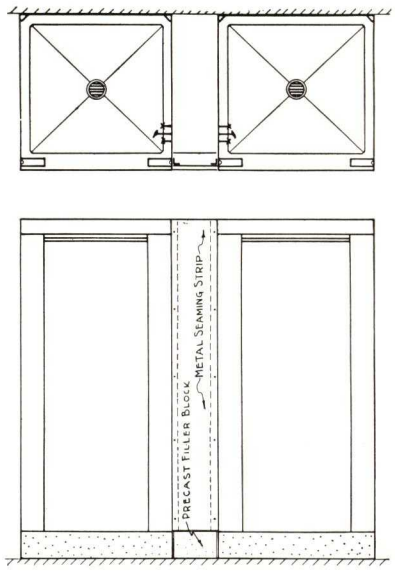
500 S

NOTE—Design N-500S is similar to 500S but has only three glass panels and a door.

For sizes on shower cabinets and tub enclosures see page 16

CONSTRUCTION DETAILS

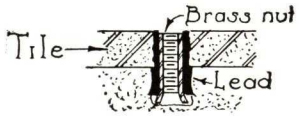
SEAMING STRIP



When shower cabinets are installed in series, seaming strip (cover plate) can be supplied to conceal working space between units.

ENCLOSURE AND DOOR WALL CONNECTIONS

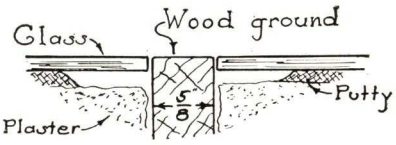
TILE



A lead anchor furnished by us is used for fastening purposes. The door or enclosure is securely fastened to lead anchors with machine screws.

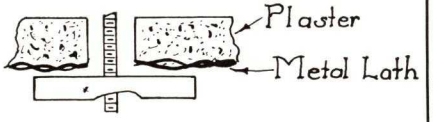
These three approved methods of making wall connections are recommended for installing Fiat glass shower doors, bath tub enclosures and glass shower cabinets where the back walls are of tile or structural glass. These connections are the easiest and most economical to use and assure reliable and continued service.

STRUCTURAL GLASS



A wood ground is put up on the rough plaster, and is to be flush with the finished wall. Wood screws are then used to fasten the door or enclosure to the wall.

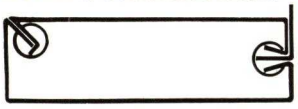
PLASTER WALLS



On plaster walls a hole is first drilled through the metal lath and the door securely fastened by use of toggle bolts. This type of connection is also used on hollow metal door pilasters.

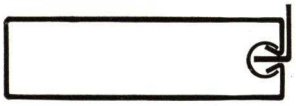
DOOR ENTRANCE FRAME CONSTRUCTIONS

This construction used in **Nos. 2A and 3A Admiral designs.**



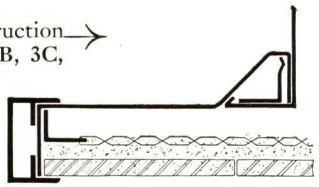
Doorway Frame of Standard Hollow Metal Construction finished inside and out in vitreous (porcelain) enamel.

This type of construction used in **No. 1 and No. 3 Admiral, Nos. 6 and 8 Ensign and the No. 12 and 14 Warrant.**



Doorway Frame of Standard Hollow Metal Construction—Made of 16-gauge Galvannealed Steel.

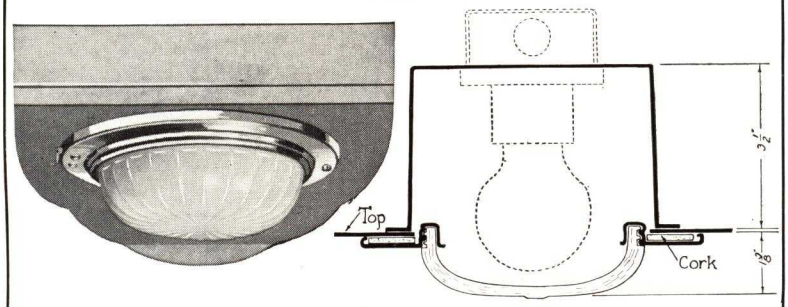
This construction used on **Nos. 3B, 3C, 4B and 4C Admirals. Also on Nos. 8B, 8C, 9B and 9C Ensign.**

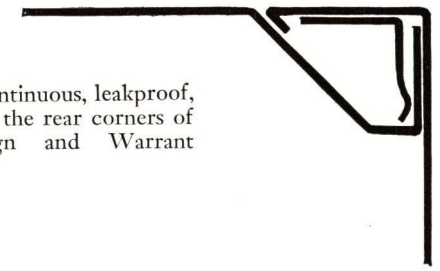


Doorway Frame of Chromium plated extruded brass, or extruded aluminum "Alumilite" plated.

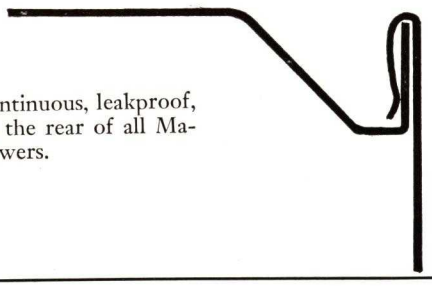
This construction used on **Marine and Skipper Models.**

FIAT DOME LIGHT





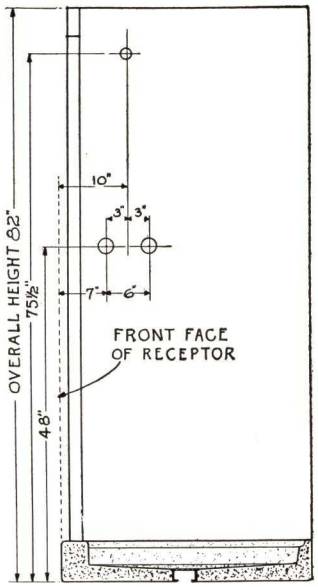
Section showing continuous, leakproof, spring keyed joint at the rear corners of all Admiral, Ensign and Warrant showers.



Section showing continuous, leakproof, spring keyed joint at the rear of all Marine and Skipper showers.

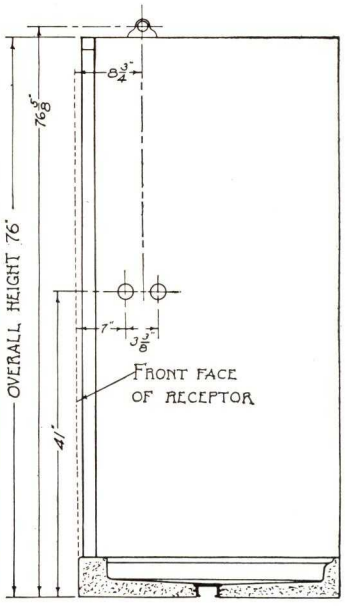
ROUGHING-IN DETAILS

FOR ADMIRAL, ENSIGN AND WARRANT



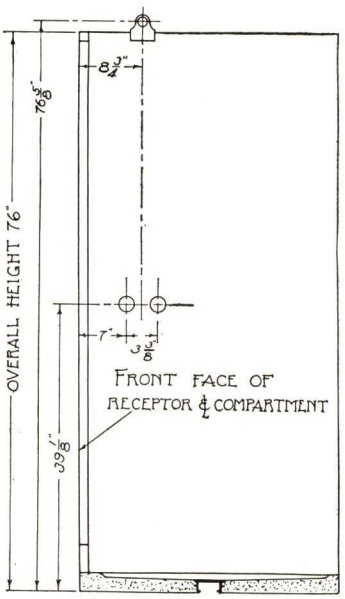
DRILLING FOR K-7000 VALVES

FOR MARINE



DRILLING FOR C-4412 VALVES

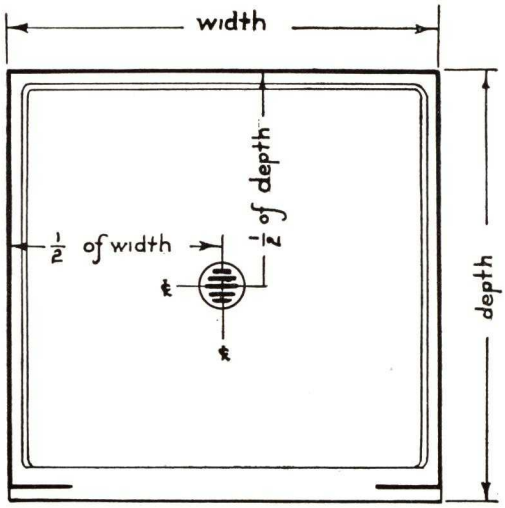
FOR SKIPPER



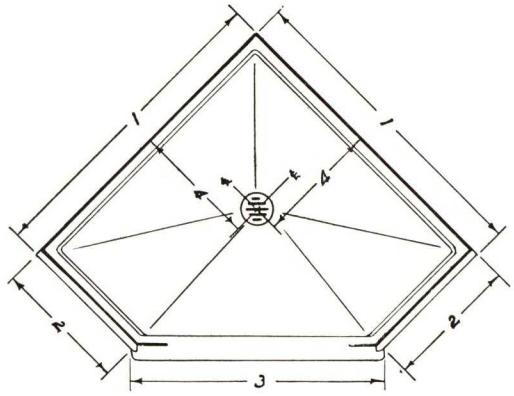
DRILLING FOR FH-101 VALVES

When ordering Admiral, Ensign or Warrant showers specify location of valves, that is, whether on the right or on the left-hand side of the shower when facing the entrance. Do not place the valves on the back panel of the cabinet as the stream of water will play directly on the door opening. Such an installation is likely to splash water over the threshold of the receptor preventing the user from tempering the water without getting wet or possibly scalded.

REGULAR RECEPTOR



CORNER RECEPTOR

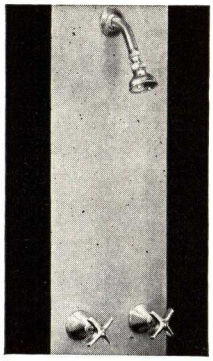


On a regular receptor the drain is always located in the center of the receptor. The only time the drain is not in the exact center is when only one side of the receptor has a deluxe shoulder. In that case the drain is located at what would be the center if the receptor had no deluxe shoulder. See section of deluxe shoulder on page 10. The thickness of this shoulder is added to the dimensions of the receptors given on page 16.

Two Sizes Only		
36" x 36"		42" x 42"
36⅞"	Dimension No. 1	42⅞"
14 13/16"	Dimension No. 2	19 5/16"
31½"	Dimension No. 3	33½"
13½"	Dimension No. 4	16½"

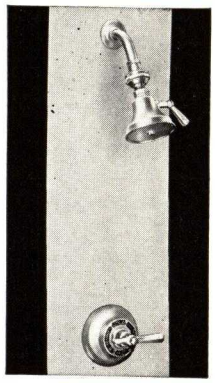
VALVES

The various valve and shower head combinations furnished with Fiat stalls are manufactured to our specifications and are furnished with a lock-nut arrangement, which assures proper escutcheon contact with metal walls. Each set of valves is equipped with removable seats and all shower heads are equipped with adjustable ball joints. All combinations are finished in polished chromium excepting FH101 which is regularly furnished in dull chromium; but available in polished chromium at a small additional cost. These various valve combinations are listed on the following page.



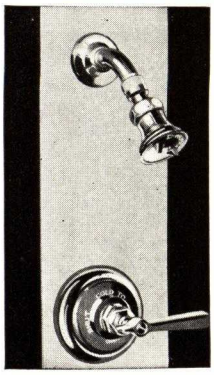
K-7000

A 6″ center, hot and cold water valve, standard equipment or Admiral, Ensign and Warrant Showers		On Admiral, Ensign, or Warrant Showers	On Marine Showers
Shower Head	Height from bottom of receptor	75½″	76⅝″
	Distance from front of receptor	10″	10″
	Distance from edge of front pilaster	9″	9″
Valves	Height from bottom of receptor	48″	41″
	Distance from front edge of receptor to first hole	7″	7″
	Distance from edge of front pilaster to first hole	6″	6″



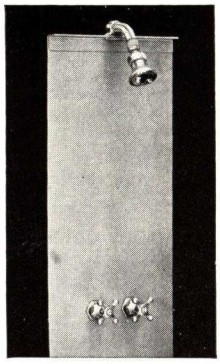
K-2600 SENIOR MIXER

Can be furnished on Admiral, Ensign, Warrant or Marine Showers		On Admiral, Ensign, or Warrant Showers	On Marine Showers
Shower Head	Height from bottom of receptor	78″	76⅝″
	Distance from front edge of receptor	10″	10″
	Distance from edge of front pilaster	9″	9″
Valves	Height from bottom of receptor	54″	41″
	Distance from front edge of receptor	10″	10″
	Distance from edge of front pilaster	9″	9″



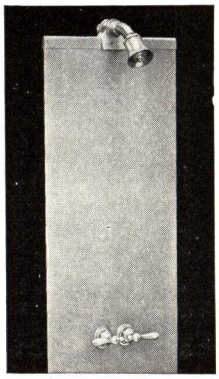
C-4396 JUNIOR MIXER

Can be furnished on all Fiat Showers		On Admiral Ensign, or Warrant Showers	On Marine Showers	On Skipper Showers
Shower Head	Height from bottom of receptor	78″	76⅝″	76⅝″
	Distance from front edge of receptor	10″	10″	10″
	Distance from edge of front pilaster	9″	9″	10″
Valves	Height from bottom of receptor	54″	41″	39⅛″
	Distance from front edge of receptor	10″	10″	10″
	Distance from edge of front pilaster	9″	9″	10″



C-4412

The 3⅜″ center hot and cold water valve, standard equipment on Fiat Marine Showers		On Marine Showers	On Skipper Showers
Shower Head	Height from bottom of receptor	76⅝″	76⅝″
	Distance from front edge of receptor	8¾″	8¾″
	Distance from edge of front pilaster	7¾″	8¾″
Valves	Height from bottom of receptor	41″	39⅛″
	Distance from front edge of receptor to first hole	7″	7″
	Distance from edge of front pilaster to first hole	6″	7″



FH-101

The 3⅜″ center, hot and cold water valve, standard equipment on Fiat Skipper Showers		On Marine Showers	On Skipper Showers
Shower Head	Height from bottom of receptor	76⅝″	76⅝″
	Distance from front edge of receptor	8¾″	8¾″
	Distance from edge of front pilaster	7¾″	8¾″
Valves	Height from bottom of receptor	41″	39⅛″
	Distance from front edge of receptor to first hole	7″	7″
	Distance from edge of front pilaster to first hole	6″	7″

NOTE: All dimensions given above are to center lines.

SIZES

Admiral Line

Regular Receptor	Extended Receptor
W-D-H	W-D-H
30x30x82	30x42x82
30x32x82	.....
32x32x82	32x44x82
34x34x82	34x46x82
30x36x82	.....
36x30x82	36x42x82
36x36x82	36x48x82
36x42x82	.....
42x36x82	42x48x82
42x42x82	.....
46x36x82	.....
48x30x82	.....
48x36x82	.....
46x44x82	.....
Corner Type	
36x36x82	.....
42x42x82	.....

Ensign Line

Regular Receptor	Extended Receptor
W-D-H	W-D-H
30x30x82	30x42x82
30x32x82	.....
32x32x82	32x44x82
34x34x82	34x46x82
30x36x82	.....
36x30x82	36x42x82
36x36x82	36x48x82
36x42x82	.....
42x36x82	42x48x82
42x42x82	.....
46x36x82	.....
48x30x82	.....
48x36x82	.....
46x44x82	.....
Corner Type	
36x36x82	.....
42x42x82	.....

Warrant Line

Regular Receptor	Extended Receptor
W-D-H	W-D-H
30x30x82	30x42x82
30x32x82	.....
32x32x82	32x42x82
34x34x82	34x46x82
30x36x82	.....
36x30x82	36x42x82
36x36x82	36x48x82
36x42x82	.....
42x36x82	42x48x82
42x42x82	.....
46x36x82	.....
48x30x82	.....
48x36x82	.....
46x44x82	.....
Corner Type	
36x36x82	.....
.....	.....

Marine Line

Regular Receptor	Extended Receptor
W-D-H	W-D-H
30x30x76	30x42x76
32x32x76	32x44x76
36x36x76	36x48x76
Corner Type	
36x36x76	

Skipper Line

Width	Depth	Height
30	30	76
36	36	76

NOTE — Skipper showers are not available in corner entrance type or with an extended receptor.

GLASS SHOWER ENCLOSURES

1000C and 1001C

Width	Depth	Height
30	30	82
30	32	82
32	32	82
34	34	82
30	36	82
36	30	82
36	36	82
36	42	82

2000C and 2001C
Corner Type
36x36x82
42x42x82

3000C and 3001C

Width	Depth	Height
42	36	82
42	42	82
46	36	82
48	30	82
48	36	82
46	44	82

NOTE—Designs 1002C, 2002C, and 3002C are custom built to dimensions taken at the job site. No panels over 45 inches by 76 inches will be built.

RECEPTORS FOR

Tile

Width	Depth
30″	30″
36″	36″
42″	42″

Marble

Width	Depth
36″	36″
72″	36″

When ordering receptors for marble, the thickness of the marble must appear on the order. The standard opening between the rabbets where the entrance is to be is 24 inches.

SPECIAL RECEPTORS

A special receptor of any kind or size can be furnished upon receipt of complete details of the requirements of the particular installation for which the receptor is to be used.

BATH TUB ENCLOSURES

State clearly the design No. or send a sketch of the elevation and plan and also state whether or not the enclosure is to be built over a wainscot. Upon receipt of this information Fiat will then send a form that is to be filled out in order that all necessary information for manufacturing can be secured.

WHEN ORDERING SHOWER CABINETS

State design and size clearly.

State color clearly. If other than standard color is required submit sample.

When ordering Admiral cabinet for installation not in recess (meaning both side walls and back concealed) state clearly what sides—right or left or back when facing—are exposed and to be finished same as interior.

State whether individual compression or mixing valves are required.

State location of valves—right or left wall when facing. (If other than Fiat valves and showerhead are to be used give complete details for drilling.)

SHOWER DOORS

The standard size (24″x72″ door) is built to fit an opening 24 inches by 72 inches. All other opening sizes require a specially built door.

When ordering a door, state the size of the opening, model, hinging (either right or left when facing), and whether for tile, structural glass, marble or Fiat Shower.

FREIGHT RATE CLASSIFICATION LCL

Shower Doors—1st Class, Receptors and Cabinet Walls—3rd Class.

Prices subject to change without notice.

Clerical errors subject to correction.

All prices and agreements are contingent upon strikes, accidents, and other causes unavoidable or beyond our control.

Goods proven to be defective will be replaced, but no claims for damages incurred or for work done thereon will be allowed.

Manufacturer's responsibility ceases upon delivery of shipment to carrier. Consignee to file claim against carrier for all goods damaged in transit.

ARCHITECT'S SPECIFICATIONS

DESIGN NO. 1—ADMIRAL. Furnish and install as shown on plans Fiat Design No. 1 Admiral Shower Compartment, size ( ), complete with a pre-cast Terrazzo receptor. Chromium plated brass drain connection (with removable strainer plate) to be cast integral with receptor. Walls and top of compartment to be of No. 16 gauge Armco Ingot Iron finished in (white) vitreous (porcelain) enamel. Hollow metal door frames to be of No. 16 gauge galvannealed steel finished in baked on synthetic enamel to match interior.

DESIGN NO. 2A—ADMIRAL. Furnish and install as shown on plans Fiat Design No. 2A Admiral Shower Compartment, size ( ), complete with a pre-cast Terrazzo receptor. Chromium plated brass drain connection (with removable strainer plate) to be cast integral with receptor. Walls and top of compartment to be of No. 16 gauge Armco Ingot Iron finished in (white) vitreous (porcelain) enamel. *Hollow metal door frames to be finished inside and out in vitreous (porcelain) enamel.*

DESIGN NO. 3—CORNER ADMIRAL. Furnish and install as shown on plans Fiat Design No. 3 Corner Admiral Shower Compartment, size ( ), complete with a pre-cast Terrazzo receptor. Chromium plated brass drain connection (with removable strainer plate) to be cast integral with receptor. Walls and top of compartment to be of No. 16 gauge Armco Ingot Iron finished in (white) vitreous (porcelain) enamel. Hollow metal door frames to be of No. 16 gauge galvannealed steel finished in baked on synthetic enamel to match interior.

DESIGN NO. 3A—CORNER ADMIRAL. Furnish and install as shown on plans Fiat Design No. 3A Corner Admiral Shower Compartment, size ( ), complete with a pre-cast Terrazzo receptor. Chromium plated brass drain connection (with removable strainer plate) to be cast integral with receptor. Walls and top of compartment to be of No. 16 gauge Armco Ingot Iron finished in (white) vitreous (porcelain) enamel. *Hollow metal door frames to be finished inside and out in vitreous (porcelain) enamel.*

DESIGN NO. 3B—CHROME STILE CORNER ADMIRAL. Furnish and install as shown on plans Fiat Design No. 3B Chrome Stile Corner Admiral Shower Compartment, size ( ), complete with a pre-cast Terrazzo receptor. Chromium plated brass drain connection (with removable strainer plate) to be cast integrgal with receptor. Walls and top of compartment to be of No. 16 gauge Armco Ingot Iron finished in (white) vitreous porcelain enamel. *Door frames to be extruded brass, chromium plated, with fronts inset to permit tiling.*

DESIGN NO. 3C—ALUMINUM STILE CORNER ADMIRAL. Specifications are the same as for Design No. 3B except that the door frames are to be extruded aluminum alloy finished in "Alumilite," with fronts inset to permit tiling.

DESIGN NO. 4B—CHROME STILE ADMIRAL. Furnish and install as shown on plans Fiat Design No. 4B Chrome Stile Admiral Shower Compartment, size ( ), complete with a pre-cast Terrazzo receptor. Chromium plated brass drain connection (with removable strainer plate) to be cast integral with receptor. Walls and top of compartment to be of No. 16 gauge Armco Ingot Iron finished in (white) vitreous (porcelain) enamel. *Door frames to be extruded brass, chromium plated, with fronts inset to permit tiling.*

DESIGN NO. 4C—ALUMINUM STILE ADMIRAL. Specifications are the same as for Design No. 4B except that the door frames are to be extruded aluminum alloy finished in "Alumilite," with fronts inset to permit tiling.

DESIGN NO. 6—ENSIGN. Furnish and install as shown on plans Fiat Design No. 6 Ensign Shower Compartment, size ( ), complete with a pre-cast Terrazzo receptor. Chromium plated brass drain connection (with removable strainer plate) to be cast integral with receptor. Walls and top of compartment to be of No. 16 gauge rust-proofed galvannealed steel finished in (white) baked on synthetic enamel. Door frames to be of hollow metal construction.

DESIGN NO. 8—CORNER ENSIGN. Furnish and install as shown on plans Fiat No. 8 Corner Ensign Shower Compartment, size ( ), complete with a pre-cast Terrazzo receptor. Chromium plated brass drain connection (with removable strainer plate) to be cast integral with receptor. Walls and top of compartment to be of No. 16 gauge rust-proofed galvannealed steel finished in (white) baked on synthetic enamel. Door frames to be of hollow metal construction.

DESIGN NO. 8B—CORNER CHROME STILE ENSIGN. Furnish and install as shown on plans Fiat Design No. 8B Corner Chrome Stile Ensign Shower Compartment, size ( ), complete with a pre-cast Terrazzo receptor. Chromium plated brass drain connection (with removable strainer plate) to be cast integral with receptor. Walls and top of compartment to be of No. 16 gauge rust-proofed galvannealed steel finished in (white) baked on enamel. *Door frames to be extruded brass, chromium plated, with fronts inset to permit tiling.*

DESIGN NO. 8C—CORNER ALUMINUM STILE ENSIGN. Specifications are the same as for Design No. 8B except that the door frames are to be extruded aluminum alloy finished in "Alumilite," with fronts inset to permit tiling.

DESIGN NO. 9B—CHROME STILE ENSIGN. Furnish and install as shown on plans Fiat Design No. 9B Chrome Stile Ensign Shower Compartment, size ( ), complete with a pre-cast Terrazzo receptor. Chromium plated brass drain connection (with removable strainer plate) to be cast integral with receptor. Walls and top of compartment to be of No. 16 gauge rust-proofed galvannealed steel finished in (white) baked on synthetic enamel. *Door frames to be extruded brass, chromium plated, with fronts inset to permit tiling.*

DESIGN NO. 9C—ALUMINUM STILE ENSIGN. Specifications are the same as for Design No. 9B except that the door frames are to be extruded aluminum alloy finished in "Alumilite," with fronts inset to permit tiling.

DESIGN NO. 12—WARRANT. Furnish and install as shown on plans Fiat Design No. 12 Warrant Shower Compartment, size ( ), complete with a pre-cast Carbotex receptor. Chromium plated brass drain connection (with removable strainer plate) to be cast integral with receptor. Walls (no top) to be of No. 16 gauge rust-proofed galvannealed steel finished in (white) baked on synthetic enamel. Door frames to be of hollow metal construction.

DESIGN NO. 14—CORNER WARRANT. Furnish and install as shown on plans Fiat Design No. 14 Corner Warrant Shower Compartment, size ( ), complete with a pre-cast Carbotex receptor. Chromium plated brass drain connection (with removable strainer plate) to be cast integral with receptor. Walls (no top) to be of No. 16 gauge rust-proofed galvannealed steel finished in (white) baked on synthetic enamel. Door frames to be of hollow metal construction.

DESIGN NO. 15—MARINE. Furnish and install as shown on plans Fiat Design No. 15 Marine Shower Compartment, size ( ), complete with a pre-cast Stonetex receptor. Chromium plated brass drain connection (with removable strainer plate) to be cast integral with receptor. Walls (no top) to be of No. 18 gauge rust-proofed galvannealed steel finished in a light green baked on synthetic enamel.

DESIGN NO. 16—CORNER MARINE. Furnish and install as shown on plans Fiat Design No. 16 Corner Marine Shower Compartment, size 36" x 36", complete with a pre-cast Stonetex receptor. Chromium plated brass drain connection (with removable strainer plate) to be cast integral with receptor. Walls (no top) to be of No. 18 gauge rust-proofed galvannealed steel finished in a light green baked on synthetic enamel.

DESIGN NO. 17— SKIPPER. Furnish and install as shown on plans Fiat Design No. 17 Skipper Shower Compartment, size ( ), complete with pre-cast (flat type) Stonetex receptor. Chromium plated brass drain connection (with removable strainer plate) to be cast integral with receptor. Walls of compartment to be of No. 18 gauge galvanized steel.

Note: Valves and shower head intentionally omitted from specifications—see pages 14 and 15

THE IDENTIFICATION OF A QUALITY LINE

Fiat
METAL MFG. CO.

MANUFACTURERS

of

SHOWER BATH CABINETS

SHOWER DOORS

GLASS BATH TUB ENCLOSURES

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THE HIMMEL BROTHERS CO.

Manufacturers of Shower Doors and Shields

1409-15 Dixwell Avenue, NEW HAVEN, CONN.

"HIMCO" EXTRUDED SHOWER DOORS AND SHIELDS

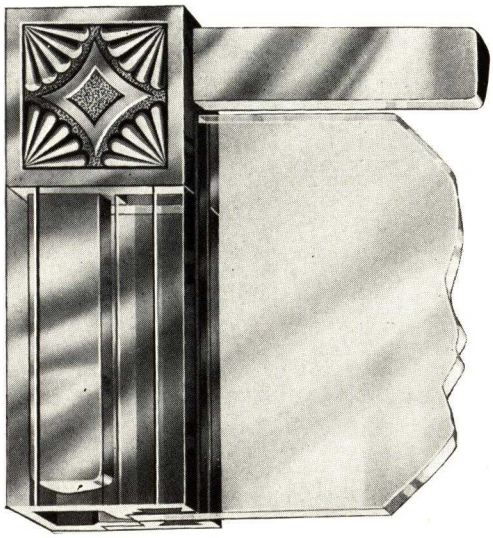
Sag-proof **Water-proof** **Crack-proof**

Based on "Himco" Patented Principle of Extruded Store Front Construction—Real custom built construction at a reasonable price. Heavy 10-gauge extruded bronze, heavily chromium plated.

Doors Are Sag-proof—Heavy extruded members are reinforced with mechanically forged, decorated corner angles, adding stiffness and preventing twisting or weaving of door.

Doors Are Water-proof—Special grooved shaped rubber packing is used on edge of jambs, and takes up any inequalities. A continuous piano hinge used on door has a wide lap on the latch side. Bottom of door is protected by a heavy rubber guard, which fits snugly against the sloped curb of enclosure or top of tub. A metal drip also carries back any water from face of door. The rubber guard is easily replaced by unscrewing the metal drip.

Glass Is Crack-proof—It is set in our patented extruded System No. 400 line rubber cushion construction, which allows glass to expand and contract, and takes up jars and shocks. In case glass is broken by accident, it is readily removed by simply unscrewing the cover mould on inside of door.



Patented

Illustration of the forged brass corner reinforcement showing one end in frame in phantom and one end exposed

Ventilating the Enclosure—In the single door to a shower stall, the grille is placed in top of door. In the enclosures over tub, the grille is carried to ceiling and is fixed; bottom of grille acts as a transom over door.

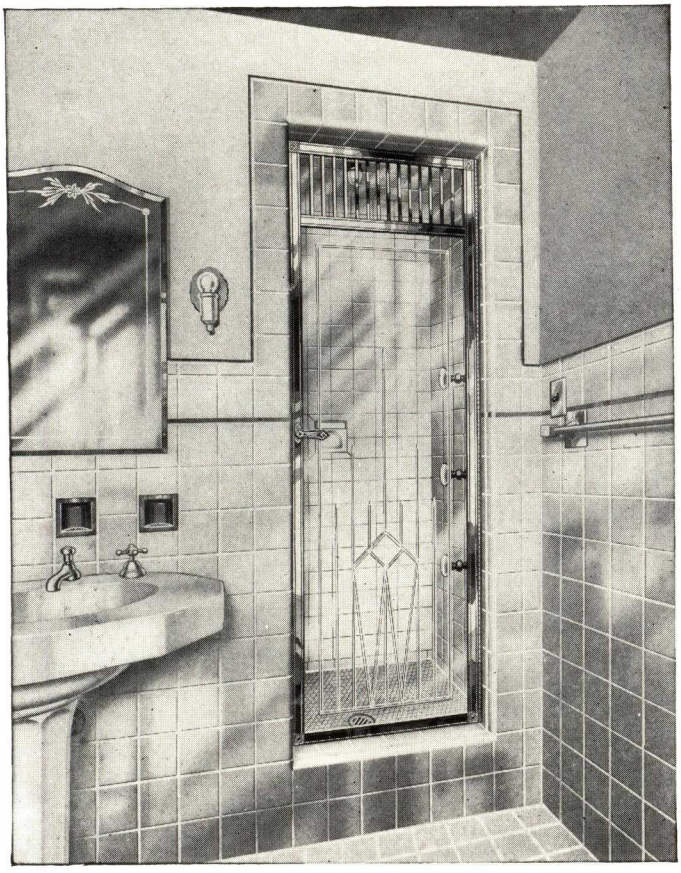
Standard sizes of "Himco" Shower Stall Doors:

24 in. x 72 in.	24 in. x 78 in.
26 in. x 72 in.	26 in. x 78 in.
28 in. x 72 in.	28 in. x 78 in.

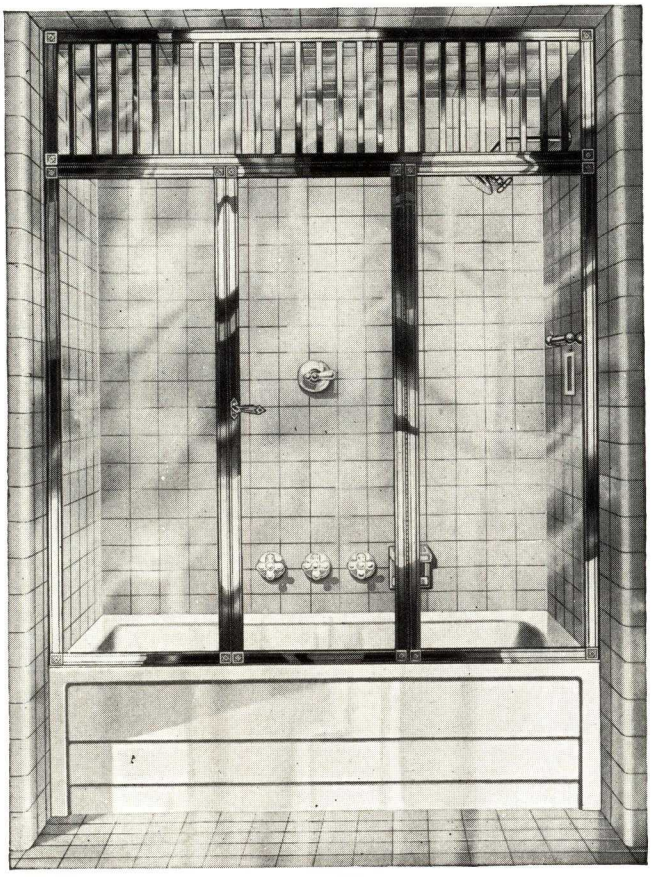
Other sizes will be made to order.

"Himco" Three Panel Glasss Enclosure—For recessed tub showers, can be obtained with one section stationary and two sections to serve as doors, or with two sections stationary and one section to serve as door. Can be built to any dimensions required. Length of tub ordinarily determines width of enclosure. Quotations submitted for etched or special glass, special finishes, or other special requirements.

Hardware and Finish—Entire door and enclosure is finished in heavy chromium plated finish. Hardware designed especially for doors. Doors and stationary panels are glazed with the finest quality clear polished plate glass.



Patented



Patented

G. M. KETCHAM MFG. CORP.

Manufacturers of Shower Doors, Bathtub Enclosures, Medicine Cabinets

TELEPHONE
TRiangle 5-6306

81 Washington Street, BROOKLYN, N. Y.

BRANCH OFFICES

PHILADELPHIA, PA., 2402 Market St.—Telephone, Rittenhouse 5886 WASHINGTON, D.C., First and K Sts., N. E.—Telephone, Metropolitan 4685

SALES REPRESENTATIVES

BOSTON, MASS., A. Taylor Kennedy, 575 Albany St.
MIAMI BEACH, FLA., Patrick Mooney, Monterey Apartments, 1611 Michigan Ave.

SAMPLES ALSO DISPLAYED IN

NEW YORK, N. Y., Architects' Sample Corporation, 101 Park Ave. PHILADELPHIA, PA., Architects Exhibit, 17th and Samson Sts.

Neo Angle Tub Enclosure
Plate 8A and 8C

SHOWER STALL DOORS

A Construction

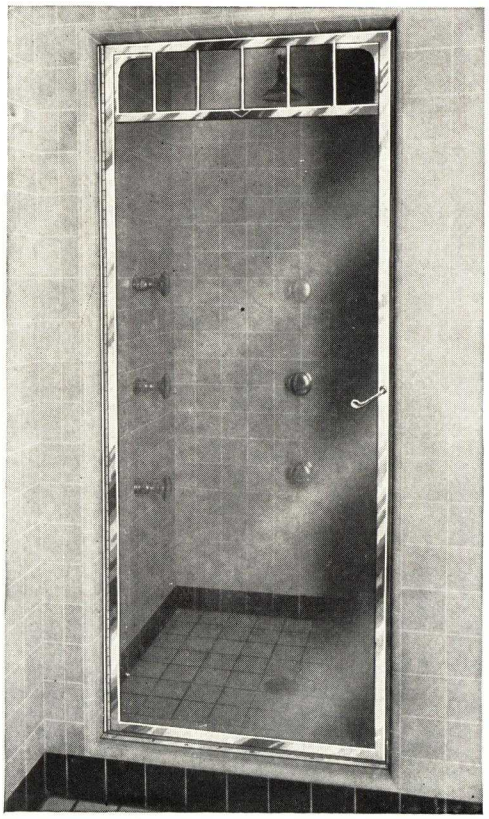
Solid extruded brass jambs and frames, ¼-in. polished plate glass; extra heavy 14-gauge piano hinge. All metal parts chromium plated.

C Construction

Heavy 14-gauge channel bronze frames; piano hinge 17-gauge brass, $\frac{7}{32}$-in. crystal glass. All metal parts chromium plated.

This construction, though differing in weight details and cost, is similar in appearance and operation.

Model A doors have our patented adjustable jamb feature.



Shower Stall Door
Models A and C

ENCLOSURES

Neo Angle Tub Enclosure

Consists of two doors and a stationary grille above. An ideal arrangement for this new tub.

Bathtub Shower Enclosure

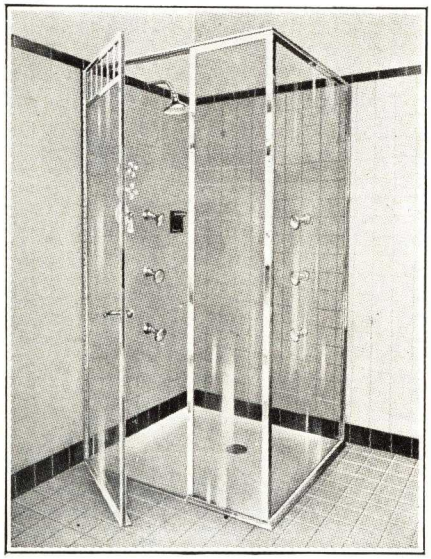
Represents an ideal arrangement where tub is recessed between two walls. Constructed so as to consist of two panels extending from each wall which can be of any desired size, and a door in the middle.

Corner Shower Enclosure

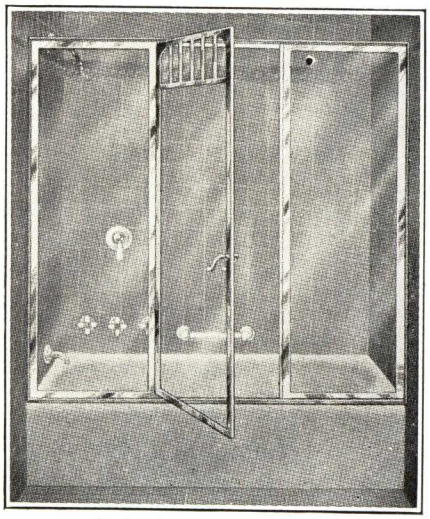
A practical enclosure affording means of saving space and of obtaining an extremely light shower stall.

Illustration shows enclosure placed upon a receptor. We can also construct same to fit over a tile base.

Complete Catalogue Furnished on Request



Corner Shower Enclosure
Plate 7A and 7C



Bathtub Shower Enclosure
Plate 2A and 2C

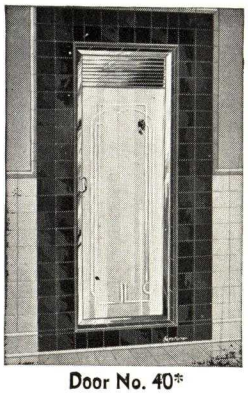
KEYSTONE SHOWER DOOR CO.

Manufacturers and Designers of Shower Doors and Bathtub Enclosures

3550-3552 North 16th Street

PHILADELPHIA. PA.

AGENTS IN PRINCIPAL CITIES



Door No. 40*

Enclosure No. 230†

Enclosure No. 240†

MATERIALS—MODELS

Our products are divided into three separate and distinct classes as follows:

Reserve Model, Standard Model, De Luxe Model.

The metal entering into the construction of all models consists entirely of composition bronze and brass. All channels, angles and special shapes are extruded through dies, insuring evenness and uniformity in the process of manufacture. All screws and other fastenings are made of brass. No iron or steel is used in any part of our shower doors or bath enclosures, thus eliminating any possible chance of corrosion or stain on the chromium finish through oxidation.

The packing used for the installation of glass is composed of mineral and vegetable compounds of great durability, does not deteriorate with age, and will not disintegrate under water pressure. The glass is installed in the channel frames packed under pressure to insure a watertight fit.

Each structure is highly polished and chromium plated, making a beautiful finish impervious to water.

SPECIFICATIONS

Reserve Model—This consists of 1-inch special extruded channel frames with mortise and tenon joints, and angle return full length piano hinge, also metal drip apron. These doors are made with or without grill at top, or with scroll ornaments and urn, all as illustrated. Thickness of glass is $\frac{7}{32}$-inch plate.

Standard Model—This construction consists of 1-inch special extruded channel frames with miter joints securely fastened at corners with brass countersunk screws. Also full length hinge and angle combination, and metal drip apron. These doors are made with or without grill at top, or with scroll ornaments and urn. Thickness of glass is ¼-inch "polished plate."

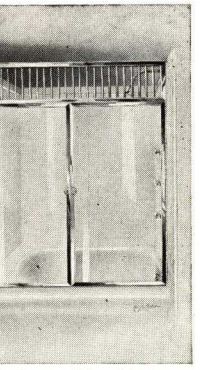
The separate shower or bathtub enclosures consisting of door and one or more panels are fitted with adjustment channels to compensate for walls built out of plumb.

De Luxe Model—This consists of 1¼-inch special extruded channel frames with mitered joints securely fastened at corners with brass countersunk screws. Special features of the De Luxe construction are channel and chair shapes for adjustment to irregular walls; baffle fittings and aprons with curled drip to shed the water inward into stall or tub. These doors are glazed with ¼-inch mirror quality plate glass.

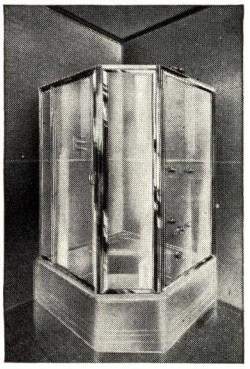
CRAFTSMANSHIP

We specialize in the manufacturing of shower doors, tub enclosures and stall enclosures; thus we are able to give you the utmost in design, material and craftmanship. Every feature of our products has been carefully proven for design, strength and durability.

Each order is given individual attention and is custom-made to suit required specifications. This insures a perfect installation, beautifully executed and structurally sound.



Enclosure No. 110†



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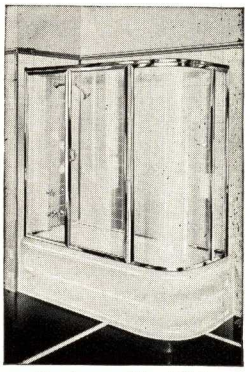

Enclosure No. 160‡

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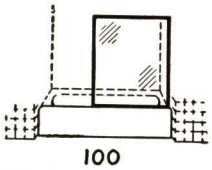

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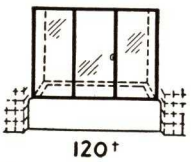

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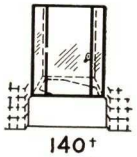

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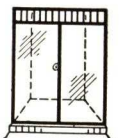
150†

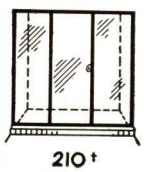


200†

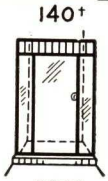
ARCHITECTURAL SERVICE

We maintain an Architectural Department so that we may be of further service by sending at your request detailed prints on any type of installation required.

Our engineers have had many years' experience in our line and are glad to give you the benefit of their knowledge in construction and layout. We solicit inquiries.



210†



220†

† *With or Without Grill*

‡ *Standard and De Luxe Model Only*

* *De Luxe Model Only*

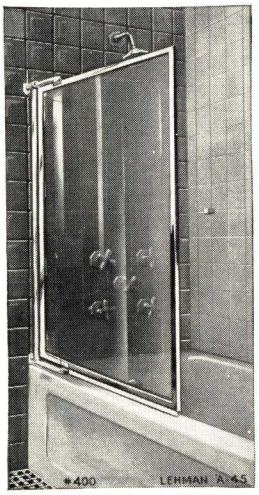
LEHMAN SPRAYSHIELD COMPANY

Shower Bath Doors—Sprayshields—Enclosures—Receptors

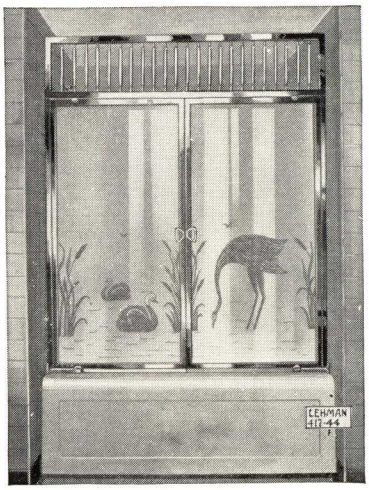
2514-2518 North Broad Street, PHILADELPHIA, PA.

REPRESENTATIVES IN

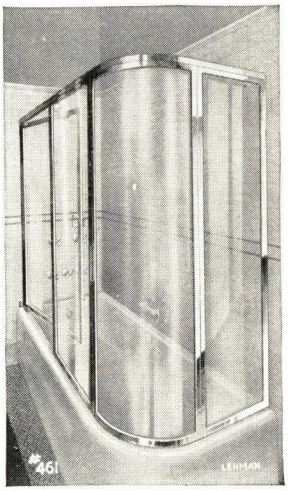
ALBANY, ATLANTA, BALTIMORE, BATTLE CREEK, BOSTON, BRIDGEPORT, BUFFALO, CHARLOTTE, CHICAGO, CINCINNATI, CLEVELAND, COLUMBUS, DALLAS, DENVER, DETROIT, HOUSTON, INDIANAPOLIS, KANSAS CITY, LITTLE ROCK, LOS ANGELES, MIAMI, MILWAUKEE, MINNEAPOLIS, NEWARK, NEW ORLEANS, NEW YORK, OKLAHOMA CITY, OMAHA, PITTSBURGH, PORTLAND, ORE., RICHMOND, SEATTLE, SPOKANE, ST. LOUIS, SAN FRANCISCO, WASHINGTON



No. 400 Sprayshield
Swings in clearing valves also opens outward



No. 412-44 Sprayshield
Without grille is like No. 402 and No. 412. Shown with glass No. 702 and 704



No. 461 Enclosure
For round corner tub with curved glass and frame

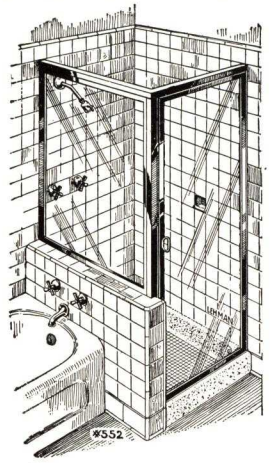
No. 843 Enclosure
For neo-angle bath
Write for special catalog

Custom Built for Perfect Fitting

Lehman Shower Enclosures are immaculate, sanitary, efficient, practical and economical. They bring comfort, beauty, and water protection to the bathroom without the expense of laundering and replacing mildewed curtains. They are built for durability without stinting on materials—no substitution of crystal as plate glass. Every door, sprayshield and compartment is made for its individual bathroom, for erection in new or old buildings.

Superior Design, Craftsmanship, Materials

Lehman equipment is built up to a standard to merit the continued confidence of architects and responsible contractors. It is not skimped down to a price for bargain hunters. Exclusive features, such as the hidden monosleeve hinge, vertical adjustment to compensate for building settlement, telescoping jambs and aprons, free floating roller catch, inward swinging of sprayshields, are covered by 23 patents and are the result of 15 years' research and specialization. Special fittings for attachment to marble and structural glass. Our process of pressure-pad glazing protects glass from contact with bronze, and provides for expansion and contraction. Every Lehman Enclosure bears our name and is fully guaranteed.



No. 552 Glass Enclosure
No. 1 door and side, shown on Lehman Terrazzo Receptor with low tile buttress

Solid Bronze for Durability

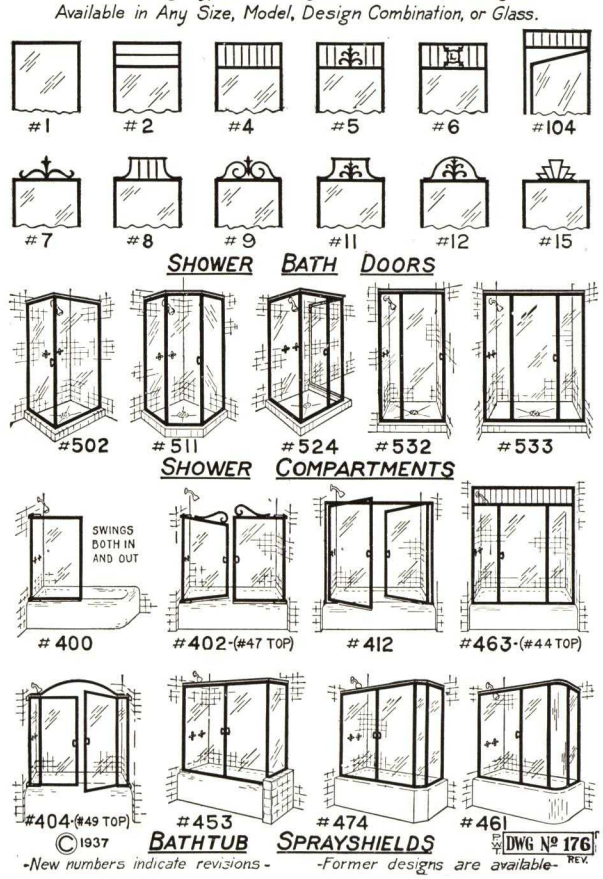
No thin tubing or flimsy construction. 1¼ to 2 lbs. of bronze per lineal foot of Lehman glazing frame. Grille spindles are ½-in. solid rod, lathe tapered. Screws are extra strength alloys.

Terrazzo Shower Receptors

Our artificial art stone shower bases are monolithic reinforced cement, beautifully finished—durable—economical. Chromium strainer. Bronze drain for 2 in. waste, cast integral. One, two or three sides may be embedded in wall, with other sides ready for our glass doors and side panels. Any color or size furnished, rectangular or with diagonal or round corners. Popular sizes carried in stock.

LEHMAN SHOWER BATH ENCLOSURES

Chart Showing Typical Arrangements and Top Designs. Available in Any Size, Model, Design Combination, or Glass.



-New numbers indicate revisions- *-Former designs are available-*

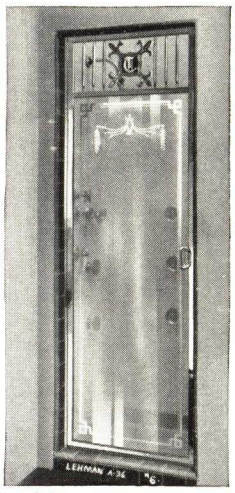
Swan, Mermaid, Gem, models are similar in appearance and operation. All items custom made, any design, fully guaranteed. Clear glass and polished chromium are standard, but decorated glass and gold or other plating can be furnished. We reserve right to modify construction details.

Lehman Bathtub Sprayshields Swing In and Out

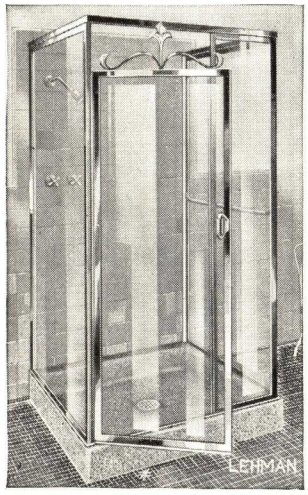
Only Lehman Patent Sprayshields swing inward over bathtubs, with clearance for the valves, out of the way when not in use. Also swing outward, providing full access for tub bathing and cleaning. With Lehman equipment any built-in tub serves also as a shower compartment, bringing the freshness of sparkling glass and chromium instead of the sogginess of "Bathing in a Tent."

Shower Bath Doors with Hidden Hinge

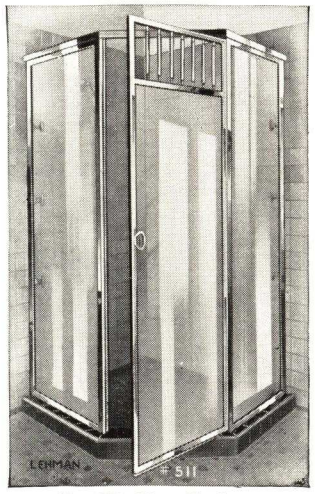
Lehman doors are custom built, insuring watertight fitting, and permitting a wide selection of ornamental designs of metal and glass, yet they cost no more than ordinary doors and reduce installing expense. Only Lehman doors are adjustable vertically. The full length bronze monosleeve hinges are integral with door frames, and eliminate objectionable screws and crevices.



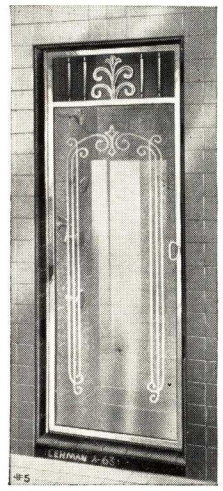
No. 6 Door—Monogram Grille
Solid bronze tapered spindles. Glass design No. 706 shown



No. 524 Glass Enclosure
Shown with No. 7 door and erected on a Lehman Terrazzo Receptor



No. 511 Glass Enclosure
No. 4 door and tile receptor shown. Crystal made compartments any size



No. 5 Shower Door
Ornamented ventilator grille. Glass design No. 718 shown

Lehman Crystal Shower Compartments

Glass enclosures increase the usable area of bathrooms, eliminating bulky darkening partitions, and reducing construction costs. Being made to measure, they can be fitted into any available nook, and they make extra bathrooms practical in very limited spaces—ideal for modernization. They are erected after tiling. Panels shipped glazed ready for erection.

Sprayshield Construction—Sprayshields are installed after fixtures and tile, without drilling the bathtub. Sturdy bronze brackets are attached to the wall, but all weight rests on the tub. Sprayshields hang inside the drainage line of the tub rim with a renewable rubber seal to close the joint. Stop bumpers and a friction catch regulate the swinging.

Standard single shields for 30-in. wide bathtubs: No. 400 Gem Sprayshield approx. 31 in. wide, 50 in. high. No. 400 Swan and Mermaid approx. 32 in. wide, 50 in. high.

Door Construction—Most Lehman doors are reversible, right or left, finished both inside and outside. Standard fittings are for attachment to tile. Fittings for marble or structural glass when ordered. Telescoping drainage apron. Latch is special free floating roller. Doors regularly open outward. Special jambs, aprons, saddles and gutters for all room conditions. Sill should drain inward ⅜ in. Build your doorway reasonably square, and send us finished dimensions. Made any size, but standard size fits 24x72 in. finished clear doorway.

Choice of Models

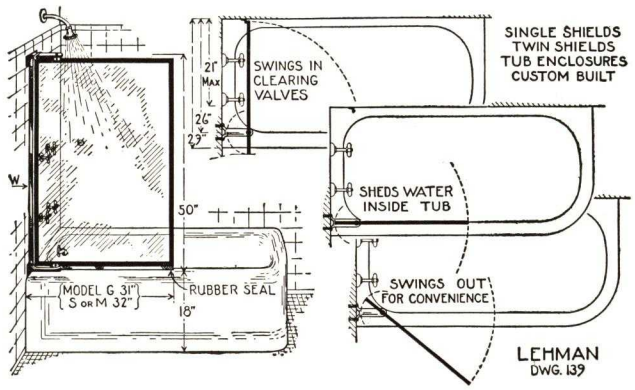
Swan—Extra heavy frame—¼ in., 52-oz. select plate glass.
Doors: Monosleeve hinge, adjustable jambs. 51 lbs. metal.*
Sprayshields: Spacing bar to connect brackets. 30 lbs.†

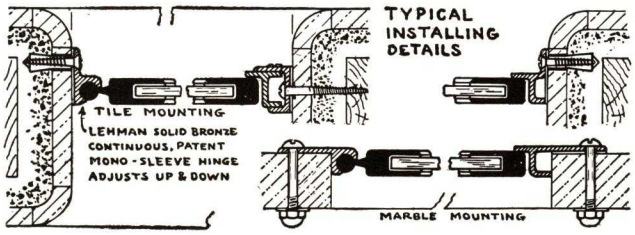
Mermaid—Bronze frame—¼ in., 52-oz. polished plate glass.
Doors: Monosleeve hinge, adjustable jambs, 45 lbs. metal.*
Sprayshields: Spacing bar to connect brackets. 25 lbs.†

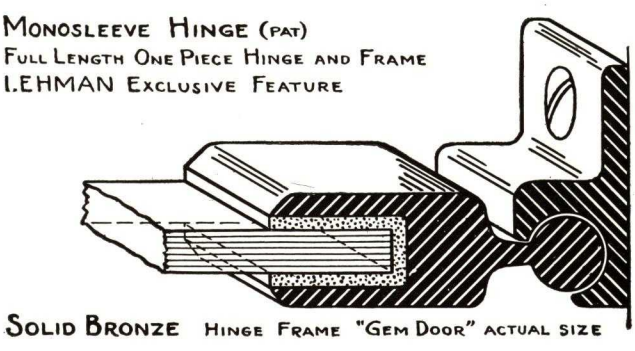
Gem—Bronze frame—$\frac{7}{32}$ in., 46-oz. selected crystal glass.
Doors: Patent monosleeve hinge, plain jambs. 39 lbs.*
Sprayshields: Solid bronze brackets, 20 lbs. metal.†

Viking—Bronze frame—$\frac{7}{32}$ in., 46-oz. selected crystal glass.
Doors: Special piano hinge, made for tile only. 33 lbs.*

* *Average weight of metal in door 24x72 in. with No. 4 grille.*
† *Average weight of metal in No. 400 sprayshield standard size.*



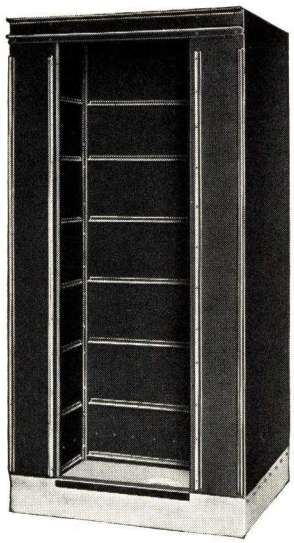




FRED H. LEWIS COMPANY

43 East Ohio Street, CHICAGO, ILL.

LEWIS SHOWER BATH CASINGS



Lewis Shower Bath Casing
As installed by plumbing contractor

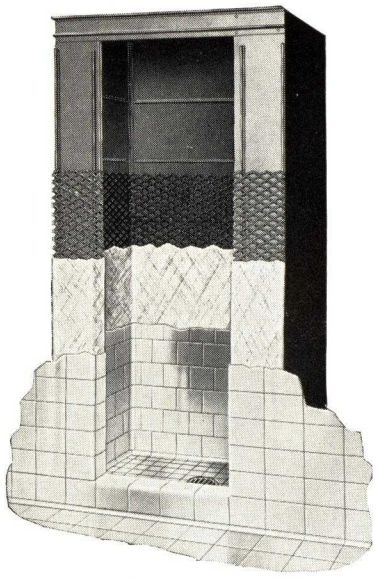
Lewis Shower Bath Casings provide a dependable and positive, leakproof method of building shower compartments with tile, Vitrolite, Carrara glass, marble or other kindred wall and floor facings.

The Lewis Casing is of knocked down construction which simplifies handling and installation. When assembled it presents a rigid, leakproof unit. It is installed on the rough floor but not fastened to the floor or surrounding walls. It simply rides the building—hence does not subject wall facings of the shower to any strain as a result of shrinkage of joists and studs, vibration or settlement of the building.

STANDARD SIZES—REGULAR MODEL CASINGS

Casing size, in.	Outside of casing, in.		Approx. finished dimension of tile compartment, in.	
	Width	Depth	Width	Depth
36x36	36	36	33	32
36x42	36	42	33	38
39x40	39	40	36	36
42x36	42	36	39	32
42x42	42	42	39	38
45x46	45	46	42	42
48x36	48	36	45	32
48x42	48	42	45	38
48x48	48	48	45	44
54x42	54	42	51	38
60x48	60	48	57	44

Over-all height of all sizes 84 in.



Lewis Shower Bath Casing
Showing stages in construction of tile shower compartment

Details

Material—Pan is of rigid, hard tempered sheet zinc. Walls and furring are of 18-gauge sheet steel coated inside and out with mineral asphalt.

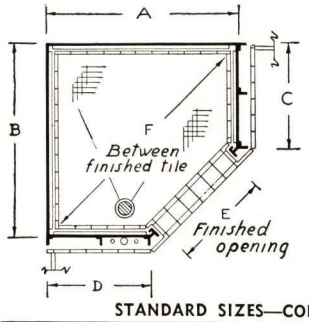
Perforated Furring Angles—Spot welded to walls and pilasters, provide anchorage for metal lath and hold lath ⅜ in. away from casing walls to insure strong mortar bond. Can be furnished with outside wall furred for corner installation.

Waste Connection—For double drainage drain with clamping device—see list below.

Doors—Made especially for use with Lewis Casings can be furnished. Casings provide for 24x72-in. finished tile door opening.

Open Top—Permits continuation of compartment walls to room height, providing adequate "breathing space" for bather. Separate lath is attached to studs above top of casing. This prevents strains in finished walls of the compartment.

Installation—Made by plumbing contractor. Casings do not change specifications for any other trade.



Corner Entrance Casings

Furring on outside of corner entrance model provides space for supplies and valves. When corner entrance casings are installed to extend into the bathroom the space above the casing to room ceiling is left open.

STANDARD SIZES—CORNER ENTRANCE CASINGS

Casing size, in.	Dimensions, in.						Over-all height, in.
	A	B	C	D	E	F	
42x42	42	42	21	21	24	55	84
45x45	45	45	24	24	24	58	84
48x48	48	48	26	26	26	63	84

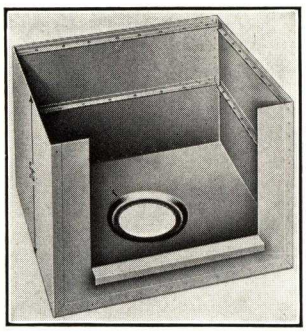
Drains

Any drain listed below can be used with Lewis Casings or Pans.

Fleming Drains	Josam Drains
F-40 Series—any drain F-50 Series—any drain F-60 Series—any drain F-70 Series—any drain F-80 Series—any drain	300 Series—Nos. 352 to 383, inclusive 300R Series—Nos. 353R to 373R, inclusive Any combined shower drain and trap which takes a plated brass strainer.

2-in. bottom outlet drain with clamping ring and chromium plated strainer can be furnished with casings or pans if desired.
Note: Clamping ring *must* be used.

Lewis Prefabricated Shower Pan



An inexpensive, watertight, factory made pan for roughing-in shower compartments of tile, etc.

Eliminates the uncertainties of "made on the job" pans.

24 ins. high.

Made of hard tempered sheet zinc.

Furring angles stiffen pan and provide anchorage for metal lath.

STANDARD SIZES—PANS

Pan size, in.	Width, in.	Depth, in.	Height, in.
36x36	36	36	24
36x42	36	42	24
39x39	39	39	24
42x36	42	36	24
42x42	42	42	24

Special sizes up to 48 x 48 in. at slight extra cost.

MILWAUKEE STAMPING COMPANY

Bathe-Rite Shower Cabinets

MILWAUKEE, WIS.

CHICAGO OFFICE, 150 No. Wacker Drive—Telephone: Randolph 4227-28 NEW YORK OFFICE, 101 Park Avenue—Telephone: CAledonia 5-9349
REPRESENTATIVES IN ALL PRINCIPAL CITIES

For Milwaukee Stamping Company's Toilet Partitions and Builders Hardware, see File Index

SHOWER BATH CABINETS

Bathe-Rite Shower Cabinets are complete units designed and constructed to be absolutely watertight and leakproof, and can be used singly or in batteries.

Shower units should be placed in plumbing specifications.

Receptors

Terrazzo Receptors—Made with best grade fine marble chips and finest cement, precast with cross-laced steel reinforcement. Receptor is ground and hand polished, providing an attractive finish. All receptors are treated to be slip-proof and resistant to water, acid, alkali, and grease. Construction provides superior watertight qualities and easy assembly. Drain is in exact center of receptor.

Ferrostone Receptors—More economical in cost than terrazzo but have the same non-slip, leak-proof qualities. Ferrostone is a cement composition mixed with limestone chips and specially treated to be waterproof. Resists acid, alkali, and grease. Standard color is light green, but can be furnished in colors to suit requirements.

Vitreous Enamel (Porcelain) Receptors—Made of armco iron welded to make one-piece construction throughout. Enamel is smooth surface black outside and green on black inside. Floor has non-slip surface. Base anchoring frame of galvanealed steel in baked black enamel finish fastens to floor. The receptor proper is fastened to base frame with two screws. Receptor has tapped bushings in sides for attaching walls to receptor with brass machine screws. Receptors in colored finishes can be furnished at slight extra cost and with time allowance for manufacture.

Metal Receptor—A one-piece construction made with bottom frame, eliminating filling or grouting under the cabinet. Bottom slopes to drain, insuring easy drainage. Standard drain is centered in bottom, but can be located as desired. Drain should not be placed nearer than 6 in. to side of cabinet.

Walls

Walls for all models, except B and K, are of knockdown construction. Walls come in three sections with joints only at rear in right and left-hand corners. Joints are wedge type and made tight by brass machine screws drawn up securely. Connection of walls to receptors by means of brass machine screws insuring watertight assembled cabinet. All connections from inside of cabinet. Connections are leak-proof. Gauge and type of metal varies with models.

Equipment and Accessories

Each unit is furnished with all parts necessary to make complete installation. 1-in. brass chrome plated curtain rod, brass chrome plated soap dish, and brass chrome plated strainer for 2-in. pipe are supplied with each unit. In addition, suitable valves, shower head and curtain are regularly supplied unless special types are desired and specified. Cabinets can be furnished with drilling for any type valves and head if template or drilling dimensions are furnished.

Glass doors or top covers with dome light are available at extra cost on certain models.

Valves and heads have standard locations on sidewalls, based on practical use of cabinets. Shower head should not be located less than 5 ft. 6 in. from floor of receptor, and for use in men's showers only should be several inches higher. Valves and heads should always be located on sidewalls for easy access before entering cabinet.

MODELS B AND K (ONE PIECE)

Recommended Uses—Models B or K are popular priced cabinets recommended especially for hotels, clubs, schools, institutions, plants, hospitals, or wherever sturdiness is desirable and hard wear is predominant.

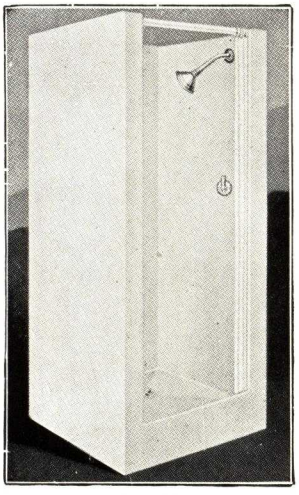
Construction—These models are both completely assembled units of one-piece construction. Walls and receptor are welded into a single leak-proof unit.

Model B is made of copper-bearing rust-resisting steel with walls of 11-gauge, and receptor floor 12-gauge. Receptor floor is galvanized.

Model K is made of Kupraluminum, an aluminum alloy. Walls are 10-gauge B.&S. and receptor floor 8-gauge B.&S.

Both units are furnished in prime finish only, and final finishing is done after installation. Use good grade waterproof enamel.

Equipment — Cabinets come with full equipment unless otherwise specified. Filler plates for joining batteries of cabinets can be furnished at slight extra cost. Specify whether right or left-hand location of valves and shower head. (Face cabinet to designate.)

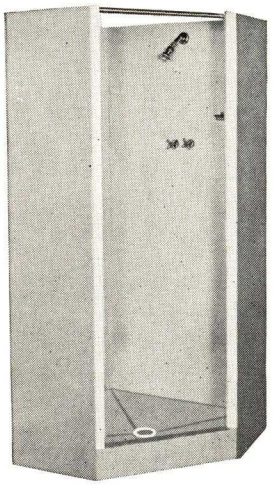


B or K

SPECIFICATIONS

Model	B. or B. C.—Steel				K. or K. C.—Kupraluminum			
Sidewalls	One Piece 11-gauge U. S. copper-bearing steel				One Piece 10-gauge B.&S. aluminum alloy			
Receptor—welded to sidewalls	One Piece 12-gauge U. S. galv. inverted construction, recessed strainer				8-gauge B.&S. aluminum—inverted construction, recessed strainer			
Finish	Baked red prime				Baked aluminum prime			
Sizes and weights	Sizes, inches			Weight, lbs.	Sizes, inches			Weight, lbs.
	W.	D.	H.		W.	D.	H.	
	30	30	72	315	30	30	72	190
	32	32	72	330	32	32	72	205
	36	36	72	365	36	36	72	215

Red oxide prime finish steel baked at 250° F. Aluminum primer used on aluminum cabinets baked at 250° F. Primers are neutral to field coat finish. We recommend finishing after installation.



BC or KC
Corner Model

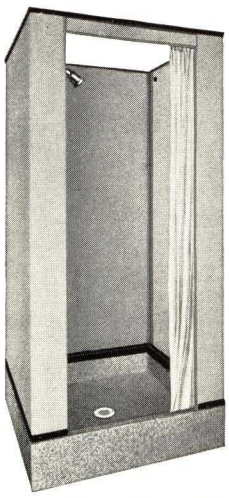
MODELS FT, FF, KT, KF (KNOCKDOWN)

Recommended Uses—All models are unusually high grade design and construction, well adapted for residences, apartments, hotels, clubs, etc., where constant use and lasting quality are of first consideration.

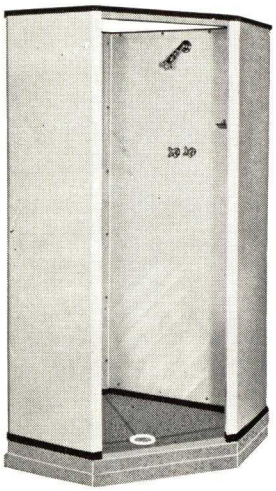
Walls—Models FT, FF, FTC and FFC have 16-gauge galvanealed steel walls. Models KT, KF, KTC and KFC have 14-gauge B.&S. aluminum alloy.

Equipment—Models come completely equipped unless otherwise specified. Special equipment, such as mixing valve, glass door, top and dome light, and filler plates furnished when specified.

Specify whether right or left-handed location of valves and shower head wanted. (Face cabinet to designate.)



FT FF KT KF



FTC FFC KTC KFC
Corner Model

SPECIFICATIONS

Model.....	FT FTC FF FFC				KT KTC KF KFC			
Walls	16-gauge galvanealed steel				14-gauge B.&S. aluminum			
Receptor	FT, FTC, Terrazzo gray and black FF, FFC Ferrostone green				KT, KTC Terrazzo gray and black KF, KFC Ferrostone green			
Finish	Prime or enamel baked on				Prime or enamel baked on			
	Sizes, in.			Weight, lbs.		Sizes, in.		Weight, lbs.
	W.	D.	H.			W.	D.	H.	
FT-FF	32	32	82	570	KT-KF	32	32	82	455
FT-FF	36	36	82	630	KT-KF	36	36	82	510
Corner Style FTC-FFC	36	36	82	550	Corner Style KTC-KFC	36	36	82	435

Primer for steel grey oxide baked to 250° F. Aluminum primer used on all aluminum stalls baked to 250° F. Primers will not bleed through field coat. Finish coat high grade enamel baked at 250° F. will not mar and leaves a smooth sanitary finish. For field coat finish, recommend high grade air drying enamel.

MODELS FV, KV, FVC, KVC (KNOCKDOWN)

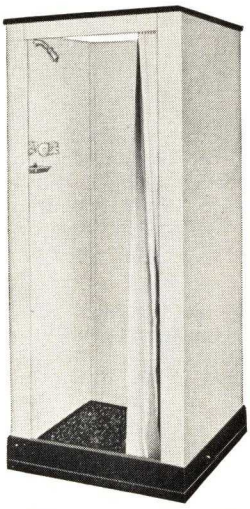
Recommended Uses—All models are unusually high grade design and construction, well adapted for residences, apartments, hotels, clubs, etc., where constant use and lasting quality are of first consideration.

Walls—Models FV and FVC have 16-gauge galvanealed steel walls. Models KV and KVC have 14-gauge B.&S. aluminum alloy.

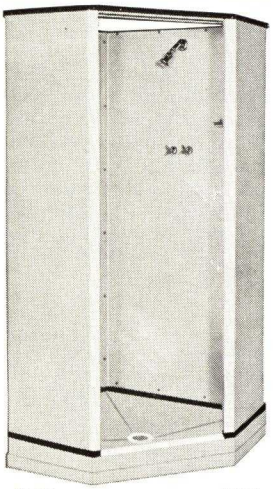
Receptors—All models have vitreous (porcelain) enamel receptors, insuring permanent finish. Special colors available.

Equipment—Models come completely equipped unless otherwise specified. Special equipment, such as mixing valve, glass door, top and dome light, and filler plates furnished when specified.

Specify whether right or left-handed location of valves and shower head wanted. (Face cabinet to designate.)



FV KV



FVC KVC
Corner Model

SPECIFICATIONS

Model	FV FVC				KV KVC			
Walls	16-gauge galvanealed steel				14-gauge B.&S. aluminum			
Receptor	Vitreous enamel black outside, green and black inside				Vitreous enamel black outside, green and black inside			
Finish	Prime or enamel baked on				Prime or enamel baked on			
	Sizes, in.			Weight, lbs.		Sizes, in.		Weight, lbs.
	W.	D.	H.			W.	D.	H.	
FV	30	30	80	270	KV	30	30	80	160
FV	32	32	80	290	KV	32	32	80	175
FV	36	36	80	320	KV	36	36	80	200
Corner Style FVC	36	36	80	320	Corner Style FVC	36	36	80	200

Primer for steel grey oxide baked to 250° F. Aluminum primer used on all aluminum stalls baked to 250° F. Primers will not bleed through field coat. Finish coat high grade enamel baked at 250° F. will not mar and leaves a smooth sanitary finish. For field coat finish, recommend high grade air drying enamel.

MODELS CF, CFC (KNOCKDOWN)

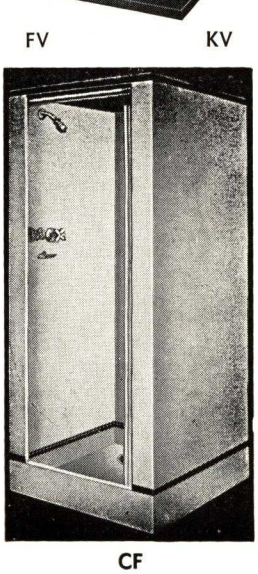
Recommended Uses—A medium priced shower cabinet of practical design for all types of buildings and popular priced homes.

Walls—Of 18-gauge galvanealed steel.

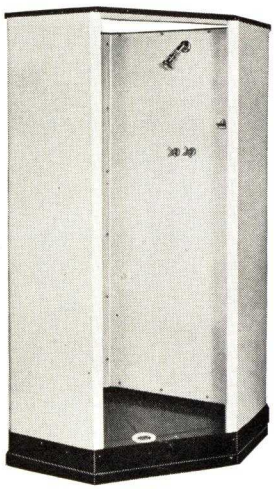
Receptors—Of Ferrostone in green finish.

Equipment—Models come completely equipped unless otherwise specified. Special equipment, such as glass door, mixing valves and filler plates furnished when specified.

Specify whether right or left-hand location of valves and shower head wanted. (Face cabinet to designate.)



CF



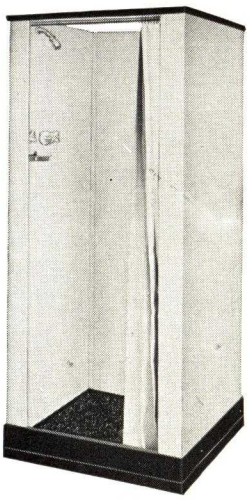
CFC
Corner Model

SPECIFICATIONS

Model	Receptor	Size, in.			Weight, lbs.
		W.	D.	H.	
CF	Ferrostone.....	32	32	78	475
CF	Ferrostone.....	36	36	78	570
CFC	Ferrostone.....	36	36	78	570

Grey oxide primer baked at 250° F. followed with an exceptional high grade baked enamel (at 250° F.) finish, will not chip, mar nor crack.

MODELS CV, CVC (KNOCKDOWN)



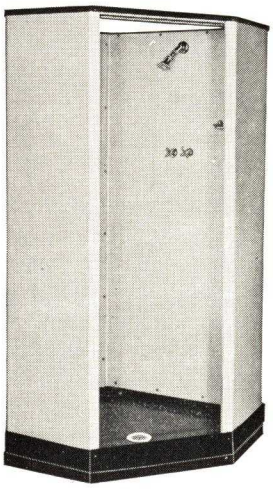
CV

Recommends Uses — A medium priced shower cabinet of practical design for all types of buildings and popular priced homes.

Walls—Made of galvanealed steel. Standard finish—sea foam green; white or special colors furnished if desired.

Receptors—Vitreous enamel (porcelain), black outside and green on black inside. Made of 14-gauge armco iron.

Equipment—Models come completely equipped unless otherwise specified. Specify whether right or left-hand location of valves and shower head wanted. (Face cabinet to designate.)



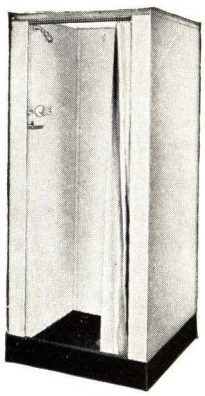
CVC
Corner Model

SPECIFICATIONS

Model	Walls	Receptor	Size, in.			Weight, lbs.
			W.	D.	H.	
CV	18-gauge	Vitreous enamel.....	30	30	76	190
CV	18-gauge	Vitreous enamel.....	32	32	76	250
CV	18-gauge	Vitreous enamel.....	36	36	76	280
Corner Entrance Model CVC	18-gauge	Vitreous enamel.....	36	36	76	280

Grey oxide primer baked at 250° F. followed with an exceptional high grade baked enamel (at 250° F.) finish, will not chip, mar nor crack.

MODEL D (KNOCKDOWN)



D

Recommended Uses — A popular priced shower cabinet for clubs, hotels, camps, low priced residences, summer homes and wherever convenient, low priced bathing facilities are desirable.

Walls — Made of galvanealed steel. Standard finish sea foam green; white or special colors furnished if desired.

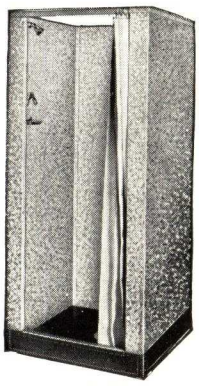
Receptors—Made of 14-gauge steel in baked black enamel finish. Construction otherwise same as vitreous enamel receptors.

Equipment—Models come completely equipped unless otnerwise specified. Specify whether right or left-hand location of valves and shower head wanted. (Face cabinet to designate.)

SPECIFICATIONS

Model	Walls	Receptor	Size, in.			Weight, lbs.
			W.	D.	H.	
D-32	20-gauge	Steel baked enamel...	32	32	76	190
D-36	18-gauge	Steel baked enamel...	36	36	76	210

MODEL A-30 (KNOCKDOWN)



A-30

Recommended Uses—A low priced shower cabinet for summer homes, tourist camps, construction camps, residences, hotels, clubs, resorts, basements, attics, garages, or wherever convenient low priced bathing facilities are desirable.

Walls—Made of 20-gauge galvanized steel specially treated to take finish coats of enamel. Standard with unfinished walls, but can be furnished in sea foam green, or in white enamel.

Receptors—Made of 16-gauge steel in black baked enamel finish.

Equipment—Models come completely equipped unless otherwise specified. Brass parts are in dull chromium on unfinished model, and polished chromium on enameled model.

Specify whether right or left-hand location of valves and shower head wanted. (Face cabinet to designate.)

SPECIFICATIONS

Model	Walls	Receptor	Size, in.			Weight, lbs.
			W.	D.	H.	
A-30	20-gauge	Steel baked enamel...	30	30	76	165

DOORS, SHOWER HEADS, VALVES

Doors — Made specially for use with Bathe-Rite Shower Cabinet, our doors fit openings properly and operate correctly under constant usage.

Frame is all heavy extruded brass polished chrome finish with accurately fitted joints to prevent sagging. Metal splash shield at bottom. Separate jamb insures proper fit at latch and hinge. Solid socket type extruded brass hinge on Gem model. Piano hinge on Viking model.

Glass is obscure type and does not become transparent when wet. Write for detailed catalogue.

HENRY WEIS MANUFACTURING CO., INC.

CABINET SHOWER DIVISION

ELKHART, INDIANA

Sold Nationally through Plumbing Jobbers

For Metal Compartment Division Products, see Manufacturers' Index

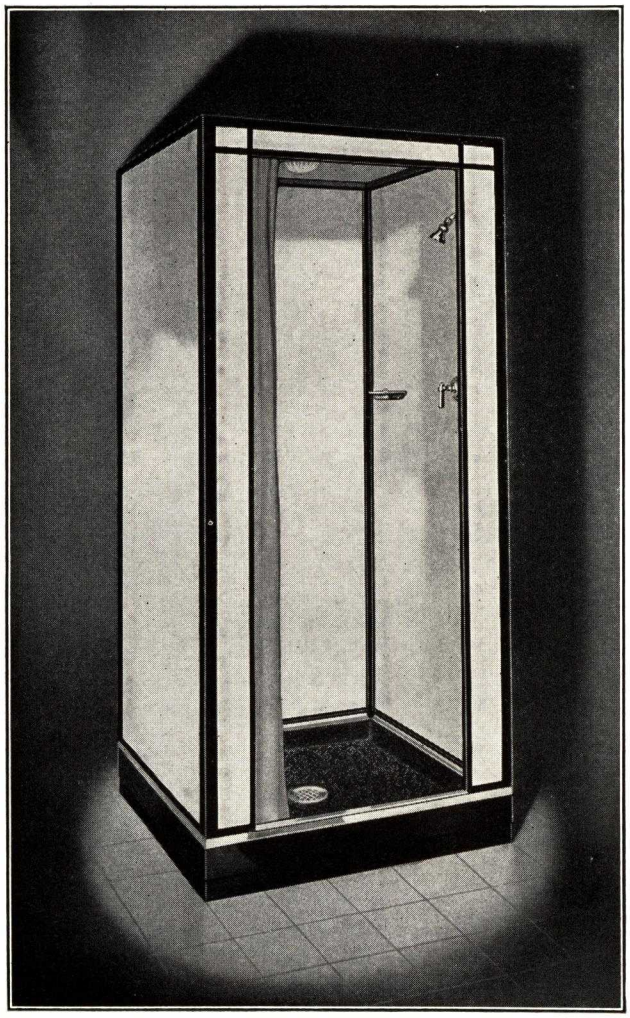
WEISWAY

CABINET SHOWERS

NEW FEATURES

Three years ago the new Weisway line of cabinet showers was introduced. At that time they embodied fifteen years of progressive cabinet shower experience with exhaustive tests under every condition of use. Now, thousands of installations in all types of buildings and service confirm the tested claims made for them three years ago. This combination of factors has resulted in the current enthusiastic acceptance and specification of Weisway Cabinet Showers by leading architects the country over.

FOOT-GRIP—NO-SLIP RECEPTOR (Patented)—For the first time in the plumbing industry, under a newly developed process, a **Vitreous Porcelain Enameled Cabinet Shower Receptor** has been produced, the floor of which is positively "non-slip" dry or wet. Made of one-piece heavy Armco Iron, it is leakproof, non-breakable, non-absorbent, thoroughly sanitary, and can be carried and set by one man.



FLUSH OUTSIDE CONSTRUCTION—There are no projecting members outside to conflict with room plaster or trim—snug, neat installation.

NO VISIBLE BOLTS AND SCREWS—Due to entirely new methods of fabrication and assembly no bolt or screw heads are visible from either the inside or outside of the cabinet—an exclusive Weis feature—finest finished appearance.

TYPES—There are two types of cabinets available in this new construction. **VP Weisway** and **BW Weisway**. Both have the same construction and assembly features throughout and the same Vitreous Porcelain "Foot-Grip—No-Slip" receptors. In the **VP Weisway**, the entire cabinet body is of Armco Iron finished with **Vitreous Porcelain Enamel** inside and out. In the **BW Weisway**, the cabinet body is of galvannealed steel finished in the finest baked-on synthetic gum enamel.

VP WEISWAY

Vitreous Porcelain Enamel

WALLS—Armco Iron. Standard finish—interior and front faces of entrance stiles, white vitreous porcelain enamel with black trim. Available in other colors in shades that will harmonize with colored bathroom fixtures of other manufacture. Exterior (standard finish) sides and back, black ground-coat vitreous porcelain enamel. When either or both sides or back are exposed, they are finished to match interior, if so ordered, at small additional charge. Top, including Weis Showerlite, less electrical equipment, furnished as an extra.

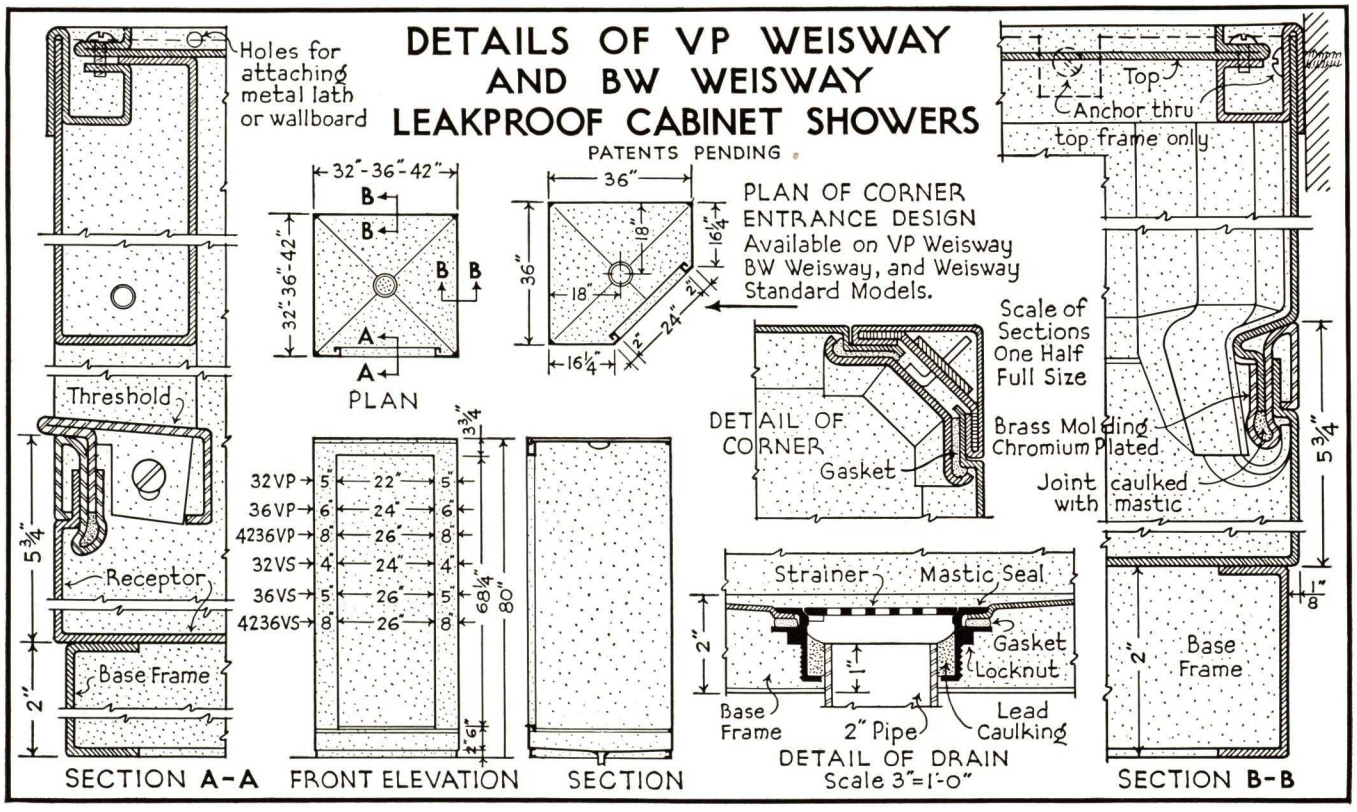
RECEPTOR—Armco Iron, one piece, vitreous enamel. Exterior Jet Black; Interior Textured Green on Black. Floor, "Foot-Grip—No-Slip" surface. Cast waste with strainer, threshold, and exterior trim, all brass chrome plated.

STANDARD EQUIPMENT—Brass Chromium Plated. (1) Two-valve (renewable seats) combination unit. (2) Adjustable water-saver type, self-cleaning head. (3) Cast Brass waste with strainer for 2-in. pipe. (4) Soap Dish. (5) Curtain Rod.

Size, in. W D H	Catalog number	Code	Approx. Shipping weight
32x32x80	32VP	PWLS	340 lbs.
36x36x80	36VP	PBOK	360 lbs.
36x36x80*	36VPC*	PUDX	360 lbs.
36x42x80	3642VP	PYXT	460 lbs.
42x36x80	4236VP	PADN	460 lbs.

Sizes other than above on special order.
* Corner entrance model; see illustration for BW WEISWAY model.

NOTE: VP WEISWAY is illustrated with mixing valve, optional equipment on all WEISWAY Cabinets. Walls must be drilled at factory for standard, optional or other specified fixtures.



BW WEISWAY

Baked Synthetic Gum Enamel Cabinet

CONSTRUCTION—The construction features of the **BW Weisway** are identical with those of the **VP Weisway** as shown on the construction details above.

WALLS—Galvannealed steel. Standard finish White Weisway baked enamel, inside and out, with black trim. Other colors at small extra cost. Also furnished baked prime coat for finish by others. Top, including Weis Shower-lite, less electrical equipment, furnished as an extra.

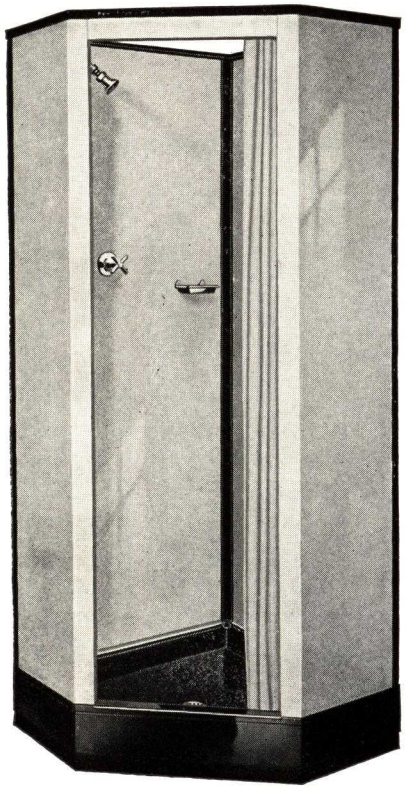
RECEPTOR—Armco Iron, one piece, vitreous porcelain enameled; Exterior, Jet Black; Interior, Textured Green on Black. Floor, "FOOT-GRIP—NO-SLIP" surface. Threshold, Black vitreous porcelain enameled. Cast waste with strainer, brass chromium plated. Exterior trim brass enameled.

STANDARD EQUIPMENT—Brass Chromium Plated. (1) Two-valve (renewable seats) combination unit. (2) Adjustable, water-saver type, self-cleaning head. (3) Cast waste and strainer for 2-in. pipe. (4) Soap dish. (5) Curtain rod.

Size in. W D H	Catalog number	Code	Approx. Shipping weight
32x32x80	32VS	VELZ	310 lbs.
36x36x80	36VS	VOSR	330 lbs.
36x36x80*	36VSC*	VROB	330 lbs.
36x42x80	3642VS	VIZU	440 lbs.
42x36x80	4236VS	VUEP	440 lbs.

* Corner entrance model; see illustration.
Sizes other than above on special order.

NOTE: BW WEISWAY is illustrated in corner entrance design—also available in VP WEISWAY and WEISWAY Standard—suggested where space arrangement requires special consideration for convenient entrance.

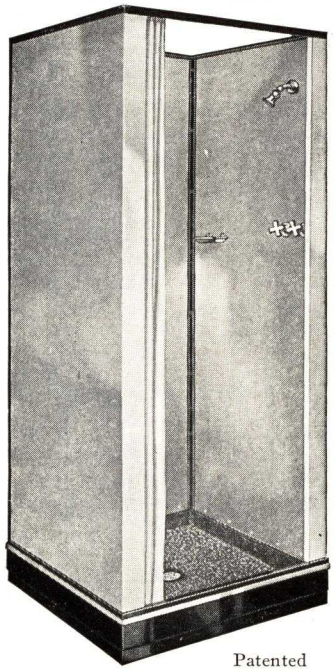


WEISWAY STANDARD

WALLS—Special processed galvanized steel. Finish, White Weisway baked enamel, inside and out. Other colors at small extra charge. Also furnished in baked prime coat for finish by others. Corner assembly members and top frame, Black Weisway baked enamel.

STANDARD EQUIPMENT — Brass Chromium Plated. (1) Two-valve (renewable seats) combination unit. (2) Adjustable, water-saver type, self-cleaning head. (3) Cast waste and strainer for 2 in. pipe. (4) Soap dish. (5) Curtain rod. (6) White duck curtain, 100% pre-shrunk, with chromium rings.

WEISWAY STANDARD



Patented

RECEPTOR—Armco Iron, one-piece, vitreous porcelain enameled; exterior, Black; interior, Textured Green on Black. Floor, "Foot-Grip—No-Slip" surface. Threshold, Black vitreous porcelain enameled. Cast waste with strainer, brass chromium plated.

Size, inches W D H	Catalog number	Code	Approx. Shipping weight
32x32x76	32VR	SPVO	250 lbs.
36x36x76	36VR	SPZU	270 lbs.
36x36x76*	36VRC	SPKE	270 lbs.

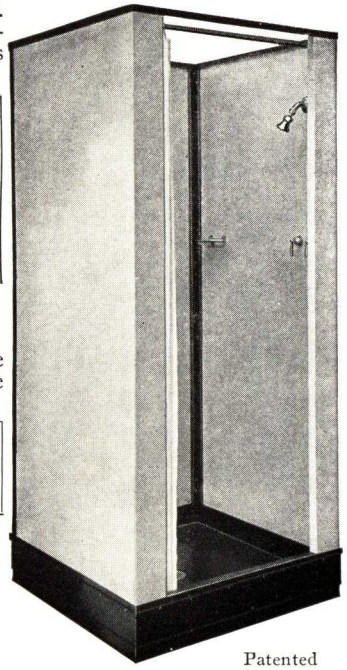
* Corner entrance model; see illustration for BW WEISWAY model.

WEISWAY JUNIOR

Made in one size only, designed to meet needs where space is limited. Specifications, except for modified refinements, are similar to the Weisway Standard.

Size, inches W D H	Catalog number	Code	Approx. Shipping weight
30x30x76	30SP	SPLR	195 lbs.

BUDGETEER



Patented

COTTAGER

WALLS — Galvanized steel, select Satin Finish, modernistically paneled. Entrance stiles and top frame, Black baked enameled.

RECEPTOR—Galvanized steel, one-piece construction. Black enamel finish, baked on at 350°F.

STANDARD EQUIPMENT—Brass Dull Chromium Plated. (1) Two-valve (renewable seats) combination unit. (2) Adjustable, water-saver type, self-cleaning head. (3) Cast waste and wrought strainer for 2 in. pipe. (4) Soap dish. (5) Curtain rod. (6) White duck curtain, 100% pre-shrunk, with chromium rings.

Size, inches W D H	Catalog number	Code	Approx. Shipping weight
30x30x76	53G	CURZ	140 lbs.

BUDGETEER

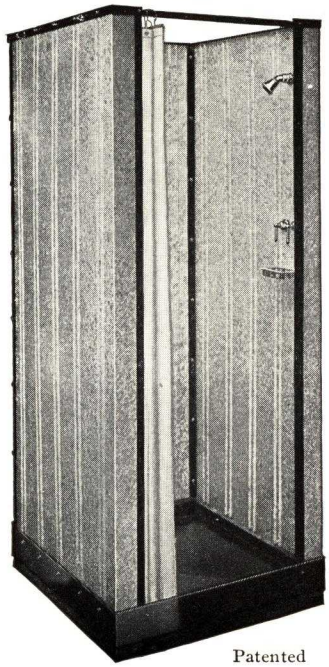
WALLS — Galvanized steel. Furnished in baked prime coat, for finish by others, or inside and outside White baked enamel. Other colors at small extra charge. Corner assembly members and top frame Black baked enamel.

RECEPTOR—Galvanized steel, one-piece construction, Weisway special Black enamel finish, baked on at 350°F. Threshold, galvanized steel, Black baked enamel.

STANDARD EQUIPMENT—Same as for Cottager cabinet.

Size, inches W D H	Catalog number	Code	Approx. Shipping weight
32x32x76	32B	BRMD	250 lbs.
36x36x76	36B	BRKT	270 lbs.

COTTAGER



Patented

WEISTALL INTEGRAL

WALLS—Series S, Steel, ⅛ in. (11 gauge) copper-bearing steel. Series A, Aluminum Alloy, ⅛ in. (9 gauge) aluminum alloy. Finished in prime coat only (gray metal primer baked on at 350°F.).

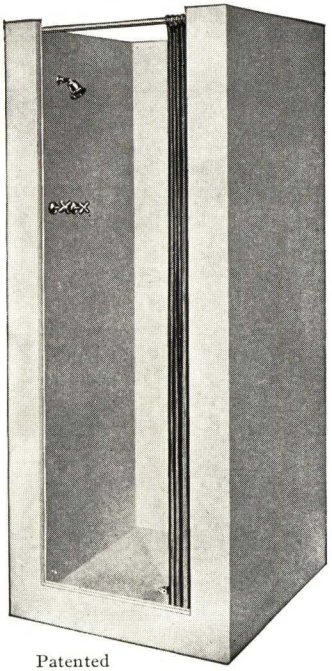
BOTTOM—Series S, Steel, ⅛ in. (11 gauge) galvanized steel. Series A, Aluminum Alloy, ⅛ in. (9 gauge) aluminum alloy. Finished in prime coat only (gray metal primer baked on at 350°F.). Cast waste with strainer, brass chromium plated.

STANDARD EQUIPMENT—Brass Chromium Plated. (1) Two-valve (renewable seats) combination unit. (2) Adjustable, water-saver type, self-cleaning head. (3) Cast waste and strainer for 2 in. pipe. (4) Soap dish. (5) Curtain rod. (6) White duck curtain, 100% pre-shrunk, with chromium rings.

Note: After installation, cabinets should be given two coats of air-drying enamel of good quality, applied according to manufacturer's instructions. Weistall baked-on primer will not bleed through finish coats. Baked enamel finish not available.

	Size, inches W D H	Catalog number	Code	Approx. Shipping weight
Series-A Steel	36x36x72	1S	WSIK	360 lbs.
	40x28x72	2S	WSOU	340 lbs.
	28x40x72	3S	WSOV	340 lbs.
	32x32x72	4S	WSAR	320 lbs.
Series-A Alum. Alloy	36x36x72	1A	WAFJ	220 lbs.
	40x28x72	2A	WAGT	220 lbs.
	28x40x72	3A	WAHB	220 lbs.
	32x32x72	4A	WAJX	200 lbs.

WEISTALL INTEGRAL



Patented

WEISWAY FOOT-GRIP, NO-SLIP RECEPTORS

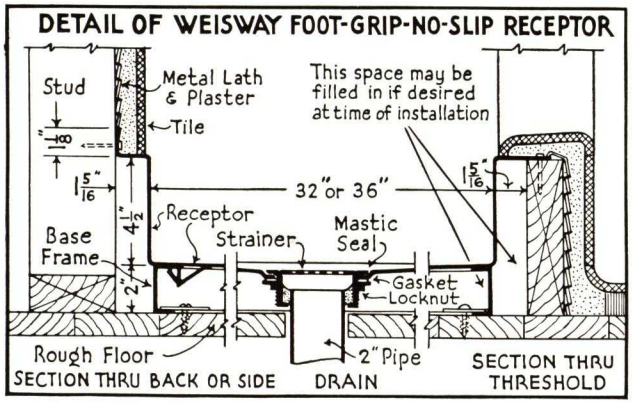
FOR WALLS OF TILE, CEMENT PLASTER, MARBLE, GLASS OR OTHER MATERIALS

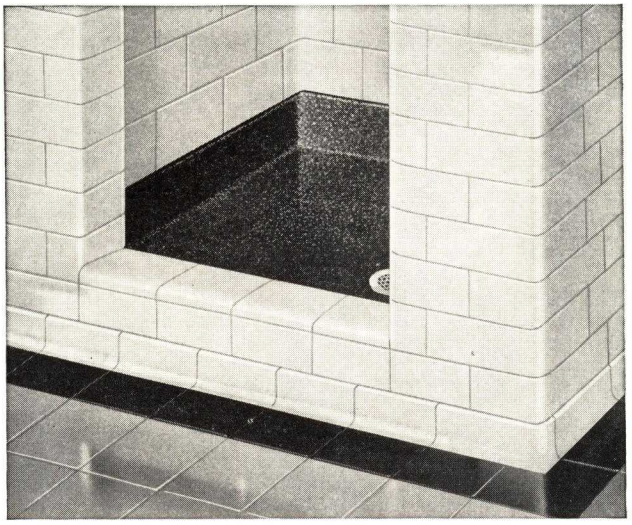
The new Foot-Grip, No-Slip vitreous porcelain enameled shower receptor, so successful in Weisway Cabinet Showers during the past three years, is now available in a special design adaptable to walls of tile, cement plaster, marble, glass or other materials.

This development assures permanent leakproofness since the receptor is not affected by settling or shrinkage and the expensive necessity of built-in lead pans and special drains is entirely eliminated. The beauty, permanency and sanitation of vitreous porcelain is at last combined with a floor surface that is non-slip. The Weisway receptor, which is one-piece, leakproof and non-breakable, can be carried and set by one man.

Specifications—Armco Iron, one-piece, vitreous porcelain enameled. Exterior—jet black; interior—textured green on black. Floor—FOOT-GRIP, NO-SLIP surface. Chromium plated cast brass waste and strainer for 2″ pipe, inside caulking. Base frame—galvannealed steel, black baked enamel finish.

Size, in. W D	Catalog number	Code	Approx. Shipping weight
32x32	32CPT	CPTB	100 lbs.
36x36	36CPT	CPTX	100 lbs.





WEIS SHOWER-LITE

Furnished as integral part of all top-ceiling units on VP and BW Weisway cabinets. The bowl of opalescent glass is 1¾ in. deep and 5½ in. in diameter with brass chromium plated frame hinged for access to lamp.

WEIS ENTRANCE ADAPTER FRAME

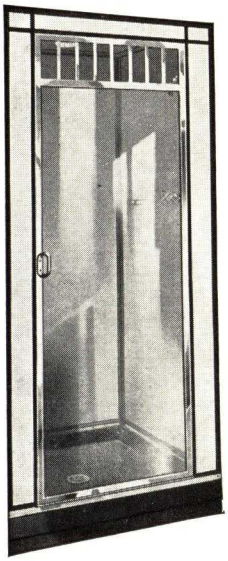
A combination buck and trim of chromium plated brass for easy adaptation of VP Weisway and BW Weisway Cabinet Shower entrances to tile, marble, glass, linoleum or plaster front facing, if desired, where cabinet is recessed. Furnished with knocked-down jambs, header and threshold as detailed below. This combination, when assembled, affords a practical, permanent and finished opening treatment. Weis High-Door may be used with entrance adapter frame.

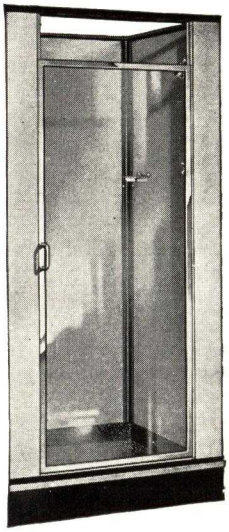
Weis High-Door

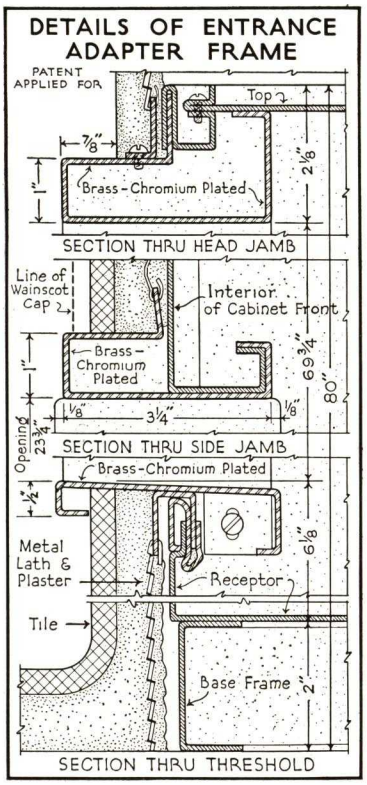
This high quality glass door of attractive ventilator design is available on the VP and BW Weisway models. The door jambs and frame with integral one-piece full length hinge are solid extruded bronze, heavily chromium plated.

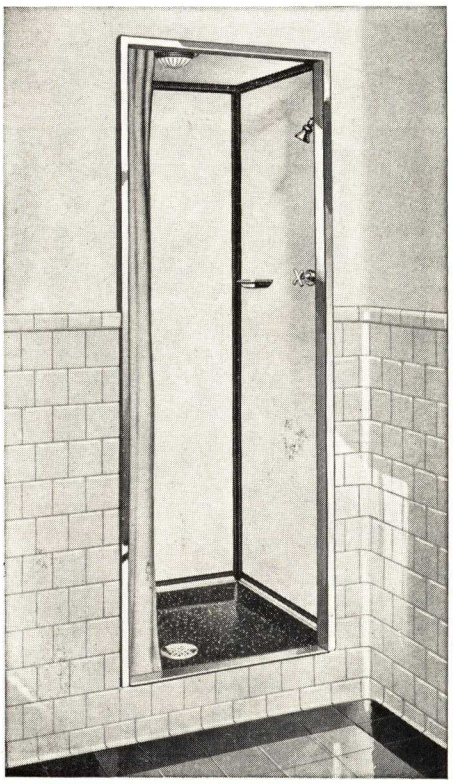
Weis Low-Door

The handsome Weis Low-Door is available on the BW, Standard, Junior, Budgeteer and Weistall Integral models. The door frame and jambs are reinforced stainless steel with specially designed hinges.









DORAN COMPANY

ESTABLISHED 1917

75 Horton Street, SEATTLE, WASHINGTON

Representatives in All Principal Cities—Consult Local Telephone Directory or Write Factory Direct

DORAN SAFE-T-SHOWR THERMOSTATIC WATER MIXING VALVE PRICED FOR UNIVERSAL USE

Operation and Advantages

The Safe-T-Showr Thermostatic Mixing Valve eliminates dangers and inconveniences that have been serious drawbacks to a fuller enjoyment of shower bath bathing. This thermal control functions in two important ways. First: it sets a limit on the maximum temperature of the water it delivers, thus preventing scalding; and second: *it maintains a uniform temperature* at whatever degree the operator sets the valve handle and without those uncomfortable fluctuations so evident in the ordinary type of shower.

Recommended Uses

The Doran Safe-T-Showr is suitable for every type of installation where hot and cold water are to be blended and kept within fixed temperature limits.

Homes, hotels, clubs, schools, factories, institutions, hospitals, barber shops and beauty parlors find use for it.

Principle and Construction

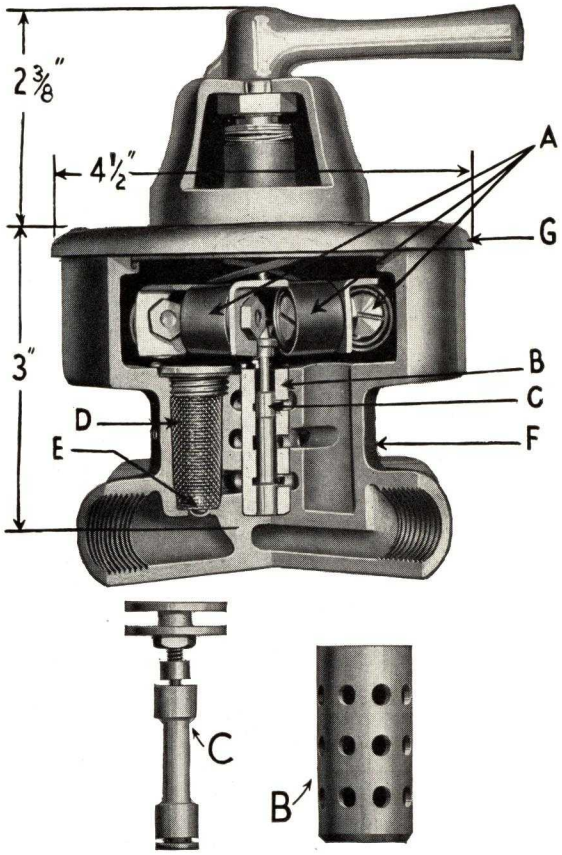
Automatic action is governed by 8 thermal coils (A). The instant water reaches these elements at a greater heat than any particular setting the handle calls for, the elements expand, moving down the piston and admitting cold water. Thus the mixture is held constant to any handle setting. If the cold supply should fail the elements expand to completely close the hot ports; if the handle setting is for warm water and the hot water supply fails, the automatic action cuts off the cold supply. Scalding or chilling under any and all circumstances is prevented.

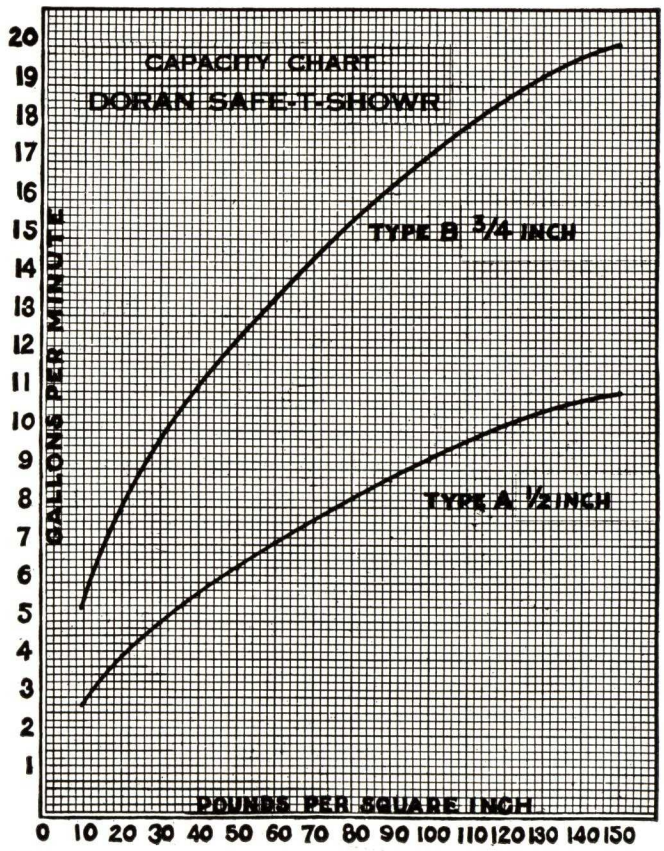
The circular grouping of the eight ½-in. wide thermal coils furnish a centralized power much in excess of the amount necessary to actuate the piston. This gives a very high factor of safety, higher than other thermostatic valves. The thermal coil ends engage directly the floating piston without gears or levers. Friction reduced to the absolute minimum. All this combines, we believe, to make the Safe-T-Showr the safest, the most accurate and most dependable thermostatic valve on the market today. The Safe-T-Showr is set to deliver a maximum temperature of 120°, and handle adjustment permits variations from cold water to 120°. A higher factory setting may be had if desired. The body and cover are made of high pressure cast bronze and all parts are non-corrosive.

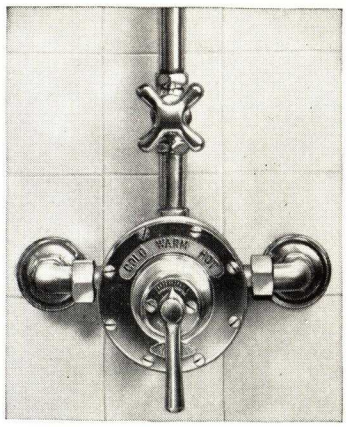
The piston (C) is made of stainless steel, and is provided with a simple adjustment for changing the temperature maximum, should this be desired. Sleeve (B) is made of stainless steel and is removable. The thermal elements, Wilco Metal, are guaranteed against crystallization or fatigue. Both the hot and cold inlets of the valve are equipped with check valves (E) and monel strainers (D). All parts are accessible and removable from the face of the mixer. The two discharge openings are for tub and shower, and one should be plugged if only one is desired. Plug furnished with mixer.

The Safe-T-Showr does not shut the water off. A volume control shut-off *must* be installed as indicated in roughing-in diagrams.

Safe-T-Showrs are sold with or without volume control valves, union elbows, loose key stops, etc. An adapter ring is available for steel partition installations.







A-2
A-2—½-in. size
B-2—¾-in. size

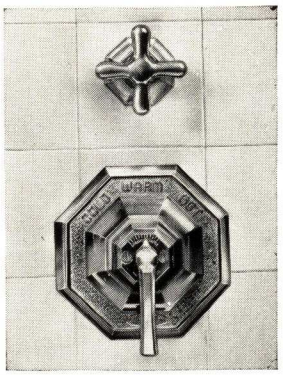
SERIES "A" DORAN SAFE-T-SHOWR VALVES—½-IN. SIZE

A-2—Exposed type, polished and chromium plated. For factory or basement showers the exposed type A-2 in rough bronze is available also. Loose key handle if desired.

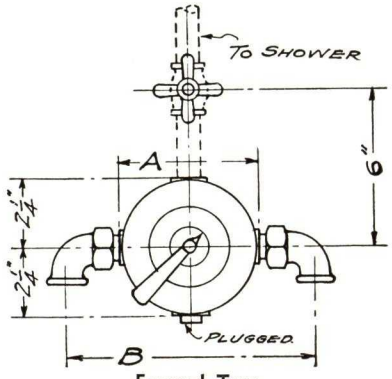
A-3—Concealed type Safe-T-Showr with round escutcheon, concealed parts rough bronze, exposed parts polished and chromium plated.

A-4—Concealed type Safe-T-Showr with octagon artcraft escutcheon, concealed parts rough bronze, exposed parts polished and chromium plated.

A-3
A-3—½-in. size
B-3—¾-in. size



A-4
A-4—½-in. size
B-4—¾-in. size

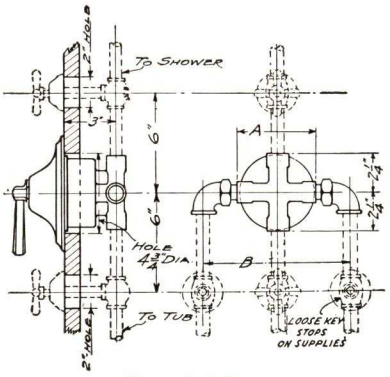


Exposed Type
Type A—½-in. valve
A = 4½ in. B = 8½ in.
Type B—¾-in. valve
A = 5½ in. B = 9¾ in.
Measurements same for either union elbows or loose key stops.

SERIES "B" DORAN SAFE-T-SHOWR VALVES—¾-IN. SIZE

Series "B" Safe-T-Showr Valves are ¾-in. size, available in three types (B-2, B-3 and B-4) and resemble the Series "A" Valves in all respects, except size.

Series "B" also available with ½-in. supplies and ¾-in. discharge.



Concealed Type
Type A—½-in. valve
A = 4½ in. B = 8½ in.
Type B—¾-in. valve
A = 5½ in. B = 9¾ in.

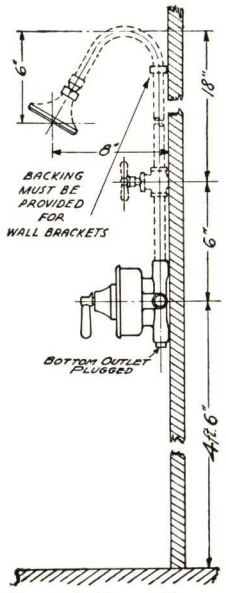
GROUP CONTROL

Although effective group control will safeguard against scalding it does not prevent fluctuations in the temperature of the individual shower units as does individual control.

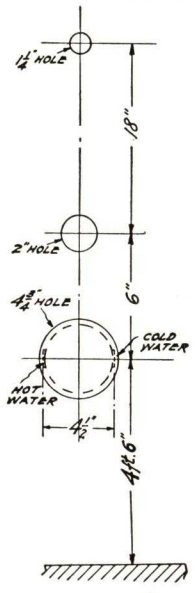
When greater economy makes group control necessary it should be arranged in small units, for otherwise the turning on of only a few showers in a large battery under one master control will not produce sufficient flow to secure satisfactory results.

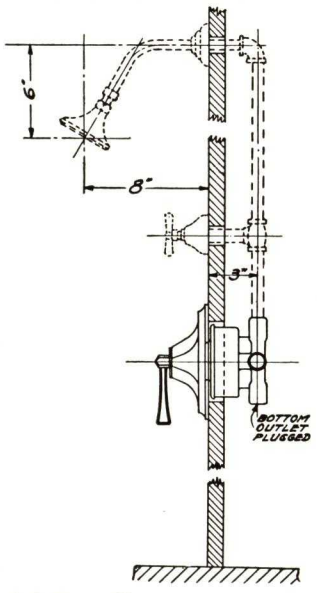
We recommend our series "B" ¾-in. valve, controlling 3 heads, as the safe method of group control.

COMPLETE THERMOSTATIC SHOWERS

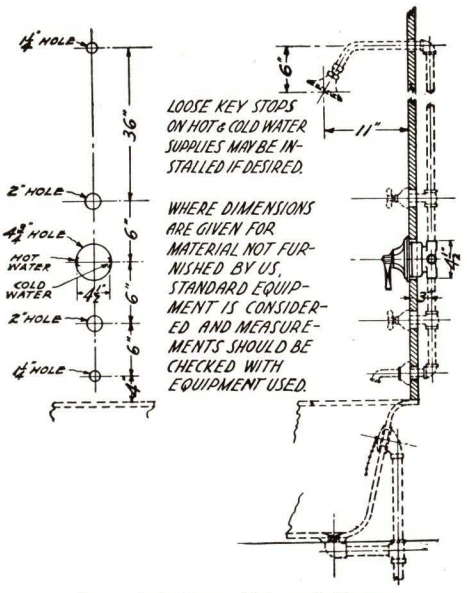


Exposed Type—Shower





Concealed Type—Shower



Concealed Type—Tub and Shower

Ask for Catalog No. 30 A.I.A. File 29-H-3 on Doran Thermostatic Showers
Ask for Circular S-300 on Doran Thermostatic Steam and Water Mixers

LAWLER AUTOMATIC CONTROLS, INC.

Manufacturers of Lawler Thermostatic Mixing Valves and Tank Regulators

453 North MacQuesten Parkway
MOUNT VERNON, N. Y.

NON-SCALDING SHOWER MIXING VALVES

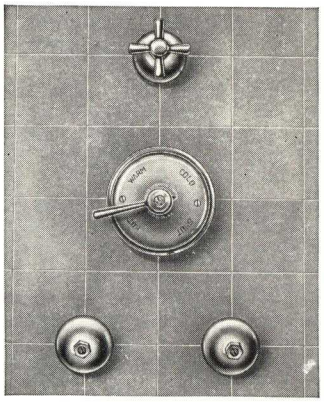
The Lawler individual thermostatic shower mixing valve is made in ½ and ¾-in. sizes, for either concealed or exposed piping. Type "BC" is concealed and Type "BE" exposed.

This valve controls thermostatically the mixing of hot and cold water, and delivers water at a desired constant temperature, regardless of pressure or input temperature changes. They are ideal for use in shower baths, baby baths, shampoo fixtures, continuous flow baths and various industrial uses.

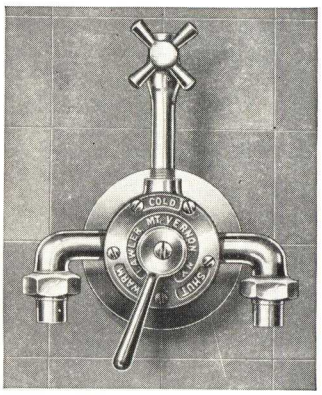
Body is of heavy cast bronze, and all interior parts are either brass, bronze or nickel. It has only one moving part. Hot water seat is positive bronze to bronze. Cold water is controlled by the only moving part, a slide piston type valve. The combined outlet shutoff is controlled by a soft Jenkins-type valve disc. Head is easily removable for examination and cleaning.

The thermostatic element used in all Lawler valves is of the solid filled liquid expansion type—extremely sensitive, powerful in action and reliable. The patented coil construction—giving long travel in combination with the powerful hydraulic action, both obtained with slight temperature changes—makes this thermostat particularly adapted for the direct operation of valves for controlling temperatures within narrow limits. The expansion and contraction of the liquid makes this valve positive in action and develops extreme pressure so that valve seats and slide ports are practically self-cleaning. At very slight changes in temperature the thermostat quickly expands or contracts, regulating the proportion of hot and cold water accordingly.

Each mixer is thoroughly tested at our factory and set to deliver water at any temperature desired between cold and 110° F. Escutcheon on concealed type and valve head on exposed type are marked "cold", "warm", "hot" and "off", so that the pointer handle can be set at a given point.



Type "BC" Concealed



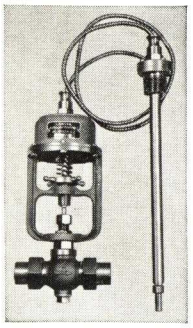
Type "BE" Exposed

LAWLER TYPE "S" TANK REGULATOR

This regulator is designed and constructed for use on low pressure systems only. It is used to accurately control the temperature of all types of steam heated tanks, vats, preheaters, etc.

All parts used in the construction of this product are of brass, bronze or copper. Special monel or stainless steel trim can be furnished at a slight additional cost.

The standard setting is 160° with an allowable adjustment of 20° above and below that setting. If any special ranges are required they can be made to order promptly.



THERMOSTATIC MIXING VALVES AND TEMPERING VALVES

Thermostatic Mixing Valves

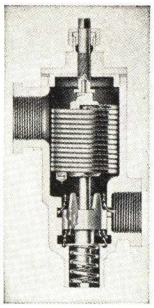
Lawler Models "B" and "BA" thermostatic mixers for use on battery or gang showers and for industrial purposes are made in all sizes from ⅜ in. up to and including 2 in.

Model "B" has a set and locked adjustment and Model "BA" has an adjusting lever. All interior parts in Model "B" are interchangeable with Model "BA."

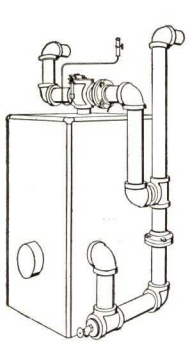
This heavy cast brass valve is simple in design and yet extremely sensitive to temperature changes. The sensitive and powerful thermostat located in the mixing chamber controls the amount of hot and cold water entering valve so that outlet temperature is always maintained at its predetermined setting.

Thermostatic Tempering Valves

Where domestic water is heated by a coil submerged in the heating boiler or similar "tank-saver" systems, excessive water temperatures frequently occur during periods of small demand. The use of a Lawler Tempering Valve prevents this high temperature water from reaching the plumbing fixtures as it functions to admit the required amount of cold water to reduce the temperature of the mixture to 140° F. maximum.



LAWLER *"weather-matic"* HOT WATER HEATING SYSTEMS



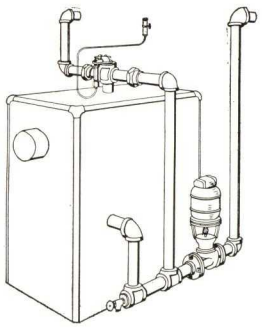
The Lawler "weather-matic" valve is an automatic proportioning valve controlled entirely by outside temperature.

On either gravity types or forced circulation systems it will deliver water from the boiler at the exact temperature needed to maintain the required inside temperature.

Use of a "weather-matic" valve eliminates all room thermostats in gravity type systems. No electrical connections are necessary. Maintenance costs are completely wiped out. It shuts tight when no heat is required, thereby effecting a decided economy in operation.

If boiler is equipped with either a submerged coil or a side arm heater for domestic hot water purposes, a "weather-matic" valve is the satisfactory way of obtaining hot water at all times.

Valve is installed in the heating main as close to boiler as possible. Return main must be trapped, and a by-pass connection installed and connected to the by-pass opening on the valve. The outdoor thermostat bulb should be located on north or northeast side of the house away from direct rays of the sun. Full installation instructions accompany each valve.



INCORPORATED 1913

LEONARD-ROOKE COMPANY

Manufacturers of Leonard Thermostatic Water Mixing Valves

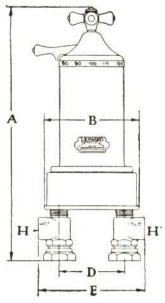
NEW YORK OFFICE
101 Park Avenue, Room 1724
NEW YORK, N. Y.

PLANT AND MAIN OFFICE
1360 Elmwood Avenue
CRANSTON, R. I.

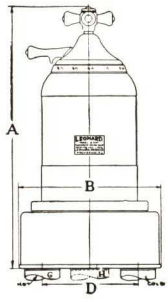
Leonard Valves are essential for many purposes—domestic, commercial, and industrial. The anti-scalding and anti-chilling feature results from the Leonard solid metal type of thermostat which is used in all Leonard Valves. Expert workmanship and fine materials give long life and efficient service. There is a Leonard Valve for every possible need, and each one, before leaving the factory, is tested under hot and cold water at varying pressures and temperatures, duplicating as nearly as possible the conditions under which it is to be used.

MODELS B AND MB

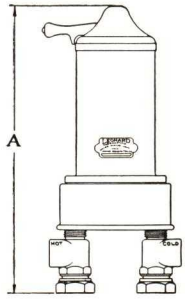
Model B



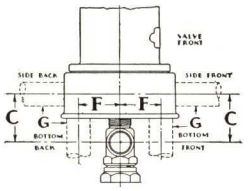
B120-200



Modified B

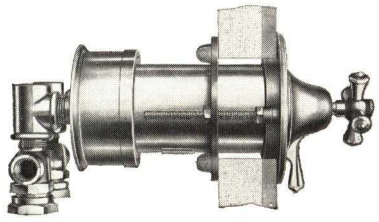


Model B Exposed	Roughing-in dimensions, inches						Outlet	Inlet	Capacity, gallons per minute at 45 lbs. per sq. in.
	A	B	C	D	E	F	G	H	
B-5	14 5/8	5	2 1/4	3 5/16	5 11/16	1 5/8	3/4	1/2	5
B-10									15
B-20	14 5/8	5	2 1/4	3 5/16	5 13/16	1 5/8	1	3/4	24
B-40	18 1/4	6 7/8	2 3/4	4 3/4	7 3/4	2 1/8	1 1/4	1	45
B-60	18 1/4	6 7/8	2 3/4	4 3/4	8 3/4	2 1/8	1 1/2	1 1/4	63
B-105	15 1/4	9 1/8	....	6 1/2	....	....	2	1 1/2	105
B-120	16 11/16	9 1/8	....	6 1/2	....	....	2	1 1/2	125
B-200	17 3/4	9 5/8	....	6 1/2	....	....	2 1/2	2	200



Outlets

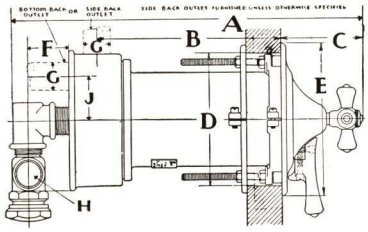
Modified B Exposed	Dimension A, inches
MB-5	13
MB-10	13
MB-20	13
MB-40	16 1/2
MB-60	16 1/2
MB-105	13 1/2
MB-120	15
MB-200	16



Model B Concealed

B and Modified B valves are built in a wide range of sizes to deliver tempered water at flows of from 5 to 200 gallons per minute.

Model B valves have the integral volume control and shut-off and are furnished with combination strainers and check valves. All valves are furnished with choice of outlets as shown above.



Model B Concealed

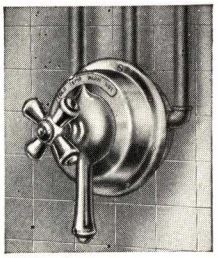
All B valves, with the exception of the B-5, B-105, B-120 and B-200, are furnished for horizontal concealed or vertical concealed installation.

The Modified B valves have no integral volume control and shut-off. Otherwise they are identical to the Model B valves. They are made for installation where a separate volume control and shut-off is a part of each fixture.

Model B, Concealed	Roughing-in Dimensions, inches							Outlet	Inlet	Capacity, gallons per minute at 45 lbs. per sq. in.
	A	B	C	D	E	F	J	G	H	
B-10	14 1/8	6 7/8	4	5 1/4	6 1/2	1 3/8	1 5/8	3/4	1/2	15
B-20	14 1/8	6 7/8	4	5 1/4	6 1/2	1 3/8	1 5/8	1	3/4	24
B-40	17 1/2	9 5/16	4 1/16	6 1/2	7 1/2	1 7/8	2 1/8	1 1/4	1	45
B-60	17 1/2	9 5/16	4 1/16	6 1/2	7 1/2	1 7/8	2 1/8	1 1/2	1 1/4	63

ANTI-SCALDING, ANTI-CHILLING THERMOSTATIC VALVES

TYPE L-9-E



For Exposed Piping

TYPE L-9

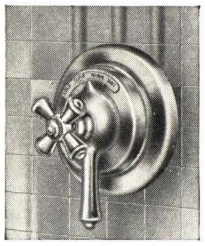
L-9 valves are built with the integral volume control and shut-off.

Type L-9 with Elbow Control is for Surgeon's Lavatories, Dentists' Offices and other similar installations to obviate the necessity of touching the fixture with the hands.

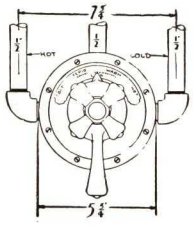
The Octagon design is used with other octagon fittings.

Type L-9 P.C. is designed especially for penitentiary and institution use. It is impossible to remove any parts without a complete knowledge of the assembly.

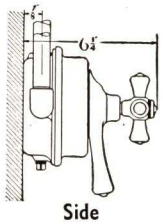
TYPE L-9-C



For Concealed Piping

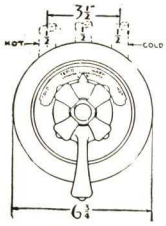


Front



Side

Type L-9-E with Knee Control is equipped with blade lever for temperature regulation and a standard type of stirrup control on the volume control and shut-off.



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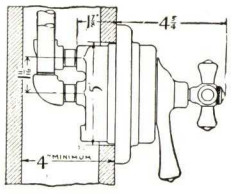

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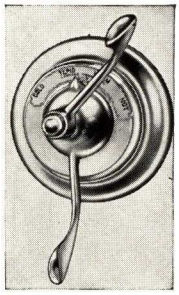
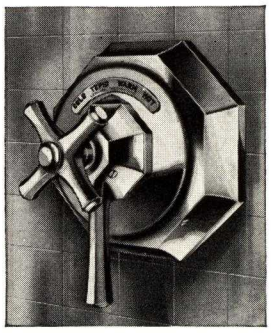
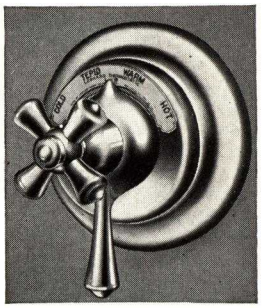


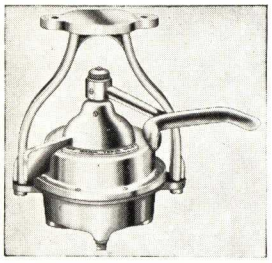
L-9 Elbow Control



L-9-C Octagon



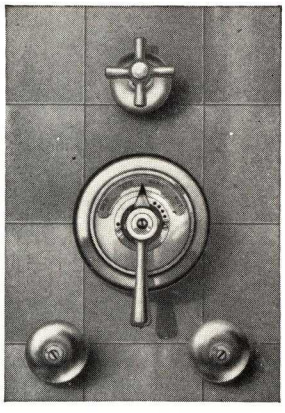
L-9-P.C.

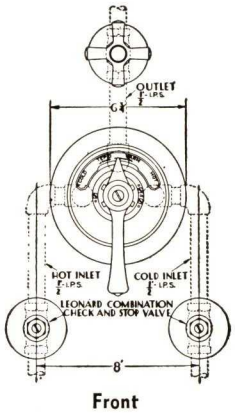


L-9-E with Knee Control

TYPE L-8

L-8-C





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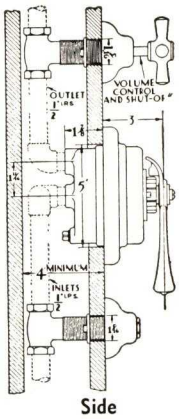
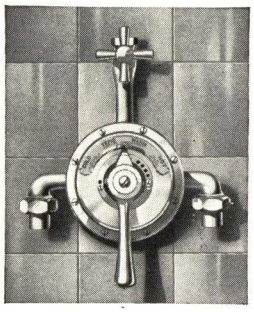
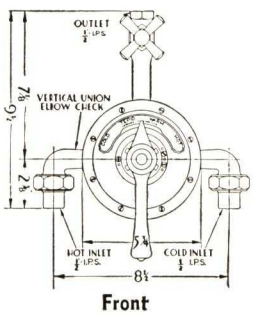


Side

L-8-E





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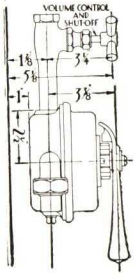


Side

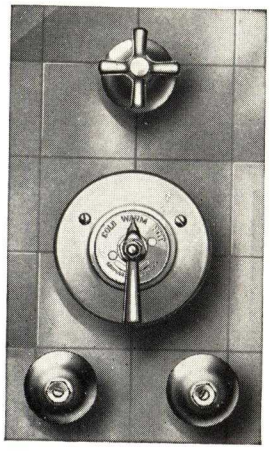
Type L-8 for concealed piping is furnished with concealed volume control and shut-off valve, also Leonard Combination Check and Stop Valves.

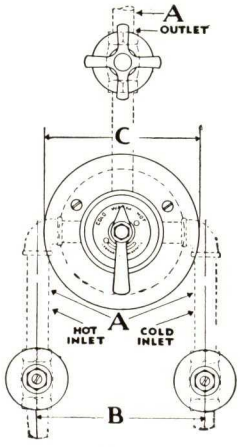
Type L-8 for exposed piping is furnished with volume control and shut-off and vertical union elbow checks. It does not have the integral volume control and shut-off feature but otherwise is the same as the L-9. All these valves have the same type of metal thermostat and are anti-scalding and anti-chilling.

SIMPLE CONSTRUCTION, DURABLE MATERIALS

SERIES R AND T

R—Concealed





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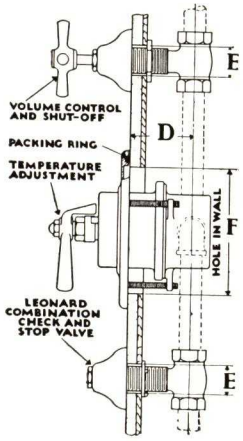


Side

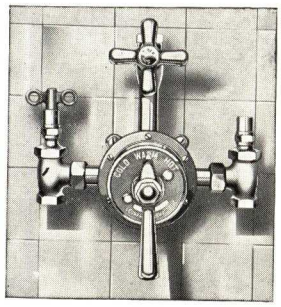
Series R valves are furnished for exposed and concealed piping. The exposed type is equipped with either union angle check stops or vertical union elbow checks as required. The finish is chromium or nickel plate.

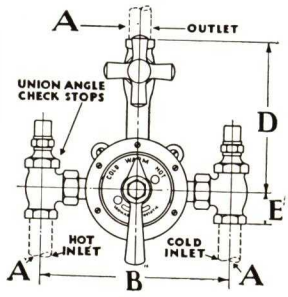
Charts below give dimensions of all R and T valves.

R—CONCEALED

Series R, Concealed	Principal Dimensions, inches					
	A	B	C	D	E	F
R-5-C	1/2	8	6 1/2	3	1 5/16	4 7/8
R-10-C	1/2	8	6 1/2	3	1 5/16	5
R-15-C	3/4	8	6 1/2	3	1 3/4	5
R-25-C	3/4	8	7 1/2	3	1 3/4	6
R-45-C	1	8	7 1/2	3	1 3/4	6

R—Exposed with Union Angle Check Stops





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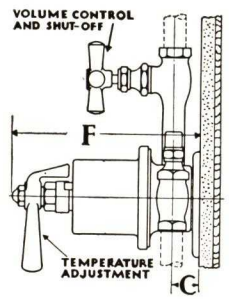
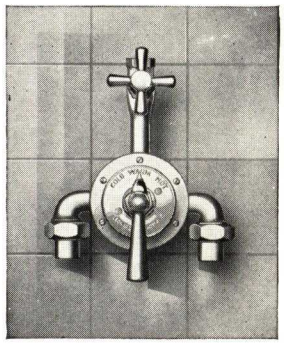


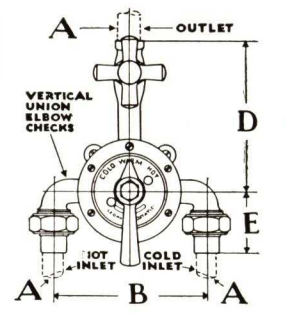
Side

R—EXPOSED
With Union Angle Check Stops

Series R, Exposed	Principal Dimensions, inches					
	A	B	C	D	E	F
R-5-E	1/2	7 3/4	1 1/16	5 7/8	1 1/4	7 1/16
R-10-E	1/2	8 1/4	1 1/8	6 1/8	1 1/4	7 11/16
R-15-E	3/4	8 1/4	1 1/8	6 1/2	1 1/2	7 11/16
R-25-E	3/4	8 5/8	1 3/8	6 3/4	1 1/2	8 1/8
R-45-E	1" inlet 1 1/4" outlet	8 3/4	1 1/2	7	1 1/2	8 3/4

R—Exposed with Vertical Union Elbow Checks





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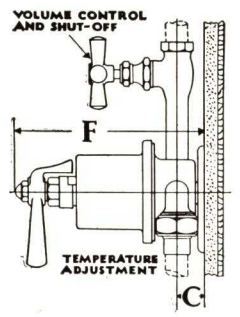
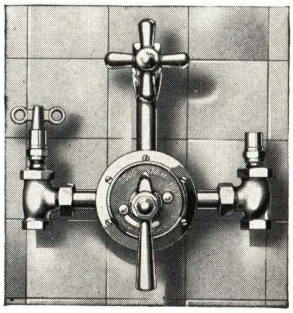


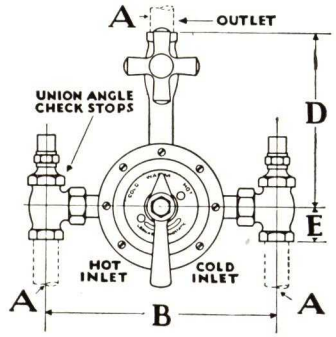
Side

R—EXPOSED
With Vertical Union Elbow Checks

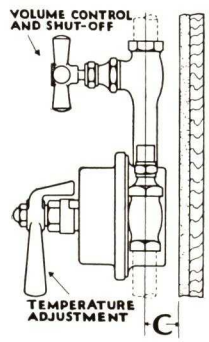
Series R, Exposed	Principal Dimensions, inches					
	A	B	C	D	E	F
R-5-E	1/2	6 3/8	1 1/16	5 7/8	2 7/16	7 1/16
R-10-E	1/2	7	1 1/8	6 1/8	2 7/16	7 11/16
R-15-E	3/4	7	1 1/8	6 1/2	2 3/4	7 11/16
R-25-E	3/4	7 1/2	1 3/8	6 3/4	2 3/4	8 1/8

T—Exposed Only





Front



Side

Series T valves are furnished in exposed type only and are equipped with union angle check stops only.

T—EXPOSED

Series T, Exposed	Principal Dimensions, inches				
	A	B	C	D	E
T-8-E	1/2	8 1/2	1 1/4	6 1/8	1 1/4
T-12-E	3/4	8 1/2	1 1/4	6 3/8	1 1/2

MEMORANDA

THE POWERS REGULATOR CO.

Safety Water Mixing Valves

GENERAL OFFICES AND FACTORY
2722 Greenview Avenue, CHICAGO, ILL.
TELEPHONE, Buckingham 7100

GENERAL EASTERN OFFICES
231 East 46th Street, NEW YORK, N. Y.
TELEPHONE, ELdorado 5-2050

BRANCHES AND SERVICE STATIONS
(See Telephone Directory for Local Addresses)

ATLANTA, GA.
BALTIMORE, MD.
BIRMINGHAM, ALA.
BOSTON, MASS.
BUFFALO, N. Y.
BUTTE, MONT.
CHATTANOOGA, TENN.
CINCINNATI, OHIO
CLEVELAND, OHIO
COLUMBUS, OHIO
DALLAS, TEX.
DES MOINES, IOWA
DETROIT, MICH.
EL PASO, TEX.
GREENSBORO, N. C.
HOUSTON, TEX.
INDIANAPOLIS, IND
JACKSONVILLE, FLA.
KANSAS CITY, MO.
LOS ANGELES, CAL.
MEMPHIS, TENN.
MILWAUKEE, WIS.
MINNEAPOLIS, MINN.
NASHVILLE, TENN.
NEW ORLEANS, LA.
OKLAHOMA CITY, OKLA.
PHILADELPHIA, PA.
PITTSBURGH, PA.
PORTLAND, ORE.
ROCHESTER, N. Y.
ST. LOUIS, MO.
SALT LAKE CITY, UTAH
SAN ANTONIO, TEX.
SAN FRANCISCO, CAL.
SEATTLE, WASH.
SYRACUSE, N. Y.

For Powers Automatic Temperature and Humidity Control, see File Index

POWERS THERMOSTATIC WATER MIXER

Adaptability

The Powers Thermostatic Water Mixer thermostatically controls the mixing of hot and cold water and delivers warm water for showers, baby and hydrotherapeutic baths, washing tanks for photographic films and prints, industrial processes, etc.

Tub and Shower Combination

Since this valve is provided with both a top and bottom outlet, a single mixer provided with two shut-offs (for top shower supply and for bottom tub supply) is ideal for showers set over bathtubs in residences. The usual hot and cold supplies are omitted on the tub and tempered water is supplied to the tub through the bath supply.

Safety and Convenience Features

Safety Features—The temperature of the water delivered by the mixer remains constant regardless of temperature or pressure changes in the hot or cold water supply lines.

Failure of either supply completely shuts off the delivery flow.

Restricting the delivery from maximum flow to two gallons per minute will not vary the delivery temperature.

Ease of Adjustment—The small cross arm handle labeled "Shut Off" is used to turn on or shut off the delivery and to regulate the volume. The large handle adjusts the temperature and may be left in any desired position.

Construction

The unusually sensitive and responsive thermostatic element is of the same rugged type as that used successfully for over 20 years in thousands of Powers Thermostatic Water Controllers. A flexible metal packless assembly replaces the usual packing box. The mixer body and internal parts are made of bronze. The mixing valve seats are chromium plated to resist wear and corrosion.

The mixer can be piped for either up or down delivery or both, as it is equipped with outlets at both top and bottom.

Description—Styles, Finishes, etc.

Style TE—For exposed piping. Can be furnished in rough bronze or in polished chromium or nickel finish.

Style TC—For concealed piping. Can be furnished in rough bronze finish or in polished chromium or nickel finish.

Special Shut-off Valve—In cases where a special shut-off valve is required, the standard Powers Shut-off Valve may be omitted.

Capacity—With supply pressure of 60 lbs. the maximum delivery is 11 gals. per min.; 40 lbs., 9 gals.; 20 lbs., 6 gals.

Temperature Range—Temperature range of standard mixer is from cold water to 115° F. A maximum temperature of 140° F. can be furnished upon special order.

SPECIFICATIONS

Note: *All notes are explanatory only and should not be included in the specifications. Portions of text in bracketed italics are selective or require specific data inserted.*

(1) Water Mixers

(1a) General—Furnished and install (a) Powers Thermostatic Water Mixer(s) as made by THE POWERS REGULATOR Co., Chicago, Ill., in the following locations:

Note: *Here list and locate the water mixers. If both Types TE and TC are used, list and locate each separately.*

(1b) Description—Mixers shall be ½ in., Style *(TE) (and) (TC) (as listed above)* with exposed parts of metal *(chromium plated) (nickel plated) (rough bronze) (furnish for maximum temperature of 115° F.).*

(1c) Special Shut-offs—Provide *(specify make)* shut-offs in lieu of standard Powers shut-off on the following mixers:

Note: *List and locate.*

(2) Supplies

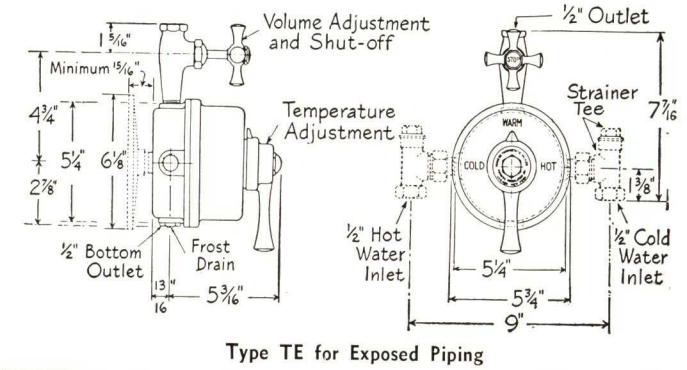
(2a) Both hot and cold water supply mains shall be provided with Powers *(specify sizes)* Self-Cleaning Strainers.

Note: *Strainers are made in ½ in. to 3 in. size.*

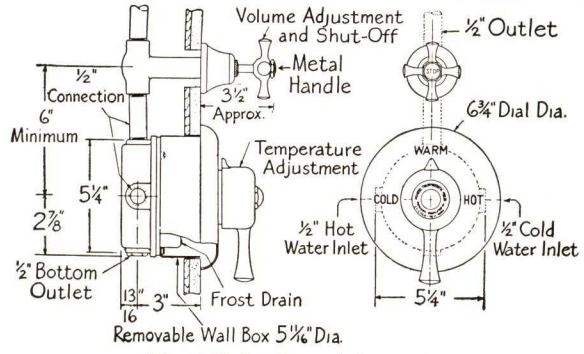
(2b) Hot and cold water line to each mixer shall be provided with loose key stop valves *(with porcelain escutcheons).*

Note: *This valve is to be used as a combination volume control and stop valve.*

(2c) All exposed portions of piping, valves, etc., shall be *(chromium plated) (nickel plated) (rough bronze).*



Type TE for Exposed Piping

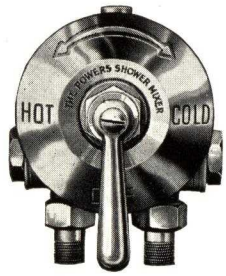


Type TC for Concealed Piping

POWERS SAFETY SHOWER MIXER (PRESSURE EQUALIZING VALVE TYPE)

Adaptability

Because of its simplicity, rugged construction, safety, and economy features, the Powers Shower Mixer is widely used in residences, hotels, hospitals, and especially on showers subjected to more than average use as in clubs, colleges and universities, schools, public baths, and institutions. It is unequaled for heavy duty. Furnished in two sizes; with ½ in. inlets and outlet for standard showers and ¾ in. inlets and outlet for special fixtures.



Comfort and Safety Features—Economies

Pressure Equalizing Valve—Protects bather from danger and discomfort of unexpected "shots" of cold or scalding hot water caused by use of nearby showers, flush valves, etc. If cold water supply fails, it substantially shuts off the hot water.

Safety Stop Screw—Can be set to limit temperature of the shower, thereby preventing the possibility of scalding caused by a "dead end" in the hot water supply.

Check Valves—Built into each inlet, they prevent by-passing or interchange of hot and cold water.

Economies—No time is wasted trying to get water at the right temperature. There are no delays. Fewer showers will accommodate more bathers. No hot or cold water is wasted while bathers wait for showers to get hot or to cool off to the right temperature. Extra large piping, often used to minimize danger of scalding, is unnecessary.

Construction

Powers Mixers are ruggedly built of bronze with all internal working parts chromium plated to resist corrosion and erosion, are not thermostatic and have no composition valve seat washers on hot water inlet to wear out and need frequent replacement. Their sturdy all-metal construction insures a durability not equalled by any other mixer.

Description

Style A—For exposed piping. Has chromium or nickel plated dial and handle. Can be furnished with wall flange if desired in which case distance from center of inlets to wall should be specified.

Style B—For concealed piping, accessible from the rear. The neck of mixer is provided with a 1½ in. extension to accommodate thickness of marble slab, tile or panel. Has chromium or nickel plated exposed parts.

Style C—For concealed piping, accessible only from the front. This style is provided with a metal box to be inserted in wall flush with surface, to receive pipe connections and mixer. The dial covers opening in wall, and when removed makes mixer accessible. Has chromium or nickel plated exposed parts. For thin partitions, shells 3 in. deep can be furnished.

Connections—Style A mixer has female connection without union at outlet, Styles B and C have male connections with union at outlet. The Style A mixer can be furnished with union at outlet when specified, without additional cost. All mixers are provided with standard straight union inlet connections. Elbow connections will be substituted if specified.

Octagonal Dials and Handles—Can be furnished for Styles B and C when specified at an additional charge.

Standard Finish—Chromium or nickel plate. Style A, dial, handle, stem, bonnet, and union connections are highly polished, body is plain unpolished chromium or nickel; Styles B and C, all exposed parts highly polished.

Special Finishes—White metal can be furnished at an extra charge.

Mixers can also be furnished in gold or silver plate or in any color Duco desired. Prices on application.

Round porcelain dials and handles can be furnished for Styles B and C, ½-in. size only. No extra cost.

Capacities

With supply pressures of 60 lbs., the delivery of the ½-in. mixer is 12½ gals. per min.; 40 lbs., 9 gals.; 20 lbs., 7 gals. The delivery of the ¾-in. mixer is approximately twice that of the ½ in. size.

SPECIFICATIONS

Note: *All notes are explanatory only and should not be included in the specifications. Portions of text in bracketed italics are selective or require specific data inserted.*

(1) Shower Mixers

(1a) General—In shower compartment*(s) (locate),* furnish and install *(a)* Powers Shower Safety Mixer*(s)* as made by THE POWERS REGULATOR CO., Chicago, Ill.

(1b) Description—Mixer*(s)* shall be *(½ in.) (¾ in.),* Style *(A) (B) (C)* with *(standard) (octagonal) (chromium plated) (nickel plated) (porcelain)* dial*(s)* and handle*(s).*

(2) Supplies

(2a) Both hot and cold water supply mains shall be provided with Powers *(specify sizes)* Self-Cleaning Strainers.

Note: *Strainers are made in ½ in. to 3 in. size.*

(2b) Cold water line to each mixer shall be provided with loose key stop valve *(with porcelain escutcheon).*

(2c) Hot water line to each mixer shall be provided with a hand valve marked "Volume" *(with porcelain escutcheon).*

Note: *This valve is to be used as a combination volume control and stop valve.*

(2d) All exposed portions of piping, valves, etc., shall be *(chromium plated) (nickel plated).*

(3) Shower Heads

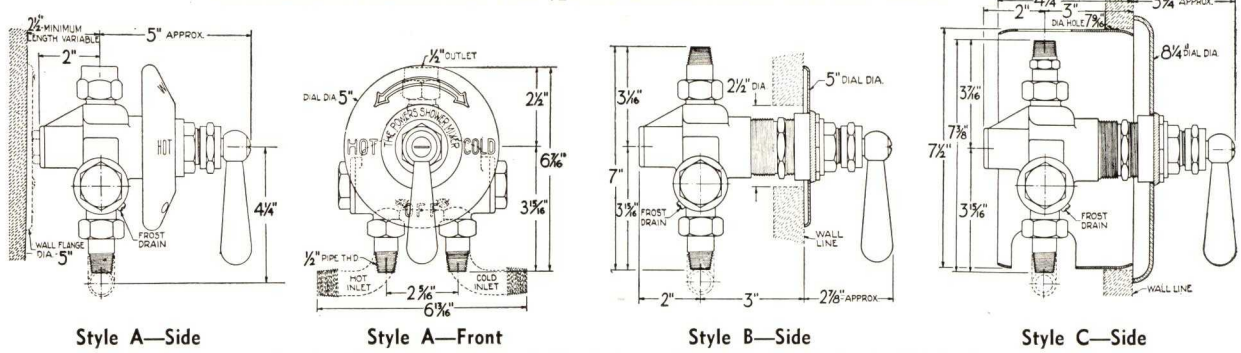
(3a) Furnish and install brass discharge pipe*(s)* with *(gooseneck(s)) (straight wall turn down(s))* and 4 in. diameter cast brass, adjustable, ball joint shower head*(s)* with tightly fitted removable face*(s)* and without gasket*(s).*

(3b) There shall be no valve or throttling device installed in the discharge line from mixer to shower head.

(3c) All exposed portions of piping, shower head*(s),* etc., shall be *(chromium plated) (nickel plated).*

(3d) Discharge line from mixer to shower head when exposed shall be securely anchored to wall or partition.

ROUGHING-IN DIMENSIONS FOR ½-IN. POWERS SAFETY SHOWER MIXER



Style A—Side | Style A—Front | Style B—Side | Style C—Side

Note: Dimensions of ¾-in. mixer will be furnished by the nearest branch office

POWERS THERMOSTATIC WATER CONTROLLER

Adaptability

For shower baths, singly or in gangs, zone showers, hospital hydro-therapy, hot water lines, lavatories, factory washrooms, garages, laundries, and various industrial processes where warm water at a constant temperature is required. (For baby baths use the Thermostatic Water Mixer described on previous page.)

This controller is accurate, dependable, and reasonably priced. Mixes hot and cold water, and delivers warm water at any desired temperature between cold water and 135° F. Entirely automatic in operation, positively scaldproof. Failure of cold water supply cuts off delivery. Can be provided with variable or locked adjustment.

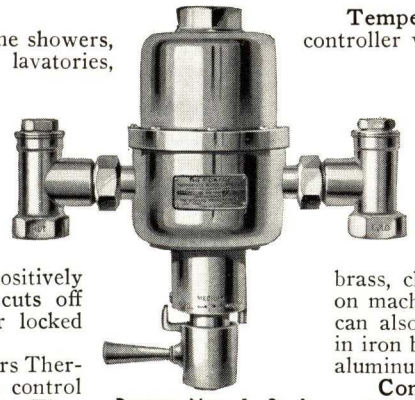
Group or Gang Shower Control—Powers Thermostatic Water Controllers are used for the control of shower baths in groups from 2 to 25 stalls. They may be used to establish a maximum temperature of hot water supply to protect the entire group from danger of scalding, or to place the entire group of showers under the control of an attendant.

Individual Shower Control is best suited for adults as it permits each bather to individually adjust the temperature of his shower while the hot water is kept at a safe maximum temperature.

Attendant Control is best suited for the bathing of children in schools, institutions, etc., as the temperature of the entire group of showers is adjusted by one individual.

Zone Showers—Where compulsory bathing is required before entering swimming pools, lane showers are divided into four zones, each controlled by a Powers Controller. First zone is maintained at 105° F.; second at 90° F.; third at 75° F.; and fourth at 60° F.

Because of its efficiency and its hygienic and sanitary advantage; this type of shower is rapidly increasing in popularity.



Powers Nos. 1, 3, 4 Controller for Exposed Piping

Dial and Handle for Concealed Piping

Description

General—Controllers have inlet check valves and removable filter screens. Hot and cold water should always come from the same original source or be under approximately the same pressure, which for best results should not exceed 100 lbs. Use a pressure reducing valve if necessary.

Temperature Range—Unless otherwise specified, controller will be furnished with a maximum temperature of 115° F. Hot water line controllers should be so specified and will be set to deliver at a maximum of 135° F.

Discharge—Standard discharge is upward. Specify downward if desired.

Controllers Nos. 1, 3, 4—Are made of bronze, in either plain finish or full chromium or nickel plate. Made in special metals if desired.

Controllers Nos. 5, 6—Are also of brass, chromium or nickel plated, but polished only on machined parts. A rough bronze finish (dipped) can also be supplied. Controller No. 6 can be had in iron body construction with bronze inner parts and aluminum paint finish.

Concealed Piping—When furnished for concealed piping, controller is supplied with polished nickel or chromium plated dial which is mounted as illustrated.

In Ordering—State fully the purpose for which controller is to be used, size and finish of controller, temperature required, and range of adjustment desired; whether for exposed or concealed piping, upward or downward discharge, temperature and pressure of hot and cold water.

SPECIFICATIONS

(1) Water Controllers

(1a) General—Furnish and install *(a)* Powers Thermostatic Water Controller(s) as made by THE POWERS REGULATOR CO., Chicago, Ill., in the following locations:

Note: *Here list and locate the Controllers.*

(1b) Description—Controller(s) shall be No.(s) *(specify.) (Specify finish.) (Specify body for No 6.) (Specify exposed or concealed piping.) (Specify maximum temperature for water delivered.) (Specify locked adjustment.)*

(2) Installations

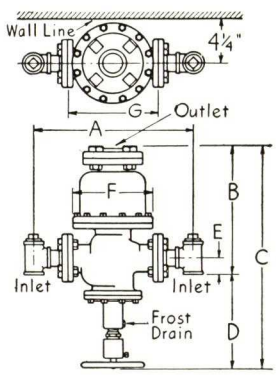
(2a) Place Controller(s) close to fixture.

(2b) Provide stop valves in hot and cold water supplies.

CAPACITIES AND PRINCIPAL DIMENSIONS—Capacities are based upon 40 lbs. water pressure, both hot and cold

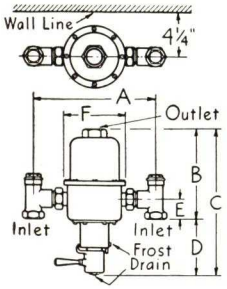
(For greater capacities up to 2500 gals. per min. use Powers No. 10 Thermostatic Three-Way Mixing Valve described in Bulletin No. 258)

No.	Capacities		Connections, in.		Dimensions for exposed piping, inches							Dimensions for concealed piping, inches				
	Number of shower heads	Gal. p. m.	Inlet	Outlet	A	B	C	D	E	F	G	A	B	C	D	E
1	1 or 2	12	½	¾	9	6⅞	13½	6⅝	1⅜	6⅛	.....	9	5½	4 15/16	3⅛	1⅜
3	4	22	¾	1	10½	7⅛	13⅝	6½	1⅝	6⅛	.....	10½	5½	4 15/16	3⅛	1⅝
4	8	40	1	1¼	12¼	8⅝	14 11/16	6 1/16	2	6⅛	.....	12¼	6⅝	4 15/16	3⅛	2
5	20	100	1¼	1½	16	13 1/16	22⅜	9 5/16	1¾	8⅛	9	16	11 5/16	7 1/16	4	1¾
6	25	125	1½	2	16¾	13¼	22⅜	9⅛	1 15/16	8⅛	9	16¾	11 5/16	7 1/16	4	1 15/16



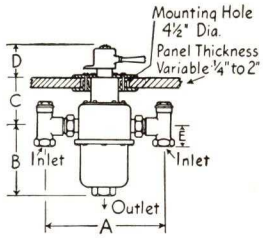
Nos. 5 and 6 for Exposed Piping

FOR EXPOSED PIPING

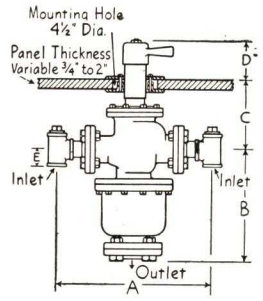


Nos. 1, 3 and 4 for Exposed Piping

FOR CONCEALED PIPING



Nos. 1, 3 and 4 for Concealed Piping



Nos. 5 and 6 for Concealed Piping

INCORPORATED 1889

SPEAKMAN COMPANY

Showers, Flush Valves and Brass Plumbing Fixtures

WILMINGTON, DEL.

Products

SPEAKMAN SHOWERS for all classes of buildings; COMBINATION FIXTURES for bathtubs, lavatories and sinks; FLUSH VALVES; also other Brass Plumbing Material.

Regular finish is Speakman Chromium Plate which, because of its non-tarnishing qualities, is the most practical finish for plumbing fixtures. Nickel Plate and other finishes can be furnished when specified.

Facilities

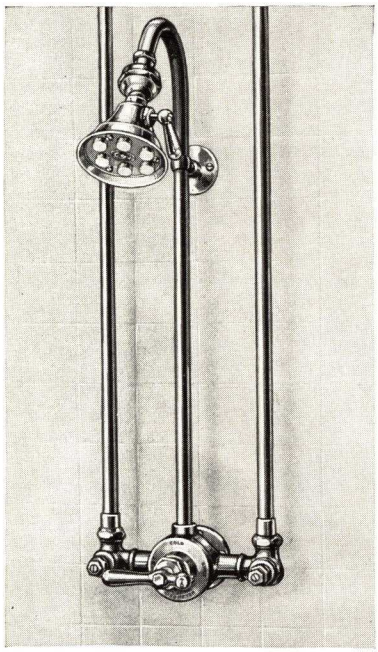
SPEAKMAN COMPANY'S factory is modernly equipped, including Engineering Department. It has ample capacity to handle large orders. For sixty-eight years this company has built a reputation for efficient, dependable and prompt service.

Prices

Wholesale plumbing supply dealers and plumbing contractors throughout the United States can immediately furnish estimates and quote prices on Speakman products.

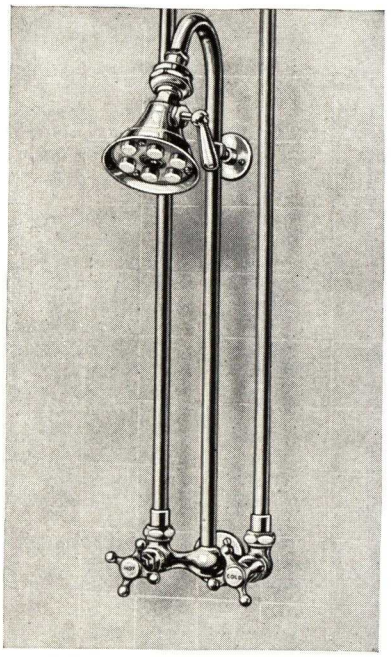
Information

SPEAKMAN COMPANY'S Catalog "K" contains illustrations and specifications on many more types of showers and fixtures. Of special interest to architects, engineers and contracting engineers are Catalogs "K-1" on showers and fixtures for institutional and industrial installations, and "K-2" on the Si-Flo Flush Valve. Copies of the above catalogs will be sent upon request.



K-2676-M. Speakman Institution Mixometer Shower

½-in. size, with screwdriver corner controlling valves in supplies from overhead. Gooseneck discharge pipe with supporting flange, ball joint and Anystream self-cleaning head. For use in a stall or in an open battery



K-2686-M. Speakman Institution Columbia Shower

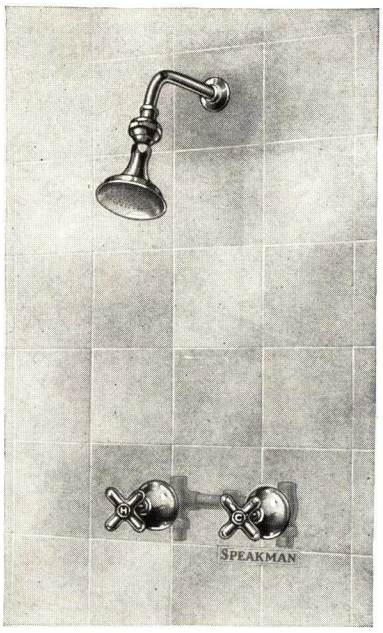
½-in. size. Metal handles. Supplies from overhead. Gooseneck discharge pipe with supporting flange, ball joint and Anystream self-cleaning shower head

K-2601-M. Speakman Built-in Mixometer Shower

½-in. size. Mixometer with metal wall plate and handle. Bent arm, metal flange, ball joint and Anystream self-cleaning shower head

K-4039-M. Speakman Mixometer Shower and Tub Combination

½-in. size. Hi-seat valves with unions, renewable seats, metal escutcheons and metal handles. Mixometer with metal wall flange and metal handle. Act-Easy pop-up waste. Bent arm with metal wall flange, ball joint and Anystream self-cleaning shower head



K-2635-M. Speakman Built-in Heavywate Shower

½-in. size, with Hi-seat valves having unions, renewable seats, metal escutcheons and handles. 4-in. cast brass head with ball joint, bent arm and metal wall flange.

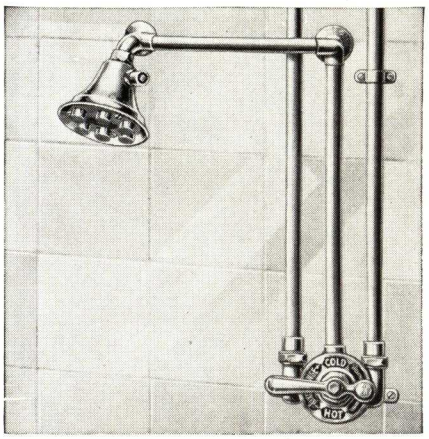
K-1 Catalog

Of special interests to Architects is Catalog K-1, which describes and illustrates Speakman Showers and Fixtures especially adapted to institutions and industrial installations. Copies will be sent only on request.

K-2 Catalog

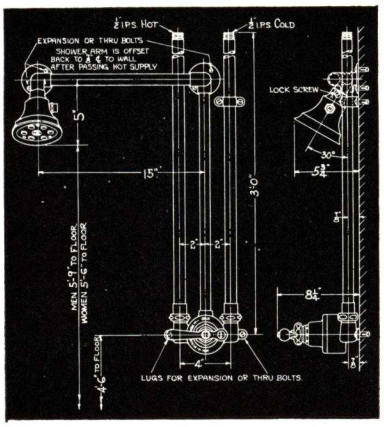
Showing a complete line of Si-Flo (Silent) Flush Valves and accessories adaptable for the requirements of sanitary plumbing and allied uses. Copies will be sent only on request.

SPEAKMAN SHOWERS FOR SCHOOLS AND INSTITUTIONS



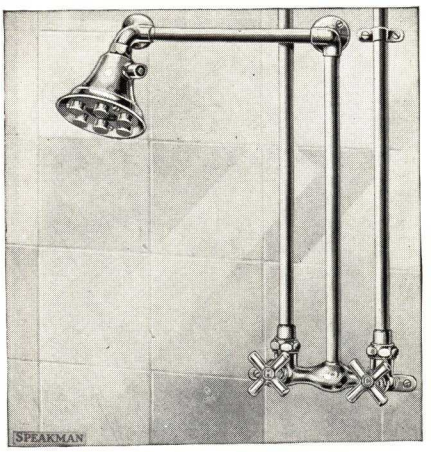
K-3110. Speakman Mixometer Shower—Exposed Type

Size ½ in. Mixometer with cast wall lugs and metal lever handle. Supplies to overhead 36 in. long. Horizontal discharge arm setting head 15 in. off center. Close fitting flanged elbow at each end of arm. Anystream Self-cleaning head with lock-shield control set at 30° angle



Roughing-in Measurements for K-3110 Mixometer Shower

Expansion or through bolts not furnished unless specified.



K-3315. Speakman Columbia Shower

Exposed type. Size, ½ in. Compression valves with cast wall lugs and metal handles. Supplies to overhead 36 in. long. Horizontal discharge arm setting 15 in. off center. Anystream self-cleaning shower head with lock-shield control set at 30° angle. Equipped with lock-screw to prevent malicious removal

SPEAKMAN SHOWER HEADS FOR REGULAR AND SPECIAL INSTALLATIONS

All Heads Shown on this Page Finished in Speakman Chromium Plate

K-3395. Speakman Anystream Self-cleaning Shower Head

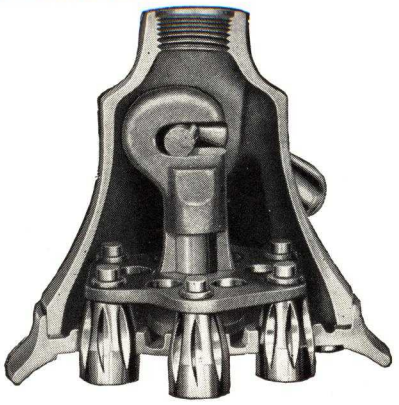
(Patented Jan. 2, 1923 and Nov. 3, 1931)

Size ½ in. with lever handle control. Ball joint not furnished unless specified

K-3396, same as K-3395 but with lockshield arranged to operate by a key

K-3399. Speakman Anystream Self-cleaning Wall Type Shower Head

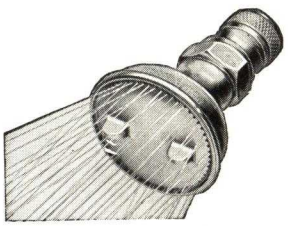
With ½-in. iron pipe female inlet in center of back, supplied with and operated by a $\frac{5}{16}$-in. hexagon wrench



K-3395. Speakman Anystream Self-cleaning Head

(Pat. Jan. 2, 1923 and Nov. 3, 1931)

Has six tapered plungers, each having eight tapered grooves which are moved in and out by the lever handle permitting the bather to enjoy all degrees of shower volume and force. The head can never stop up.

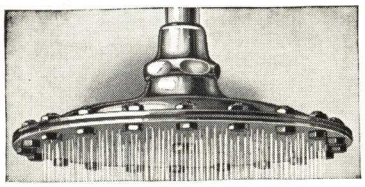


K-7047. Speakman Adjusta-Spray Shower Head

With integral ball joint having ½-in. i.p. inlet.

K-7046, same as K-7047 but less ball joint.

K-7048, same as K-7047 but with lever handle volume control

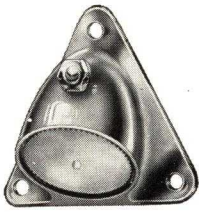


K-3415. Speakman Cast Brass Club Shower

Has 12-in. bolted face. 1-in. iron pipe female inlet. This type has proved very popular for club installation

Shower Head Circulars

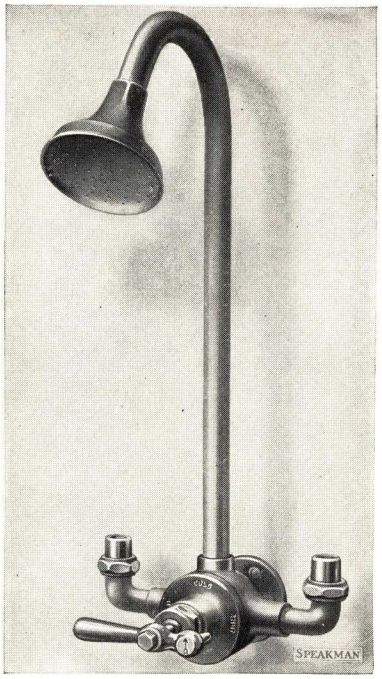
For complete information on the Anystream Self-cleaning Shower Head, send for Circular K-93. Full information and illustrations on our Adjusta-Spray Shower Head will be found in Circular K-69-A.



K-7052. Speakman Wall Type Adjusta-Spray Shower Head

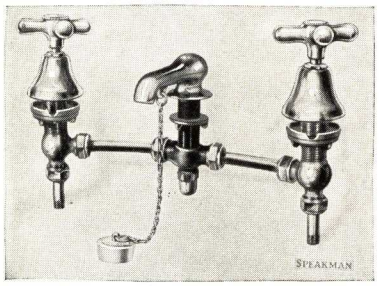
This type is known as the vandal-proof head. Shown with ½-in. iron pipe inlet for concealed supply. Can be furnished with right or left-hand exposed supply. Hexagon wrench is furnished to operate head

K-7053, similar to K-7052 but with volume control



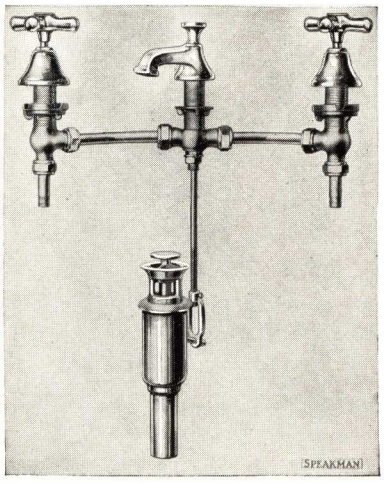
K-3200. Speakman Industrial Shower

Size, ½ in. Mixometer with wall flange and metal handle. Elbow couplings to connect to supplies



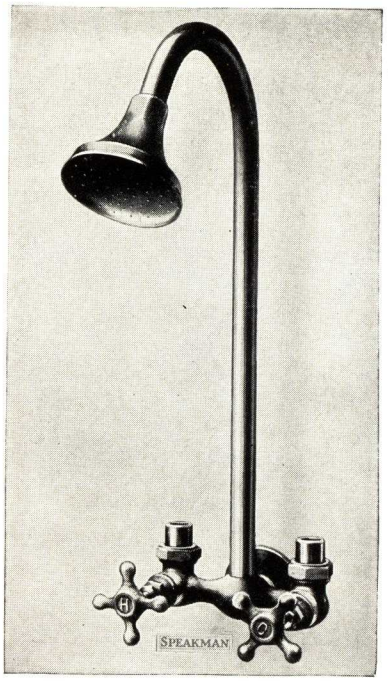
K-5130. Speakman P. and C. Lavatory Fixture

Raised nozzle with extra heavy chain and heavy rubber stopper. Valves with ¼-in. threaded tails, renewable seats, swivel discs, encased washers, metal escutcheons and metal handles



K-5015. Speakman Unit-Acto Lavatory Fixture

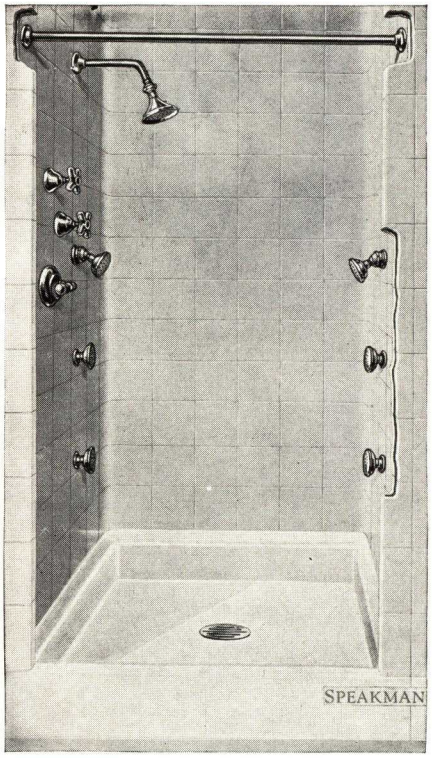
Metal escutcheons and metal handles. Raised nozzle 4½ in. long. Valves with ¼-in. threaded tails, renewable seats, swivel discs and encased washers. Pop-up waste, 1¼-in. size



K-3210. Speakman Industrial Columbia Shower

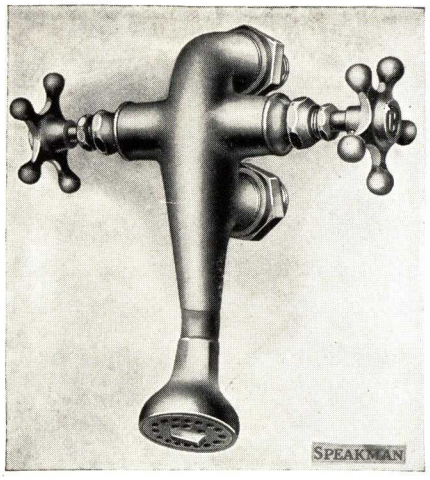
Size, ½ in. Elbow couplings to take supplies from overhead. Four-arm, metal-indexed handles. Renewable seats. Galvanized iron gooseneck discharge pipe with 4-in. cast brass head. Inlets 5 in. center to center

Built-in Needle Shower Bath



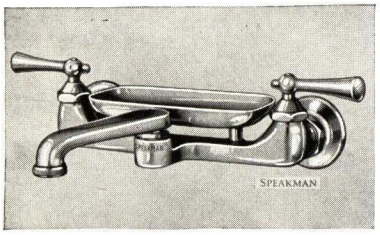
K-2920-M. Speakman Built-in Mixometer Shower and Needle Bath

Size, ¾ in. Mixometer with unions, check valves, china wall plate and china handle. Six cast brass sprays. The top sprays adjustable. Bent arm with china escutcheon, ball joint and 5-in. cast brass head



K-3230. Speakman Industrial Wash-up Fixture

Size, ¾ in. Male union couplings 3 in. center to center. Heavy pattern combination valve with bonnet and packing nut, swivel disc, encased washer, heavy spindle and metal indexed handle. 2-in. cast brass spray head with volume regulator

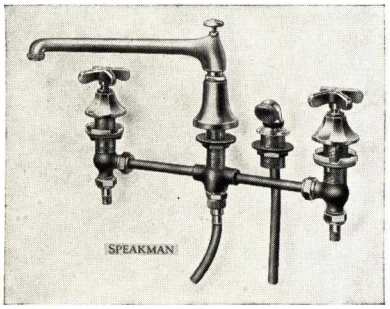


K-5503-M. Speakman Graceline Sink Fixture

(Design patented.) Furnished with ½-in. male connections.* Adjustable threaded flanges. Inlets, 8 in. center to center. Removable metal soap dish. Adjustable metal lever handles. Renewable seats. Swinging non-splash nozzle.

K-5508-M Speakman .Graceline Sink Fixture with Transfer Valve, Spray Head and Disappearing Hose. Furnished with ½-in. male connections.* Adjustable threaded flanges. Inlets 8 in. center to center. Removable metal soap dish. Adjustable metal lever handles. Renewable seats. Swinging non-splash nozzle

**Note:* Sink fixtures can be furnished with female connections when so ordered.



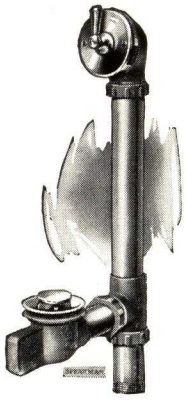
K-5509. Speakman Shelf Type Sink Fixture with Transfer Arrangement, Hose and Spray Attachment

Metal escutcheons and four-arm metal handles. Valves, 8 in. center to center. Elevated swinging nozzle 8½ in. long. Valves have ¼-in. i. p. threaded tails, renewable seats, swivel discs and encased washers.

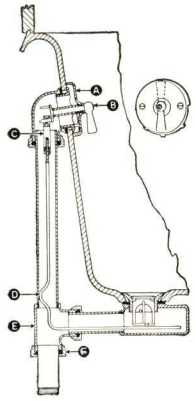
K-5511, same as K-5509 but less transfer valve, hose and spray

K-4585-M. Speakman Metaline Waldin Tub Combination

Size, ½ in. Hi-seat by-pass pattern valves with integral stops, unions, renewable seats in valves, metal escutcheons with openings to operate stops with screwdriver. Metal handles with black enamel indexes. Metal nozzle over tub. Act-Easy pop-up waste, 1½-in. size

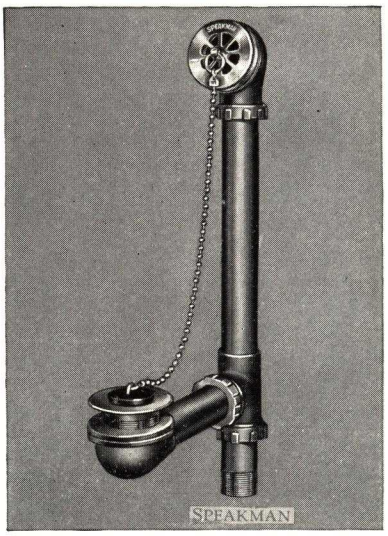


K-4656. Speakman Act-Easy Pop-up Bath Waste



K-4656. Speakman Act-Easy Pop-up Bath Waste in Detail

Size, 1½ in. For built-in tub. Slip connections with metal expansion ring. Slip nut for tail has 1½-in. iron pipe thread, so nut and tail can be discarded and iron pipe size connection used if desired. Waste tee can be reversed, bringing the outlet parallel with the arm for shallow floor construction. Full overflow area through slots around edge of overflow cover. Adjustment made by removing overflow cover. No wall panel required. Easy to install. Nothing to stick or get out of order. Can be furnished in 2-in. size when specified



K-7043. Speakman Heavy Pattern Concealed Connected Waste and Overflow

With heavy cast brass overflow grate with integral shank that screws into the overflow elbow. Chain is beaded, anchored in overflow strainer and rubber stopper. Made in 1½ and 2-in. sizes. Especially recommended for hotels and public places where fixtures get hard usage

SPEAKMAN SI-FLO FLUSH VALVE

"It Eliminates the Noise That Annoys"

K-9000. Speakman Si-Flo Closet Flush Valve

Has 1-in. capped angle stop for right or left inlet, wall flange, metal oscillating handle, flush connection, spud coupling nut and flange for 1½-in. top supply

The Speakman Si-Flo Flush Valve was developed to provide an efficient means of water control for water closets and other fixtures requiring an automatic closing valve, which would eliminate noises heretofore associated with flush valve operation. These noises, which are not only annoying and irritating, are oftentimes embarrassing. The Speakman Si-Flo Flush Valve is the first and only quiet-operating flush valve on the market.

In operation—even with the supply pressure up to 100 lbs. per sq. in.—it only whispers. Its installation in schools insures no more interrupted classes, in hotels no broken rest or slumber for the guests, in hospitals no disturbed or annoyed patients, in apartments no more interrupted conversations or broken sleep, and in the home no more annoyance or embarrassment for the host or guest.

The Si-Flo Flush Valve will eliminate:

1. Line Noise
2. Throttling Noise
3. Closing Noise
4. Water Hammer

In addition to eliminating audible and annoying noises the Si-Flo Flush Valve has made repair of flush valves simple and easy.

SI-FLO PISTON UNIT

The piston unit of the Si-Flo Flush Valve (illustrated) contains all of the working or wearable parts of the valve, except the handle assembly

In case repair becomes necessary the replacement of this piston unit constitutes a complete repair of the valve and can be replaced by an inexperienced mechanic in five minutes time.

The piston is made of a hydraulically moulded composition noted for its long wearing qualities and resistance to solvents, alkalis, and acids.

The cup leather is hydraulically formed and treated so that it will retain its shape and pliability indefinitely.

SI-FLO FLUSH VALVE FOR URINALS

K-9072 Speakman Chromium Plated Urinal Si-Flo Flush Valve for syphon jet and pedestal urinals with 1-in. capped angle stop for right or left supply inlet, wall flange, 20 percent nickel white metal oscillating handle, flush connection, spud coupling and flange for 1¼-in. top supply wall hung syphon jet or blowout urinal.

THE EBCO MANUFACTURING CO.

Manufacturers of Ebco Dish Washing and Circular Wash Sinks

COLUMBUS, OHIO

AGENCIES IN ALL PRINCIPAL CITIES

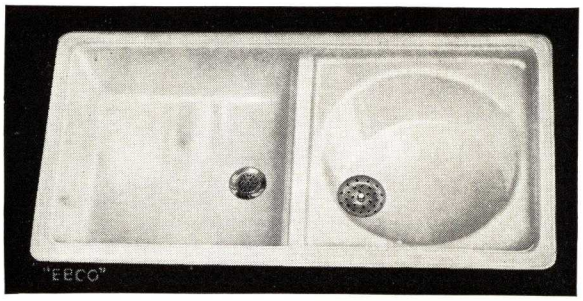
For Toilet Partitions, Drinking Fountains and Fountain Glass, Iced Water Coolers, see File Index

Ebco Top Sinks

These sinks are designed for kitchen cabinet or built-in jobs, either linoleum or tile. They are available in white or colored enamel, regular or acid-resisting.

Accessories include Ebco Twin Waste Fitting with large crumb cup, rubber dipped drain basket, and special Ebco Swing Spout Faucet with concealed hose spray to disappear in sink back or top.

All the exclusive features of high priced modern sinks are inherent in Ebco Top Sinks, at a reasonable cost. No substitute ever discovered equals the utility of a good cast iron enameled sink.



Ebco Top Sink

Model LR-141
Size 39¼x20⅛ in.

Model LR-131
Size 30x18 in.

Ebco Zephyr Cabinet Sinks

These modern sinks combine new beauty with unsual convenience and economy. They include these new Ebco features:

Built-in round dish pan for washing; built-in rinsing and drying compartment; built-in soap dish and tumbler rests.

Faucets are concealed and have "finger tip" control. Spout has long swing. Pistol-grip spray has disappearing hose and self-adjusting head with renewable spray disc. Tempered water is available from either spout or spray. Escutcheons are easily raised for cleaning. The extra large lift-out cup in the Duo-Strainer is chrome plated.

The large deep drawers roll on ball bearings. Sink height is adjustable. There is ample toeroom under front of cabinet. Hardware is solid bronze, chrome plated.

Made in two sizes: 60 in. wide x 25 ft. 2 in. deep x 42 in. high and 42 in. wide x 25 ft. 2 in. deep x 42 in. high.

Ebco Zephyr Cabinet Sinks

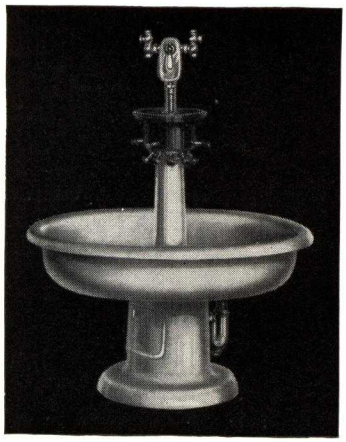
The Ebco Circular Wash Sink

The Ebco Circular wash sink is the modern, sanitary, group washing fixture. The Ebco Circular Wash Sink conserves floor space, conserves water, as each spray head is an integral stop valve—reduces maintenance as service is negligible and the smooth curved surfaces of the receptor and column are easily kept clean. The chromium plated parts require only an occasional wiping to retain their brilliancy and beauty.

Complete Wash Up Possible Without Splash—The individual spray heads are 8½ ins. above the 10 in. deep receptor, permitting the users to wash heads and shoulders without splash.

Finish and Equipment—The receptor, column, and pedestal are vitreous enameled in white or colors. Soap trays and liquid soap container in black vitreous enamel. All exposed fittings — brass chrome plated. The 2-in. trap is galvanized and readily accessible. Models equipped with supply and vent from overhead or below—include screen, stop valves, pressure regulating and temperature control valve.

Write for Bulletin WS showing all models and sizes.

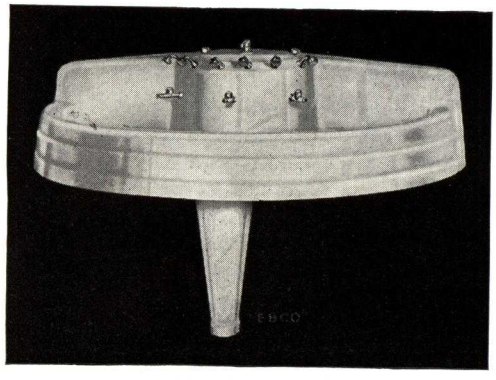


Model D-251

GENERAL DIMENSIONS

Persons	Diam. receptor, in.	Diam. base, in.	Depth receptor, in.
6	36	22	8
10	54	27	10

Height, floor to top receptor, 30 in.
Note: Special height for juveniles, 24 in., on order.



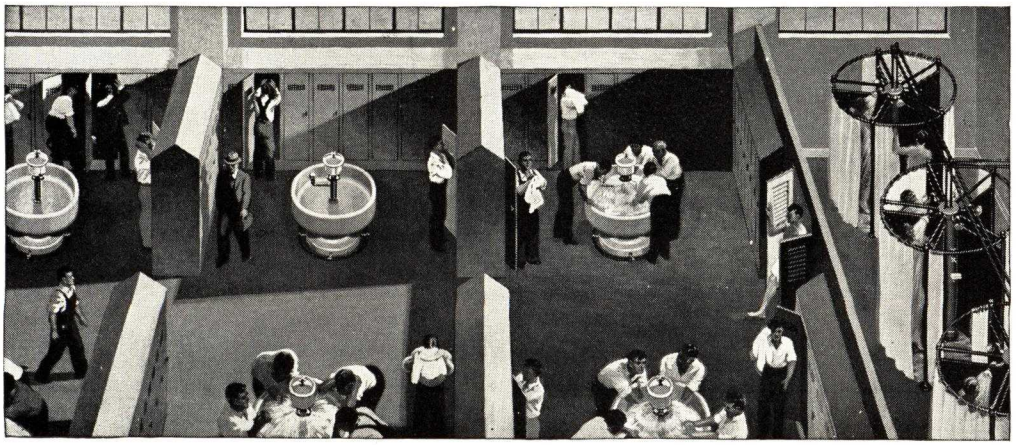
Ebco Semi-Circular

For narrow washrooms, halls or other limited spaces. 60-in. width for 6 persons. 36-in. width for 3 persons. Individual spray heads, temperature control, automatic pressure regulation same as on all full round Ebco models

BRADLEY WASHFOUNTAIN CO.

Manufacturers of Group-Washing Equipment
2209 West Michigan Street, Milwaukee, Wis.
Representatives in All Principal Cities of the United States and Canada

THERE'S A BRADLEY GROUP-WASHING FIXTURE FOR EVERY GROUP-WASHING REQUIREMENT



An Ideal Washroom Layout Showing Bradley Washfountains and Group Showers
Note Drinking Bubbler attachments on two of the Washfountains

Advantages

Quick, low-cost installation
Only 3 plumbing connections
Water economy
Improved sanitation
Reduced janitor labor
Extraordinary durability

Bradley Soap Dispenser
Available for powdered or liquid soap

Side-stream Drinking Fountain

BRADLEY WASHFOUNTAINS

Bradley Washfountains are expressly designed for the group-washing requirements of modern industrial plants, schools and institutions of all kinds.

MATERIALS

Bradley Washfountains are available in:
Precast Marble or Stone: Marmorite, marble composition; white, tinted, or variegated colors. *Granito,* non-porous stone composition; attractive sand shade. *Bradstone,* construction similar to Granito, unground; burnt-umber color.

Stainless Steel
Porcelain
Enameled Pressed Iron
Chemical Stoneware

EQUIPMENT

Standard equipment includes chromium plated cake soap tray and Bradley mixing valve. Special soap dispensers, thermostatic mixers and sectional sprayheads may be had if desired.

Semi-circular Enameled Pressed Iron Washfountain

BRADLEY GROUP SHOWERS

Bradley Group Showers, like Bradley Washfountains, are designed for modern group service and have been widely adopted by industrial concerns, schools and institutions. They are available in circular and semi-circular models serving 5 and 3 users, respectively.

SPECIFICATIONS

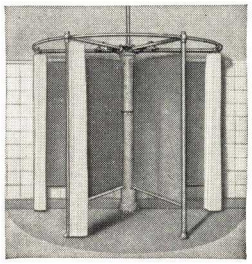
Central column and all frame members of cold-drawn seamless steel tubing. Standard partitions of patent leveled cold-rolled 16-gauge steel. Finished in gray high temperature baked synthetic enamel. Fittings of heavy chromium plated brass, satin finish. Equipment includes white duck curtains. Supply connections from above or below. Also available in combination with dressing rooms—two dressing rooms for each shower stall.

SPECIFICATIONS OF BRADLEY WASHFOUNTAINS

Type	Characteristics	Design	Dia., in.	Capacity	Remarks
A	Hand-controlled. Supplies and vent from below.	Circular	54 .. 36	10 users ..... 6 users	All piping connections are concealed.
B	Hand-controlled. Supplies and vent from above.	Circular	54 .. 36	10 users ..... 6 users	Popular for remodeling jobs.
C	Hand-controlled. Supplies and vent through wall or floor.	Semi-circular	54 .. 36	6 users ..... 3 users	Wall type for narrow or irregular washrooms.
D	Foot-controlled. Supplies and vent from below.	Circular	54 .. 36	10 users ..... 6 users	Foot-control of water flow assures maximum sanitation and water-saving.
F	Foot-controlled. Supplies and drain through wall or floor.	Semi-circular	54 .. 36	6 users ..... 3 users	Similar to "C," plus foot-control.
G	Hand-controlled. Supplies and drain through wall or floor.	Semi-circular	54	6 users	Available in enameled iron and stainless steel.
H	Hand-controlled. Supplies from below, vent from above.	Circular	54 .. 36	10 users ..... 6 users	All piping connections concealed except central vent.
J	Foot-controlled. Supplies from above, vent from below.	Circular	54 .. 36	10 users ..... 6 users	Similar to "O" but with foot-control.
O	Hand-controlled. Supplies from above, vent from below.	Circular	54 .. 36	10 users ..... 6 users	Popular for remodeling.
R	Foot-controlled. Supplies and drain through wall or floor.	Semi-circular	54	6 users	Available in enameled iron and stainless steel.
W	Hand-controlled. Supplies and vent through wall or floor.	Semi-circular	54 .. 36	6 users ..... 3 users	Wall type. Alternate to "C."

OTHER FIXTURES

The Bradley line also includes Foot Fountains, Drinking Fountains (see illustration above) and Street and Playground Showers.



Semi-circular Bradley Group Shower

CENTURY BRASS WORKS, INC.

Manufacturers of Automatic Stream Control Drinking Fountains

BELLEVILLE, ILLINOIS

Century Automatic Stream Control

All the fountains listed are equipped with the *new* No. 700 Century Bubbler Head which completely eliminates the difficulty experienced in drinking from fountains of the ordinary type, because it automatically controls the height of the stream and volume of water used without waste of water, and regardless of water pressure. This new-day bubbler fully meets all the requirements of the American Public Health Association. Every mechanical guard to stop the spread of disease has been incorporated.

Colored Ware

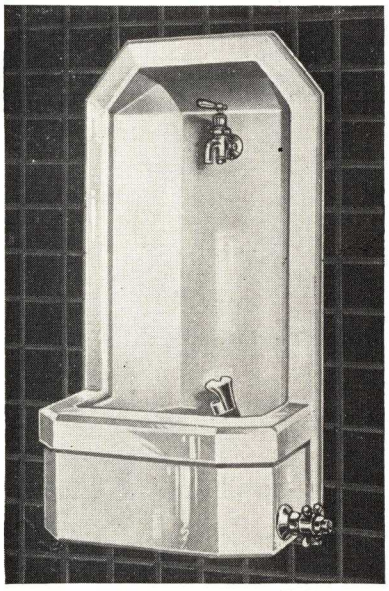
Century Fountains can be regularly furnished in the following stock colors to harmonize with practically any interior finishes; blue, light green, light brown, black, orchid, light buff and old ivory.

Facilities

The twice fired vitreous chinaware and cast iron porcelain enameled ware are made to Century exclusive designs and specifications by two of the country's largest manufacturers—specialists each, in their particular line and nationally known for the high quality of their products. All the metal parts of exclusive Century design are completely made and assembled in the Century plant.

Catalog

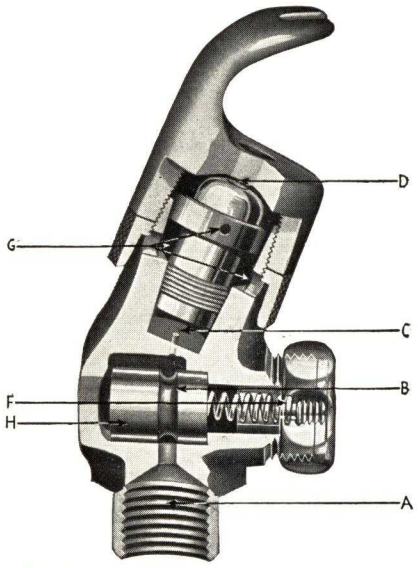
Send for complete catalog.



No. 6-48-F Semi Recessed Wall Fountain Vitreous China

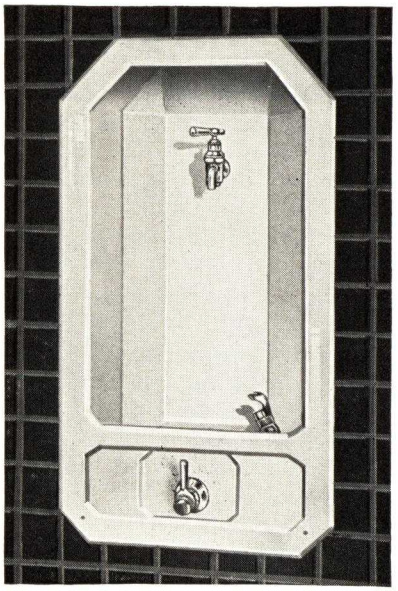
Completely closed integral trap housing, brass strainer, cast brass supply connection with self-closing stop-cock, union connection for ⅜-in. I. P. supply, adjustable cast brass trap with cleanout plug for 1¼-in. I. P. outlet, self-closing lever handle glass filler through back of fountain. All exposed fittings, chromium plated.

Dimensions — Width over all, 15½ in; height over all, 27 in.; recessed depth, 4½ in.; projection from wall, 7 in.



The Century No. 700 Automatic Bubbler

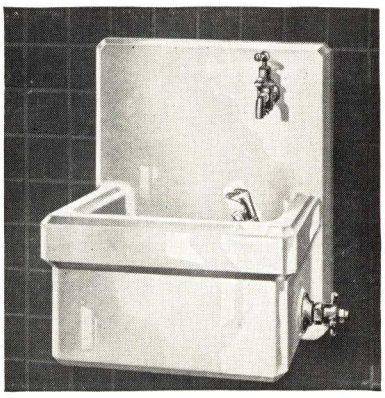
Cross section of the new No. 700 Century Bubbler Head showing how positive prevention of water waste is assured by passing the water through four stages of pressure "A," "B," "C" and "D" controlled by Piston "H." Parts "G" remain open to guard against any opposing pressure on the piston and delivery of water is regulated by adjusting screw "F"



No. 6-49-F Full Recessed Wall Fountain Vitreous China

Cast brass connection for ⅜-in. I. P. supply, loose key stop, 1½-in. New York regulation trap and cleanout plug easily accessible through metal wall flange. Self-closing lever handle, glass filler through back of fountain. All exposed fittings, chromium plated.

Dimensions—Width over all, 17 in.; height over all, 30½ in.; recessed depth, 10½ in.; receptor opening, 13 in. wide by 21 in. long by 9 in. deep.



Left: **No. 6-47-F Vitreous China Wall Fountain**

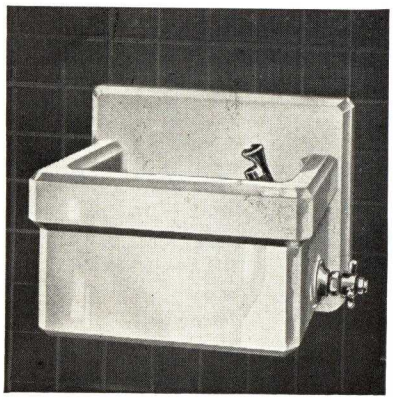
18-in. integral back and trap housing, glass filling faucet, concealed wall hanger, cast brass connection for ⅜-in. I. P. supply, self-closing stop cock, brass strainer, cast brass trap with cleanout plug for 1¼-in. waste, chromium plated fittings.

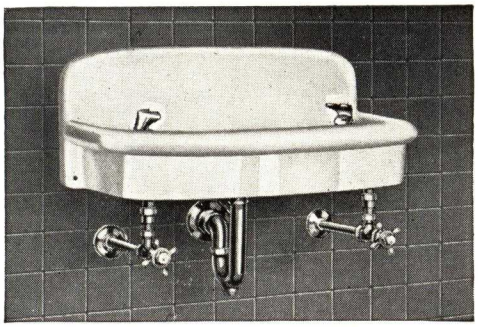
Dimensions—Height over all, 18 in.; width, 15 in.; depth of receptor, 3½ in.; wall to stream, 9 in.; wall to front, 12½ in.

Right: **No. 6-47-A Vitreous China Wall Fountain**

12-in. integral back and trap housing, cast brass connection for ⅜-in. I. P. supply, concealed wall hanger, self-closing stop cock, brass strainer, cast brass trap with cleanout plug for 1¼-in. I. P. waste, chromium plated fittings.

Dimensions—Height over all, 12 in.; width, 15 in.; depth of receptor, 3½ in.; wall to stream, 9 in.; wall to front, 12½ in.





No. 6-41 Vitreous China Wall Fountain

Integral back, concealed wall hangers and bolts, cast brass supply connections with self-closing cocks, ⅜-in. I. P. supplies to wall, loose key stop, brass strainer, 1¼-in. brass P trap and waste to wall, chromium plated fittings.

Dimensions—Depth of trough, 4¾ in.; wall to stream, 9 in.; length over all, 24 in.; wall to front, 14½ in.; height at back, 10½ in.

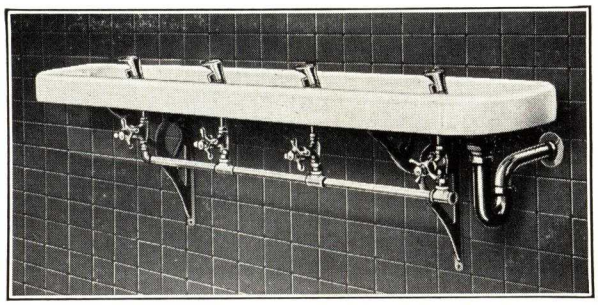
No. 6-42 Vitreous China Wall Fountain

Integral trap housing, concealed adjustable wall hanger, wall bolts, cast brass union connection for ⅜-in. I. P. supply, brass strainer, cast brass trap with cleanout plug for 1¼-in. I. P. outlet, chromium plated fittings.

No. 6-44—Same as 6-42, except with removable metal plate enclosing trap housing to prevent condensation.

Dimensions—Receptor, 13x10 in.; depth of receptor, 3½ in.; width over all, 13 in.; wall to screen, 8 in.; wall to front, 13 in.

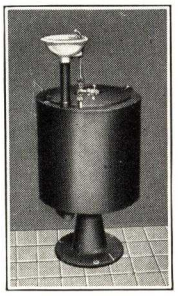
CENTURY PORCELAIN ENAMELED FOUNTAINS



No. 6-67 Wall Fountain with Painted Iron Brackets

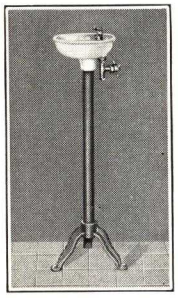
Made with 2, 3 or 4 bubblers, cast brass supply connections, self-closing stop cocks, loose key stop, ⅜-in. I. P. continuous supply from wall, brass strainer, 1¼-in. brass P trap and waste to wall. All exposed fittings chromium plated.

Dimensions—Depth of trough, 2½ in.; wall to drinking stream, 8 in.; width, 30, 44 or 55 in.; wall to front of fountain, 11 in.



No. 6-401 Ice Cooled Fountain

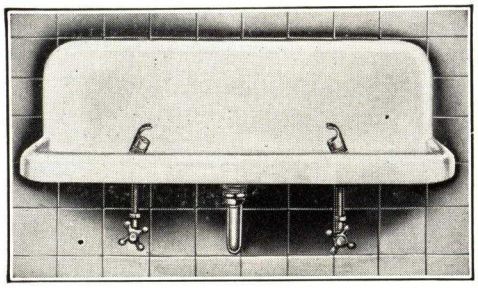
Combination cooler tanks and drinking fountain particularly adapted to buildings where there is no refrigerating plant for cool water supply. Made in various sizes.



No. 6-39 Pedestal Fountain

Self-closing stop cock, brass strainer, 1¼-in. I. P. drain, all exposed brass fittings chromium plated and iron painted gray.

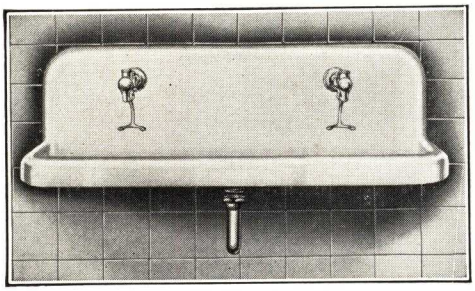
Dimensions—Receptor, 10x7 in.; depth of receptor, 3 in.; height, 36 or 39 in.; base (tripod), 13 in.; base (round), 11 in.



No. 6-60 Wall Fountain with Integral Back

Painted iron brackets and concealed wall hangers, cast brass supply connections with self-closing stop cocks, ⅜-in. brass supply from wall with branches to stops, brass strainer, loose key stop, 1¼-in. brass P trap and waste to wall. All exposed fittings chromium plated.

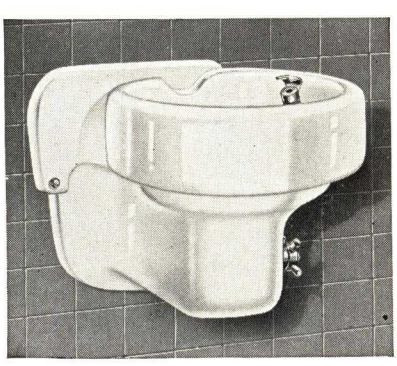
Dimensions—Depth of trough, 2½ in.; wall to stream, 8 in.; width 36 in.; wall to front of fountain, 14¼ in.; height at back over all, 11 in.



No. 6-68 Wall Fountain

Porcelain enameled, cafeteria fountain, with integral back. Equipped with two glass fillers through back, brass strainer, painted iron brackets, regulation 1¼-in. brass trap, with clean-out plug. Concealed wall hanger. All exposed fittings chromium plated.

Dimensions—Length, 36 in.; height of back, 11 in.; wall to front of fountain, 14½ in.



Left:

No. 6-69 Wall Fountain

Cast iron, porcelain enameled fountain with completely closed integral trap housing which is removable for easy access to supply and waste fittings. Equipped with concealed wall hanger, wall bolts, brass strainer, self-closing stop cock, union connection for ⅜-in. supply, cast brass trap with cleanout plug for 1¼-in. I. P. outlet. All exposed parts chromium plated.

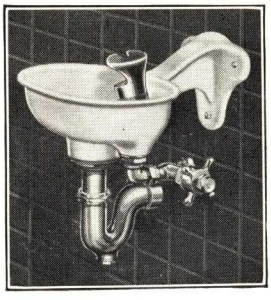
Dimensions—Receptor (oval), 13¼x10 in.; depth of receptor, 3½ in.; width over all, 13¼ in.; wall to drinking stream, 8 in.; wall to front of fountain, 13½ in.

Right:

No. 6-18 Wall Bracket Fountain

⅜-in. I. P. supply, brass strainer, self-closing stop cock, brass trap with clean-out plug, 1¼-in. I. P. waste, exposed fittings chromium plated.

Dimensions—Receptor (oval), 10x7 in.; depth, 3½ in.; wall to front, 12 in.; wall to drinking mound, 8 in.



MEMORANDA

THE EBCO MANUFACTURING CO.

Manufacturers of Ebco Water Coolers

COLUMBUS, OHIO

AGENCIES IN ALL PRINCIPAL CITIES

Products

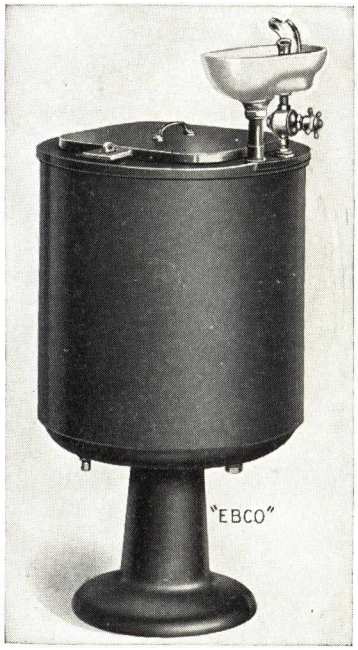
EBCO DRINKING FOUNTAINS: EBCO ICED WATER COOLERS.

For EBCO Dish Washing Sinks, Group Wash Sinks and Steel Toilet Enclosures, see File Index.

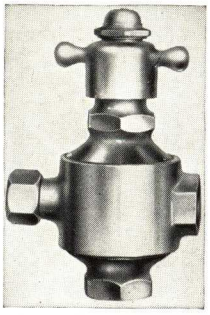
Ebco Water Coolers and Fountains

The modern way of supplying cool, sanitary, and fresh drinking water is economically accomplished by means of EBCO Water Coolers and Fountains. EBCO Fountains feature angle-stream non-squirting bubblers controlled by the automatic stream control valve insuring the convenient and sanitary constant drinking stream. EBCO Fountains meet the specifications of all health and plumbing codes.

EBCO Coolers are modern in design, perfectly insulated and economical to operate. Write for catalog showing entire line of iced type cabinets, also fountains and accessories to meet all requirements.

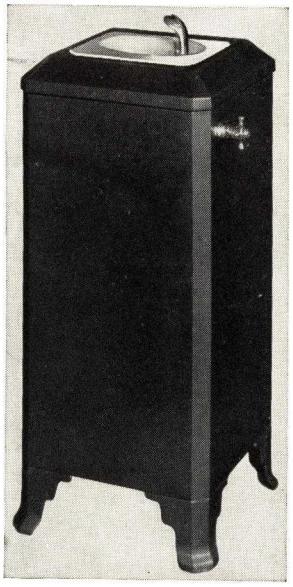


C-271 Ebco Iced Water Cooler
With C-1300 automatic stream control, self-closing valve and angle stream bubbler

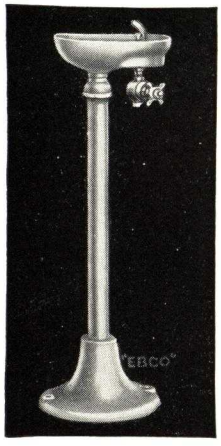


C-1300 Ebco Automatic Pressure Regulating Valve
Over 90% efficient on pressure variations between 25 and 100 lb.

Ebco Model C-112
Equipped with self-closing faucet, waste strainer and tailpiece. Trap to wall. Concealed wall hanger. Width 12 in. Projection 9 in.

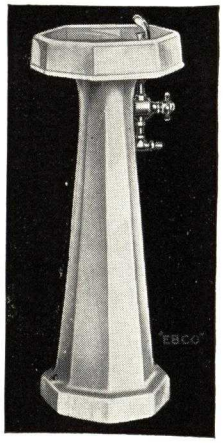


Ebco Model 3-1M
Lift top pressure bubbler iced water cooler
Modern in design

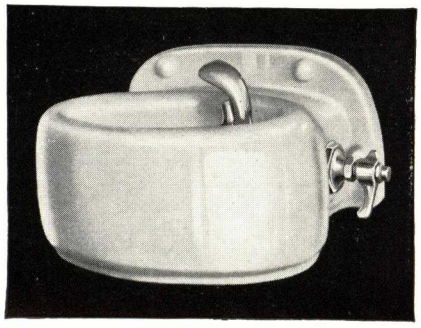


Left:
Ebco Model C-226
Equipped with Pressure Valve, C-1300, angle jet bubbler, guard, waste and supply fittings, and porcelain receptor. Galvanized pedestal and adjustable base
Receptor 5¼ x 10½ in. Heights 30, 36, 42 in.

Right:
C-209 Ebco Vitreous Enameled Pedestal Fountain
Furnished with angle stream bubbler, supply and waste to the floor, and C-1300 automatic stream control valve. Heights 30 and 36 in.



Right:
Ebco Model C-252
Equipped with Pressure Regulating Valve, C-1300 and jet bubbler, guard, waste strainer and tailpiece. Trap to wall. Width 6¼ in. Length 12 in. Projection 12 in.



Left:
C-241 Ebco Vitreous China Wall Fountain
Furnished with angle stream bubbler, C-1400 automatic stream control valve and concealed trap

Left:
Ebco Model C-245
Vitreous enameled wall fountain built to specifications of U. S. Veterans Bureau—concealed trap, angle stream raised bubbler, and pressure control valve are standard equipment

OREGON BRASS WORKS

Manufacturers of Ornamental Drinking Fountains of Bronze, Aluminum and Nickel Silver

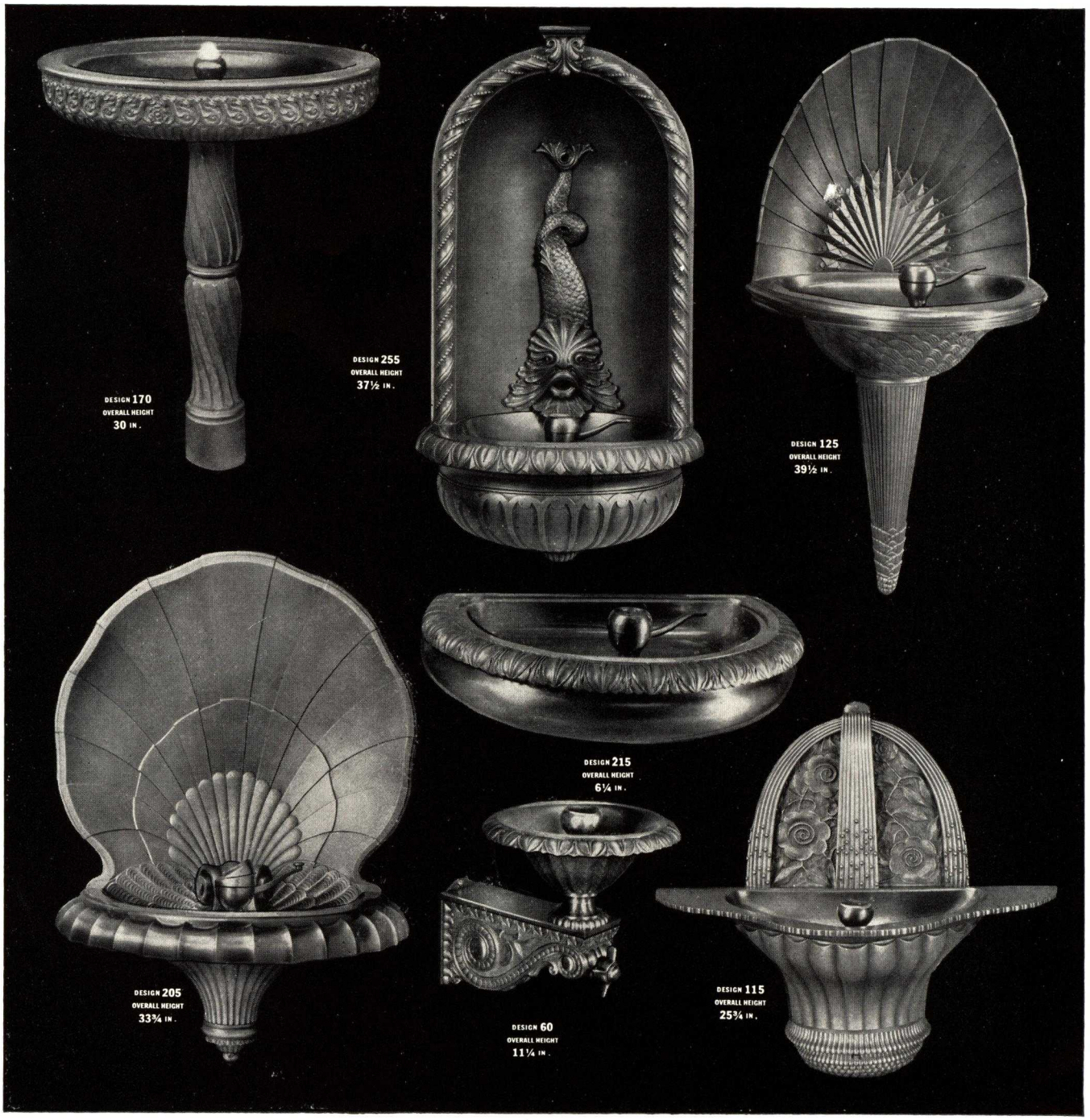
South East 10th and Salmon Streets, PORTLAND, ORE.

ORNAMENTAL DRINKING FOUNTAINS OF HIGHEST QUALITY

We produce the very finest fountains at considerably less than the cost of manufacturing a single fountain of special design. This saving is effected by manufacturing in quantities, and eliminating the designing, modeling and pattern work necessary in producing fountains each of different design. We have designs suitable for any installation.

A letter or telegram will bring installation details and photographs of typical installations.

Our complete line is shown below.



Guarantee

Our fountains are guaranteed in every respect. If not entirely satisfactory, they may be returned at our expense.

Materials and Finishes

Statuary bronze, aluminum and nickel silver. Only the best castings, made from hand chased metal patterns, are used. All coloring is done by chemical processes and not by the use of colored lacquers.

Finishes to match any standard hardware. Sample of finish required should be furnished if possible.

Installed in the Nation's Finest Buildings

Many of the nation's fine public buildings and financial institutions have been beautified by the installation of Ornamental Drinking Fountains manufactured by OREGON BRASS WORKS.

Bubblers

We equip these fountains with our lever operated or constant flow angle stream bubbling cups, or with any type or make of bubblers that will fit these fountains.

Installation

Can be handled by any plumber. Bolts and special fittings are included. Stone bases shown in illustrations are merely suggested treatments and are not included in price or over-all height shown.

Prices

Prices shown are for bronze or aluminum and are net, delivered.

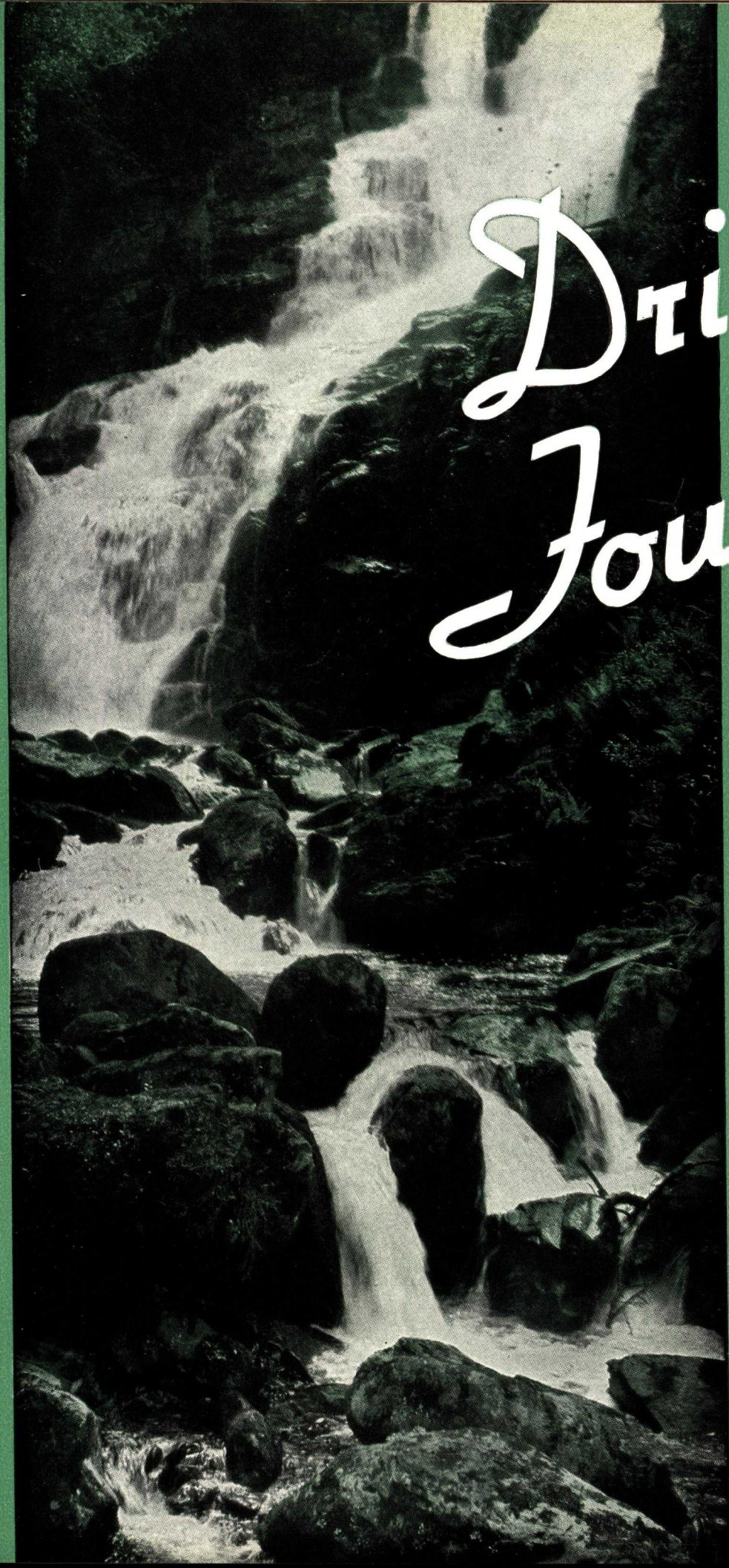
Design 60	$ 60.00	Design 150	$400.00
Design 110	200.00	Design 160	140.00
Design 115	200.00	Design 170	210.00
Design 120	420.00	Design 195	105.00
Design 125	200.00	Design 205	210.00
Design 130	220.00	Design 215	120.00
Design 140	400.00	Design 255	275.00

Prices subject to change.
Add 10% for cast nickel silver or chromium plated bronze.

MEMORANDA

CAT. NO. 380

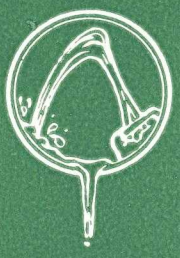
27
89



Drinking Fountains

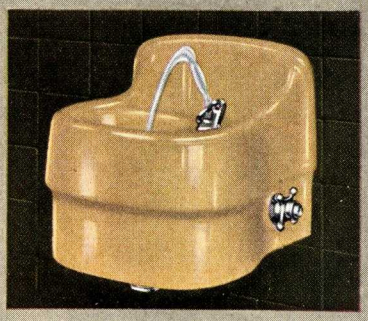
by

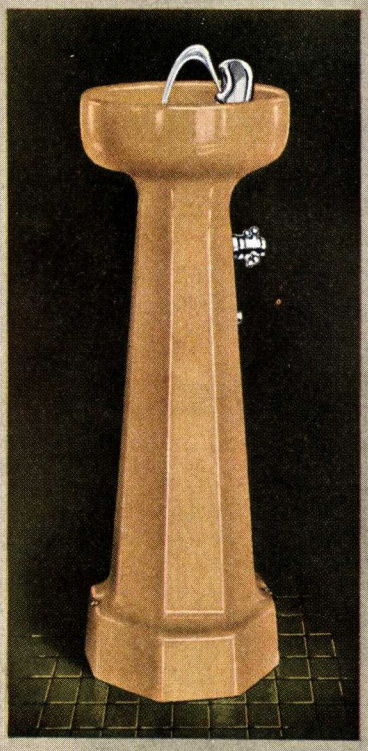
HALSEY TAYLOR



COLOR

The demand for COLOR in vitreous china fountains to match interior decorative treatments can be met with contrast or harmony by the many colors offered in the Halsey Taylor line. We will gladly send you upon request color tiles to guide you in your choice.





Above colors are approximate. Request color tiles.

Foreword

HALSEY TAYLOR DRINKING FOUNTAINS were introduced long before the Great War. It was during the war, however, that they secured governmental approval for use in cantonments because of their sanitary advantages. From that day to this, Halsey Taylor Drinking Fountains have been continually improved and refined until they are today the most modern fixtures you can buy for the purpose. They are ideal for schools, hospitals, hotels, municipal and public buildings and churches. Architects and builders prefer their specifications because of their exclusive advantages in promoting drinking convenience and sanitation.

IN THE FOLLOWING PAGES you will find the various types of Halsey Taylor Fountains described and illustrated. These fountains embody many patented and distinctive features found in no other make or type. Some of these features are:

(1) *Practical Automatic Stream Control* — An automatic device maintains a constant height in the drinking stream even though the line pressure may vary 50 pounds. The stream is never too high, never too low.

(2) *Ideal Drinking Mound* — The 2-stream projector was designed for and adopted by the Government during the war. This exclusive design makes the side stream really practical, and removes the objections found in ordinary side-stream fountains with their hoselike stream.

(3) *Absolute Sanitation* — The drinking mound is formed by the converging of two streams of water — thus setting up an interference forming a localized drinking mound which makes it impractical to drink from any other point. This is sanitary in the extreme. Fingers or lips cannot come in contact with or contaminate the source of supply. It is absolutely impossible to squirt the water.

GENERAL INFORMATION FOR ARCHITECTS

Heights Recommended — For kindergartens, 24-inch; grade schools, 30-inch; high schools, 30 or 36-inch; factories, 36, 39 or 42-inch. For kindergarten, lever handle self-closing stop will be found much easier for smaller children to operate.

Number of Pupils — Experience teaches that one drinking fountain should be provided for each fifty pupils — however, in no case should one fountain be planned to serve more than seventy pupils.

Continuous Flow — Where it is desired to have continuous flow of water, we can furnish a by-pass valve on most types which will permit a small stream of water to flow continuously and a full stream when the self-closing stop is operated.

Finish — Exposed fittings on all fountains with the exception of fixtures Nos. 501 to 515 are furnished in chromium plate. However, we can furnish nickel plate, bronze or polished brass upon request.

Water Consumption — The amount of water required in different classes of installations will vary and, where the actual amount of water required is not known, the following data will give the approximate demand to be expected.

(1) Heavy manufacturing ¼ gal. per hr. per person
(2) Light manufacturing 1/5 gal.per hr. per person
(3) Office building... ⅛ gal. per hour per person
(4) Transients. 1 gallon per hour per 100 persons
(5) Hotels..... ⅛ gallon per hour per room (maximum 1½ gallons per day)
(6) Restaurants.. 1/10 gallons per person served
(7) Cafeteria..... 1/12 gallons per person served
(8) Theatres..... 1 gallon per hour per 75 seats
(9) Schools..... ⅛ gallon per hour per student
(10) Hospitals.... 1/12 gallon per hour per bed (Plus ⅛ gallon per hour per attendant)

Color — All vitreous china fixtures shown in catalog can be furnished in various colors to match the woodwork, marble, or interior trim.

Marble Fountains — Send for roughing-in measurements of Halsey Taylor fittings for marble or terra cotta wall and pedestal fountains.

Blue Prints — Blue prints giving details will be furnished for any fixtures shown.

Vitreous China

WALL DRINKING FOUNTAINS

Halsey Taylor . . . No. 2609

No. 2609

THIS Halsey Taylor Wall Drinking Fountain is made of heavy vitreous china and has integral trap housing. Concealed wall hanger; brass wall bolts; brass strainer; self-closing stop with cross handle; loose key regulator and union connection for ⅜-inch iron pipe supply. Rough brass trap for 1¼-inch iron pipe outlet. *2-stream mound building projector and Taylor automatic stream control.* All exposed fittings chromium plate. Receptor, 10 by 13 inches. Wall to stream, 8 inches.

No. 2601

A POPULAR Halsey Taylor Wall Drinking Fountain. Heavy vitreous china. Integral trap housing; concealed wall hanger; brass strainer; self-closing stop with cross handle; loose key regulator and union connection for ⅜-inch iron pipe supply. Brass trap for 1¼-inch iron pipe outlet. *2-stream mound building projector and Taylor automatic stream control.* All exposed fittings chromium plate.

No. 2602

Same as No. 2601—except without trap, but with waste fitting for drain to wall.

No. 2605

THIS Halsey Taylor model is also heavy vitreous china and has integral trap housing. Concealed wall hanger; brass wall bolts; brass strainer; self-closing stop with cross handle; loose key regulator and union connection for ⅜-inch iron pipe supply. Rough brass trap for 1¼-inch iron pipe outlet. *2-stream mound building projector and Taylor automatic stream control.* All exposed fittings chromium plate. Receptor, 10 by 13 inches. Wall to stream, 8 inches.

No. 2608

Same as No. 2605—except with metal plate trap housing, completely enclosed.

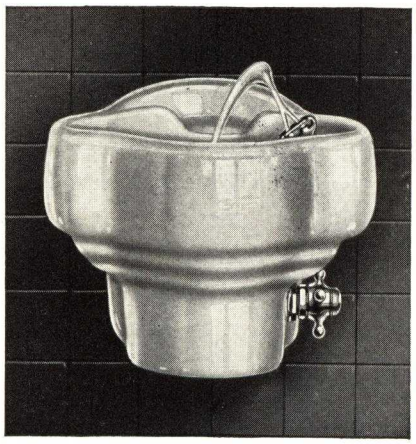
No. 604

BUILT of heavy vitreous china, this wall drinking fountain has completely closed integral trap housing. Concealed wall hanger; brass wall bolts; brass strainer; self-closing stop with cross handle; loose key regulator and union connection. ⅜-inch supply; 1½-inch New York regulation rough brass trap with clean-out plug through trap housing. *2-stream mound building projector and Taylor automatic stream control.* All exposed fittings chromium plate.

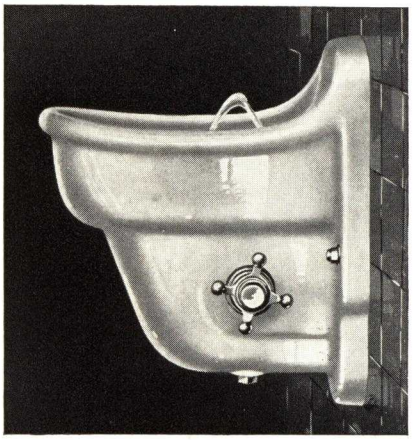
Dimensions . . .

No.	Depth of Receptor, in.	Overall Width, in.	Projection from Wall, in.	Supply, in.	Waste, in.	Weight, lbs.
2609	3½	13	13¼	⅜	1¼	45
2601	3	12	11¼	⅜	1¼	37
2605	3½	13	13	⅜	1¼	41
604	3½	9½	12	⅜	1½	35

Halsey Taylor . . . No. 2601



Halsey Taylor . . . No. 2605



Halsey Taylor . . . No. 604

Recessed and Semi-recessed
WALL DRINKING FOUNTAINS

No. 2646

THIS Halsey Taylor Wall Drinking Fountain is beautifully proportioned. Heavy vitreous china. Brass strainer; self-closing lever handle stop; loose key regulator for ⅜-inch iron pipe supply; 1½-inch New York regulation trap with clean-out and metal wall flange. Equipped with push button glass filling faucet through back. *2-stream mound building projector and Taylor automatic stream control.* All exposed fittings chromium plate. Receptor opening, 12½ by 20¾ inches.

No. 2645

Same as No. 2646—except without Glass Filler.

No. 2647

Same as No. 2646—except with Glass Filler only.

No. 2626

ADAPTABLE to a wide range of uses, this recessed wall drinking fountain is built of heavy vitreous china. Brass strainer; self-closing lever handle stop; loose key regulator for ⅜-inch iron pipe supply; 1½-inch New York regulation trap with clean-out and metal wall flange. Equipped with push button glass filling faucet through back. *2-stream mound building projector and Taylor automatic stream control.* All exposed fittings chromium plate. Receptor opening, 12½ by 20¾ inches.

No. 2625

Same as No. 2626—except without Glass Filling Faucet.

No. 2627

Same as No. 2626—except with Glass Filling Faucet only.

No. 2631

SEMI-RECESSED, this popular Halsey Taylor model is likewise made of heavy vitreous china. Brass strainer; self-closing lever handle stop; loose key regulator and union connection for ⅜-inch iron pipe supply; waste outlet 1½-inch iron pipe (trap not furnished but may be placed in wall if desired). Equipped with push button glass filling faucet through back. *2-stream projector and Taylor automatic stream control.* All exposed fittings chromium plate. Projection from wall, 7 inches.

No. 2630

Same as No. 2631—except without Glass Filling Faucet.

No. 2632

Same as No. 2631—except with Glass Filling Faucet only.

No. 2634

THIS semi-recessed wall fountain is well proportioned in every detail. Heavy vitreous china. Brass strainer; self-closing cross handle stop; positive shut-off loose key regulator and union connection for ⅜-inch iron pipe supply; New York regulation cast brass trap (to be installed in wall). Equipped with push button glass filling faucet through back. *2-stream mound building projector and Taylor automatic stream control.* All exposed fittings chromium plate. Projection from wall, 7 inches.

No. 2633

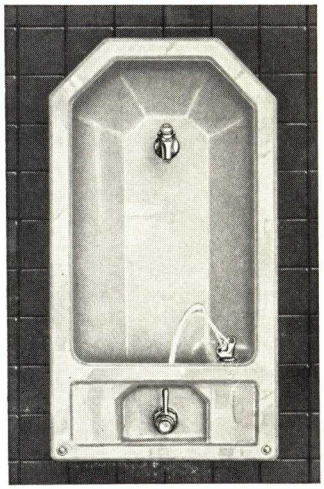
Same as No. 2634—except without Glass Filling Faucet.

No. 2635

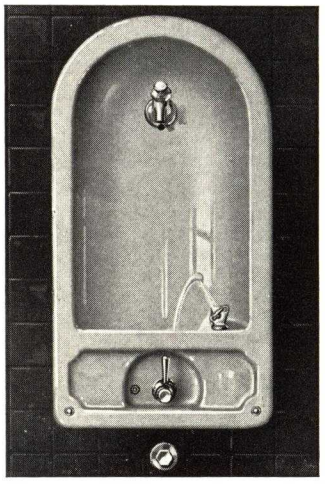
Same as No. 2634—except with Glass Filling Faucet only.

Dimensions . . .

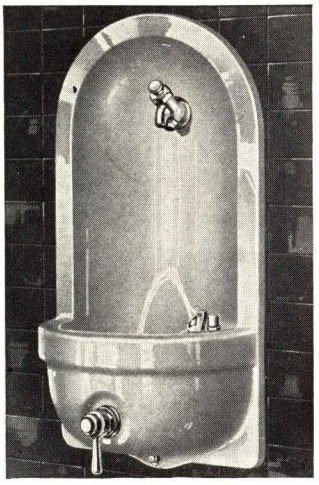
No.	Overall Width, in.	Height, in.	Recessed Depth, in.	Supply, I. P., in.	Waste, I. P., in.	Weight, lbs.
2646	16	29½	10	⅜	1½	72
2626	16	29½	10	⅜	1½	72
2631	14¼	26¼	5¼	⅜	1½	65
2634	14	26	4¾	⅜	1½	70



Halsey Taylor . . . No. 2646



Halsey Taylor . . . No. 2626

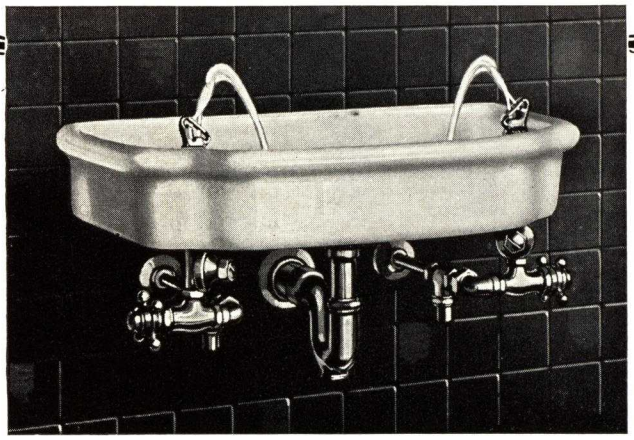


Halsey Taylor . . . No. 2631

Halsey Taylor . . . No. 2634

Vitreous China

BATTERY WALL FOUNTAINS



Halsey Taylor . . . No. 2612

No. 2612

DESIGNED with ample proportions but without back, this Halsey Taylor Battery Fountain is sturdily built of heavy vitreous china. Brass strainer self-closing stops with cross handles; loose key volume regulator; 1¼-inch brass trap. Two painted cast-iron wall brackets. *Two 2-stream mound building projectors and Taylor automatic stream control.* All exposed fittings are chromium plated.

No. 2610

THIS popular Halsey Taylor Battery Fountain has integral back and concealed hangers. Heavy vitreous china throughout. Brass strainer; self-closing stops with cross handles; 1¼-inch brass trap. *Two 2-stream mound building projectors and Taylor automatic stream control.* All exposed fittings are chromium plated.

No. 2611

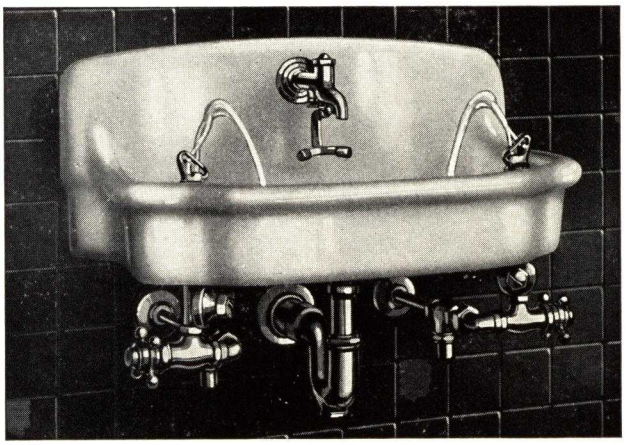
THIS Halsey Taylor combination Battery Drinking Fountain and Glass Filler is built with integral back and concealed hangers. Heavy vitreous china throughout. Brass strainer; self-closing stops with cross-handles; loose key volume regulators; 1¼-inch brass trap. Self-opening and self-closing glass filler faucet. *Two 2-stream mound building projectors and Taylor automatic stream control.* All exposed fittings are chromium plated.

This battery wall fountain can be furnished with any combination of heads, fillers or faucets.

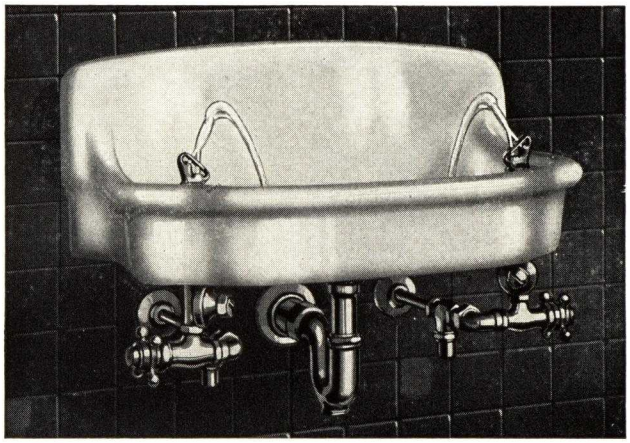
Dimensions . . .

No.	Depth of Receptor, in.	Overall Width, in.	Overall Height of Back, in.	Wall to Drinking Stream, in.	Projection from Wall, in.	Weight, lbs.
2612	3½	24	....	10½	13	60
2610	3½	24	10½	8½	13	75
2611	3½	24	10½	8½	13	75

Supply, ⅜-inch I.P. Waste, 1¼-inch.



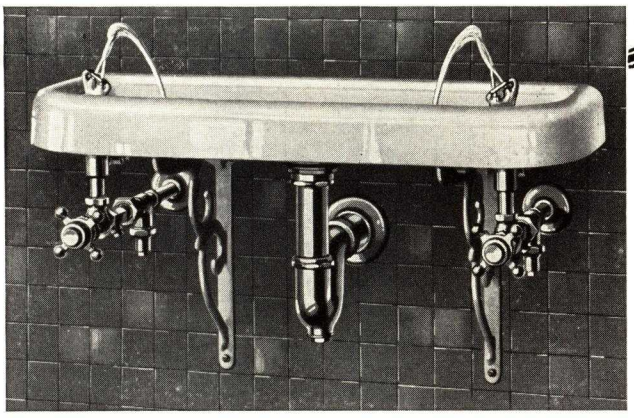
Halsey Taylor . . . No. 2611



Halsey Taylor . . . No. 2610

Vitreous Enamel

BATTERY WALL FOUNTAINS



Halsey Taylor . . . No. 2702

No. 2702

BUILT without back, this Halsey Taylor Battery Fountain has a trough and apron of cast iron, vitreous enameled. Brass supply fittings; self-closing supply valves; loose key compression stop; 1½-inch brass P trap with clean-out. Supporting brackets are painted iron. *Two 2-stream mound building projectors and Taylor automatic stream control.* All exposed fittings are chromium plated.

No. 3003

DESIGNED with integral back, this Halsey Taylor Battery Fountain has improved mound building projectors. The entire trough with apron is cast iron, vitreous enameled. Brass supply fittings; self-closing supply valves and loose key compression stop; 1½-inch brass P trap with clean-out. Painted iron supporting brackets. *No. 1728 improved mound building projectors with Taylor automatic stream control.* All exposed fittings are chromium plated. Overall height of back, 7 inches.

No. 2703

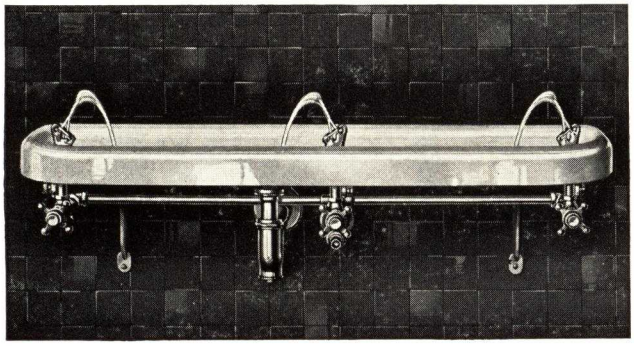
THIS popular Halsey Taylor Battery Fountain is designed without back and with supply valves under trough. Entire trough and apron are cast iron, vitreous enameled. Brass supply fittings; self-closing supply valves and loose key compression stop; 1½-inch brass P trap with clean-out. Supporting brackets are painted iron. *Three 2-stream mound building projectors and Taylor automatic stream control.* All exposed fittings are chromium plated.

No. 2704

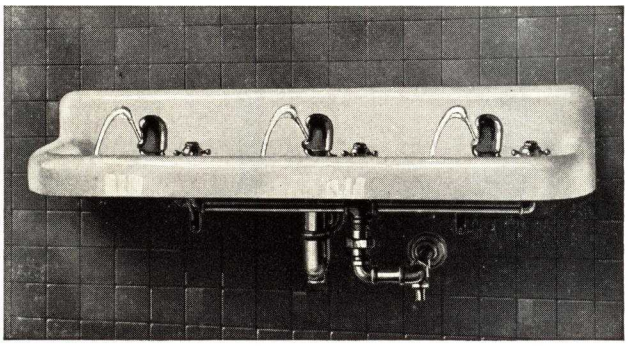
Same as No. 2702 or No. 2703 — except has four projectors.

Dimensions . . .

No.	Overall Width, in.	Distance between Heads, in.	Projection from Wall, in.	Supply, in., I.P.	Waste, in.	Weight, lbs.
2702	26	19	13	⅜	1½	72
2703	44	17	13	¾	1½	117
2704	55	15	13	¾	1½	135
3003	44½	13	13½	¾	1½	160



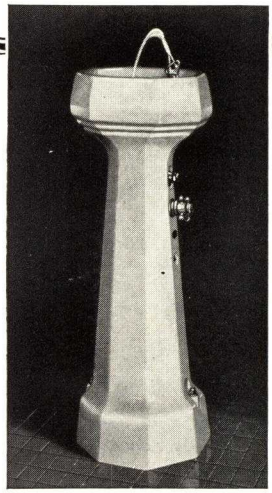
Halsey Taylor . . . No. 2703



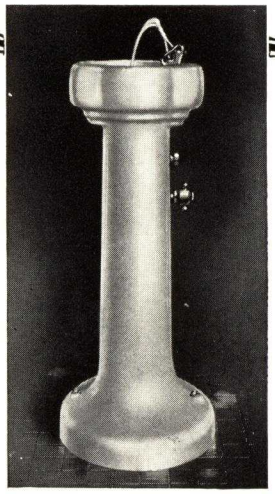
Halsey Taylor . . . No. 3003

Vitreous China

PEDESTAL DRINKING FOUNTAINS



Halsey Taylor . . . No. 2615



Halsey Taylor . . . No. 2616

No. 2615

OCTAGONAL pedestal fountain of heavy vitreous china. 10 by 13-inch receptor. Brass strainer; cast brass supply and waste connection; self-closing stop and loose key volume regulator. Floor screws with cap nuts. *No. 1728 improved mound building projector and Taylor automatic stream control.* All exposed fittings chromium plate. Depth of receptor, 3 inches.

No. 2616

HEAVY vitreous china pedestal fountain with round base. 10x13-inch receptor. Brass strainer; cast brass supply and waste connection; self-closing stop and loose key volume regulator at side of pedestal. Floor screws with cap nuts. *No. 1728 improved mound building projector and Taylor automatic stream control.* All exposed fittings chromium plate. Depth of receptor, 3½ inches.

No. 547

PEDESTAL Fountain with heavy vitreous china receptor and No. 515 fountain head. Self-closing stop; loose key volume regulator; 4-stream angle jet projector. 2⅜-inch outside diameter steel tubing standard with cast iron closed base. Galvanized supply and waste pipes concealed within standard. All exposed fittings chromium plate. Finished in gray.

No 548

Same as No. 547 — but with cast iron open base for connections above floor line.

No. 2617

STURDILY built fountain with heavy vitreous china receptor. Brass strainer; 2⅜-inch outside diameter steel tubing standard and cast iron closed base; self-closing stop; loose key volume regulator. *2-stream mound building projector and Taylor automatic stream control.*

No. 2520-600

EXTRA HEAVY Halsey Taylor Pedestal Fountain with heavy vitreous china receptor. 4-inch outside diameter steel tubing standard and heavy cast iron tripod base and cover. Brass strainer; enclosed galvanized supply and waste pipes; self-closing stop; loose key regulator concealed in base. *No. 1728 improved mound building projector and Taylor automatic stream control.* All exposed fittings chromium plate. Finished in gray.

By raising base cover, connections can be made without disturbing floor or concrete. After connections are made pedestal is bolted to foundation, stream adjusted, and base cover lowered to proper position, concealing regulator. Height of base cover, 10½ in. All exposed fittings chromium plate. Finished in gray.

No. 2618

Same as 2617 — but with cast iron open base for connections above floor line.

Dimensions . . .

No.	Receptor, in.	Heights, in.	Diam. at Floor, in.	Supply, in.	Waste, in.	Weights, lbs.
2615	10x13	30 36	11½	⅜	1	85 90
2616	10x13	30	16	⅜	1	85
547	9½	36 39	9½	⅜	½	35 37
2617	7½x10½	36 39	9½	⅜	1	36 39
2520-600	7½x10½	36 39 42	16½	⅜	1	82 84 86

Halsey Taylor
No. 547

Halsey Taylor
No. 548

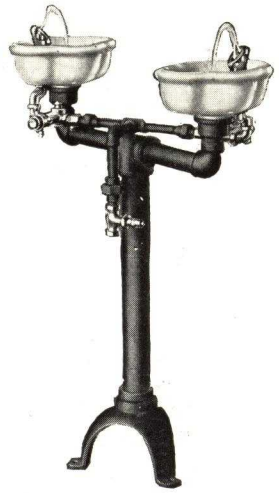
Halsey Taylor
No. 2617

Halsey Taylor
No. 2618

Halsey Taylor
No. 2520-600

Vitreous China and Enamel

PEDESTAL DRINKING FOUNTAINS



Halsey Taylor . . . 2618-2

No. 2618-2

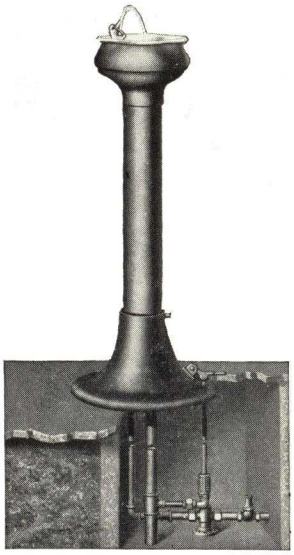
PEDESTAL Fountain with two heavy vitreous china receptors. Brass strainers. 2⅜-inch outside diameter steel tubing standard and cast iron open base; self-closing stops; loose key volume regulators and loose key compression stop. *2-stream mound building projector and Taylor automatic stream control.* All exposed fittings chromium plate. Finished in gray. Depth of receptor, 3 inches. Overall width, 28½ inches.

No. 2520-68 Anti-Freeze

THIS Halsey Taylor Pedestal Fountain has special anti-freeze feature. Receptor is made from cast iron, vitreous enameled, set in cast iron protecting shield. Heavy cast iron top and base; 4-inch outside diameter steel tubing standard; enclosed galvanized supply and waste pipes; self-closing stop; loose key volume regulator concealed in base. *2-stream mound building projector and Taylor automatic stream control.* Foot operated anti-freeze self-closing stop for various lengths of bury. All exposed fittings chromium plate. Height of base cover, 10½ inches. Finished in gray.

No. 2567

HEAVY cast iron vitreous enameled bowl. 2⅜-inch outside diameter steel tubing standard and cast iron closed base; self-closing valve; loose key volume regulator. *2-stream mound building projector.* All exposed fittings chromium plate. Finished in gray.



Halsey Taylor . . . 2520-68 Anti-freeze

No. 2568

Same as No. 2567 — except has cast iron open base for connections above the floor line.

No. 2520-68

RECEPTOR on this fountain is made from cast iron, vitreous enameled, and set in cast iron protecting shield. Heavy cast iron top and base; 4-inch outside diameter steel tubing standard; enclosed galvanized supply and waste pipes; self-closing stop; loose key volume regulator concealed in base. *2-stream mound building projector and Taylor automatic stream control.* All exposed fittings chromium plate. Finished in gray.

No. 520

Same as for No. 2520-68 — except furnished with vitreous china bowl, 4-stream projector and without automatic control.

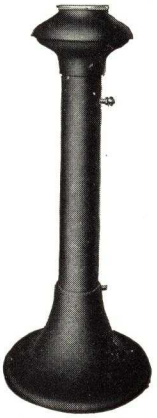
Dimensions . . .

No.	Receptor, in.	Overall Height, in.	Base, in.	Waste, in.	Supply, in.	Weight, lbs.
2618-2	7½x10½	36	12½	1½	½	80
2520-68 anti-freeze	7½x10	36 39 42	16½	1	⅜	100 (app.)
2567	6½x9½	36 39	9½	1 I.P.	⅜ I.P.	32 35
2520-68	7½x10	36 39 42	16½	1	⅜ I.P.	85
520	7½x10	36 39 42	16½	1	⅜ I.P.	82 84 89

Halsey Taylor No. 2567

Halsey Taylor No. 2568

Halsey Taylor No. 2520-68



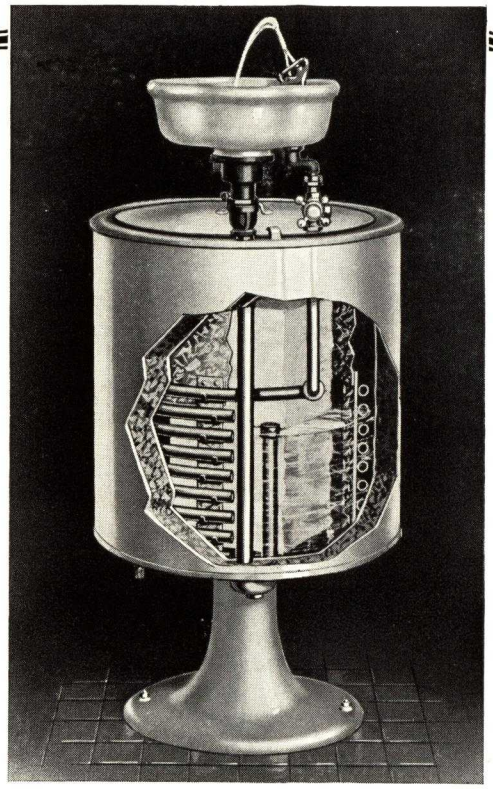
Halsey Taylor No. 520

Combination
COOLERS AND DRINKING FOUNTAINS

No. 2800

A POPULAR Halsey Taylor Combination Cooler and Drinking Fountain. Heavy vitreous china receptors. Brass strainer; brass supply and cast iron trap mounted on cooler. Cover, top and base made of cast iron and pressed steel. Body of tank and coil guard made from galvanized sheet iron. Insulation is re-granulated cork in side walls and pressed cork board in bottom and cover of cooler. Cooling coil made from ½-inch No. 20 gauge brass tubing, tinned inside and outside. Supply and waste pipes concealed between walls of cooler; supply pipe furnished with self-closing stop and volume regulator.

2-stream mound building projector and Taylor automatic stream control. All exposed fittings chromium plate. Finished in gray. Receptor, 7½ by 10½ inches. Diameter of base, 14 in. Ice capacity approximately 1 pound per capita per day.



Halsey Taylor . . . No. 2800

No. 2802

Same as No. 2800—except with two heads.

No. 2822

COMBINATION Cooler and Drinking Fountain, similar to No. 2802. Ice capacity, 120 pounds; cooling coil of double length. *2-stream mound building projector and Taylor automatic stream control.* All exposed fittings chromium plate. Finished in gray. Dimensions of ice chamber: 20 inches outside diameter by 30 inches high. Height to top of fountain receptor, 42 inches.

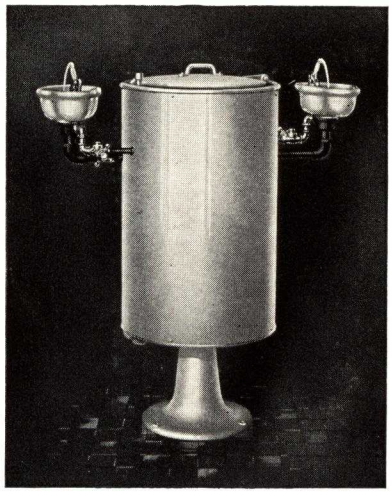
No. 2820

Same as 2822—except with one head.

No. 2580

CAFETERIA Cooler and Drinking Fountain; 15½-inch diameter combination cast iron cover and catch basin. Perforated chrome plated brass drain plate; brass supply and cast iron trap mounted on cooler. Cover, top and base of cast iron and pressed steel. Body of tank, coil, coil guard and insulation same as No. 2800. Supply and waste pipes concealed between walls of cooler. Catch basin is removed to replenish ice in cooler.

Equipped with vitreous china receptor, *2-stream mound building projector and Taylor automatic stream control* and one self-opening, self-closing glass filler. All exposed fittings chromium plate. Finished in gray or white.

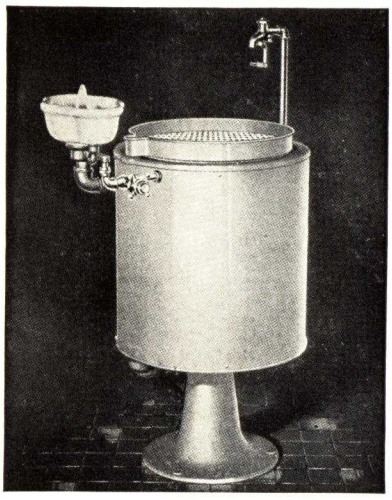


Halsey Taylor . . . No. 2822

Dimensions . . .

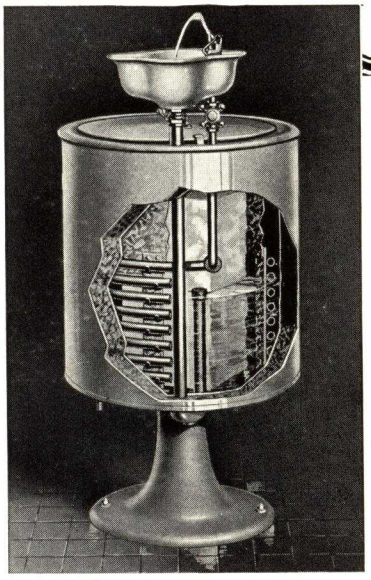
No.	Ice Chamber, in.		Height to Top of Ice Chamber, in.	Height to Top of Receptor, in.	Ice Capacity, lbs.	Weight, lbs.
	Outside Diameter	Height				
2800	20	20	32	40	80	125
2802	20	20	32	40	80	145
2820	20	20	32	40	120	185
2822	20	30	42	42	120	195
2580	20	20	32	40	80	155

Supply, ⅜-inch, I. P. Waste, 1-inch I. P.



Halsey Taylor . . . No. 2580

Combination
COOLERS AND DRINKING FOUNTAINS

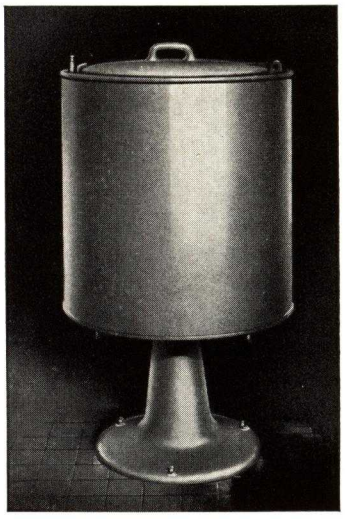


Halsey Taylor . . . No. 2570

No. 2570

COMBINATION Cooler and Drinking Fountain. Cast iron vitreous enameled receptor. Brass strainer; brass supply and cast iron trap mounted on cooler. Cover, top and base made of cast iron and pressed steel. Body of tank and coil guard made from galvanized sheet iron. Insulation is regranulated cork in side walls and pressed cork board in bottom and cover of cooler. Cooling coil made from ½-inch No. 20 gauge brass tubing, tinned inside and outside. Supply and waste pipes concealed between walls of cooler; supply pipe furnished with self-closing stop and volume regulator. *2-stream mound building projector.*

All exposed fittings chromium plate. Finished in gray. Ice capacity, 80 pounds.

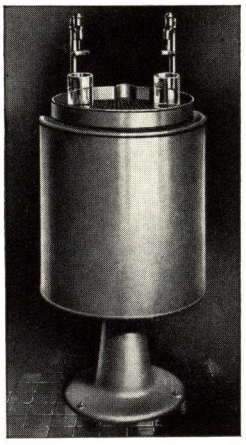


Halsey Taylor . . . No. 2571

No. 2571

PLAIN Cooler designed for use in connection with drinking fountains already installed or where it is desired to conceal the cooler; also for installation in basement to supply fountains on floors above. Brass supply and waste connections. Cover, top and base made of cast iron and pressed steel. Body of tank and coil guard made of galvanized sheet iron. Insulation is regranulated cork in side walls and pressed cork board in bottom and cover of cooler. Cooling coil made from ½-inch No. 20 gauge brass tubing, tinned inside and outside. Supply and waste pipes concealed between walls of cooler.

Finished in gray. Ice capacity, 80 pounds.



Halsey Taylor . . . No. 2577

No. 2572

SAME as 2571 — except ice capacity is 120 pounds.

No. 2577

THIS Cafeteria Cooler is equipped with two self-opening, self-closing glass fillers. Combination cast iron cover and catch basin, 15½ inches in diameter, with perforated chrome plated brass drain plates. Brass supply and cast iron trap mounted on cooler. Cover, top and base made of cast iron and pressed steel. Body of tank and coil guard made from galvanized sheet iron. Insulation is regranulated cork in side walls and pressed cork board in bottom and cover of cooler. Cooling coil made from ½-inch No. 20 gauge brass tubing, tinned inside and outside; supply and waste pipes concealed between walls of cooler.

Catch-basin is removable to replenish ice in cooler. All exposed fittings chromium plate. Finished in gray or white. Ice capacity, 80 pounds.

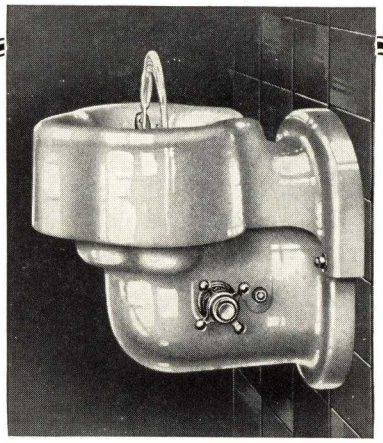
Dimensions . . .

No.	Ice Chamber, in.		Height to Top of Ice Chamber, in.	Overall Height, in.	Weight, lbs.	Waste, in., I. P.
	Outside Diameter	Height				
2570	20	20	32	40	122	1
2571	20	20	32	35	112	½
2572	20	30	42	42	170	½
2577	20	20	32	42	140	1

Supply, ⅜-inch, I. P.

Miscellaneous

WALL DRINKING FOUNTAINS



Halsey Taylor . . . No. 2607

No. 2607

HEAVY cast iron vitreous enamel all-over wall drinking fountain with integral trap housing. Concealed wall hanger; brass wall bolts; brass strainer; self-closing stop with cross handle; loose key regulator and union connection supply; rough brass trap outlet. *2-stream mound building projector and Taylor automatic stream control.* All exposed fittings chromium plate. Overall height of back, 10½ inches.

No. 2600

WALL Fountain with heavy vitreous china receptor. Brass strainer; cast iron baked gray enameled bracket to wall; self-closing stop; ⅜-inch brass supply; 1¼-inch brass trap and waste pipe. *2-stream mound building projector and Taylor automatic stream control.* All exposed fittings chromium plate.

No. 2623

HEAVY vitreous china wall drinking fountain with integral trap housing. Concealed wall hanger; brass strainer; self-closing stop; loose key regulator and union connection for supply; 1½-inch New York regulation trap with clean-out plug. Equipped with push button glass filling faucet and *2-stream mound building projector and Taylor automatic stream control.* All exposed fittings chromium plate. Overall height, 18 inches. Weight, 105 pounds.

No. 2622

Same as No. 2623—except without back. Shipping weight, 50 lb.

No. 2624

Same as No. 2623—except with 24-inch back. Shipping weight, 115 lb.

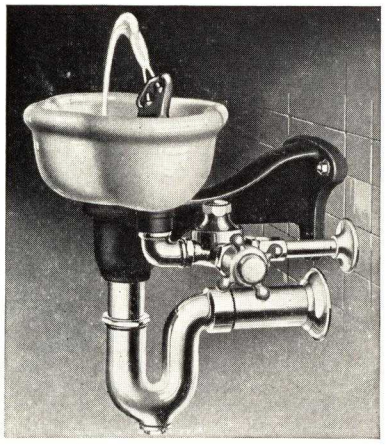
No. 2614

HEAVY vitreous china wall drinking fountain with integral back and concealed hanger. Brass strainer; self-closing stops with cross handle; ⅜-inch iron pipe supply; 1¼-inch brass trap. Equipped with push-back glass filler faucets. *2-stream mound building projector and Taylor automatic stream control.* All exposed fittings chromium plate. Overall length, 18 inches.

Dimensions . . .

No.	Receptor, in.	Depth of Receptor, in.	Overall Width, in.	Projection from Wall, in.	Wall to Stream in.	Waste, in., I. P.	Weight, lbs.
2607	10¾x14	3¼	14	14	8½	1¼	60
2600	7½x10½	3	10½	11¼	8	1	22
2623	12x13	3½	13¾	13	10½	1½	60
2614	13x18	3½	18	13	8½	1¼	65

Supply, ⅜-inch I. P.

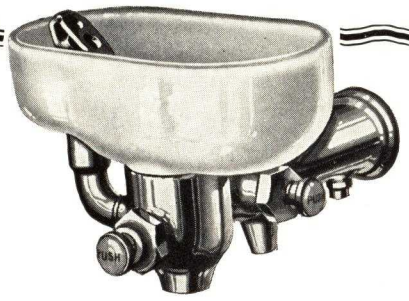


Halsey Taylor . . . No. 2600

Halsey Taylor . . . No. 2623

Halsey Taylor . . . No. 2614

Non-Automatic
FOUNTAINS



Halsey Taylor . . . No. 2002

No. 2002

FOUNTAIN with push button valve, 2-stream angle jet projector and push button glass filler valve. Cast iron enameled bowl provided with slot to prevent waste water from rising over projector in case of drain stoppage. All exposed fittings *chromium plate.* Overall width, 7 inches. Overall height, 5 inches.

No. 2566

CANTONMENT Type Wall Fountain. Cast iron vitreous enameled all over. Self-closing stop; loose key volume regulator; brass strainer; 1¼-inch brass trap. *2-stream mound building projector.* All exposed fittings *chromium plate.* Projection to drinking mound, 8 inches.

No. 2575

FOUNTAIN Head with cast iron vitreous enamel receptor. Used to replace present unsanitary heads on coolers and pedestal fountains. Self-closing stop and volume regulator. *2-stream mound building projector.* All exposed fittings *chromium plate.*

No. 540

WALL Fountain with heavy 6-inch vitreous china bowl mounted on cast iron bracket and bowl support. Self-closing stop; loose key volume regulator. *4-stream angle jet projector.* All exposed fittings *chromium plate.* Finished in gray.

No. 2586

FOUNTAIN Head with vitreous china receptor. Used to replace present unsanitary heads on coolers and pedestal fountains. Brass strainer; self-closing stop with regulator and union connection. *2-stream mound building projector and Taylor automatic stream control.* All exposed fittings *chromium plate.*

No. 542

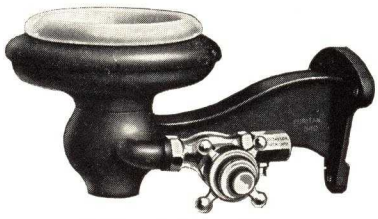
WALL Fountain with heavy 9½-inch vitreous china bowl mounted on cast iron bracket to wall. Brass strainer; 3¾-inch guard ring; self-closing stop; loose key volume regulator. *4-stream angle jet projector.* All exposed fittings *chromium plate.* Finished in gray.

Dimensions . . .

No.	Receptor, in.	Projection from Wall, in.	Supply, I. P., in.	Waste, in.	Weight, lbs.
2002	. . . . .	8½	⅜	⅜	12
2566	6½ x 9½	11½	⅜	1¼	15
2575	6½ x 9½	. . . .	⅜	1¼ or 1½ I.P.	13
540	6 dia.	12	⅜	1 I.P.	15
2586	7½ x 10½	. . . .	⅜	1¼ or 1½	14
542	9½	12	⅜	1 I.P.	18

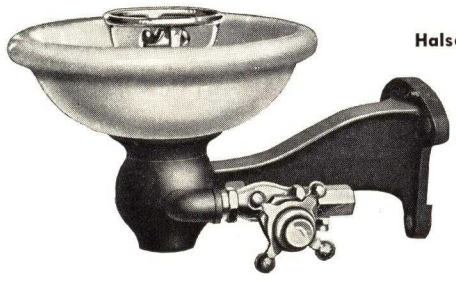
Halsey Taylor . . . No. 2566

Halsey Taylor . . . No. 2575



Halsey Taylor . . . No. 540

Halsey Taylor . . . No. 2586



Halsey Taylor . . . No. 542

FOUNTAIN HEADS

No. 501

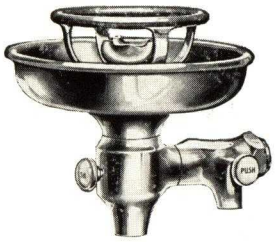
With 4-inch nickel plated spun brass or vitreous china bowl; self-closing push button valve; volume regulator; *4-stream angle jet projector;* ½-inch supply; ⅜-inch outlet, iron pipe threads. Weight, 3 pounds.

No. 502

Same as No. 501 — but has self-closing push button valve on side for filling glass; ½-inch supply; ⅜-inch outlet, iron pipe threads. Weight, 3 pounds.

No. 504

With 4-inch nickel plated spun brass or vitreous china bowl; self-closing stop; volume regulator; *4-stream angle jet projector;* ⅜-inch supply; ⅜-inch outlet, iron pipe threads. Weight, 4 pounds.



No. 505

With 6-inch nickel plated spun brass bowl; guard ring; self-closing push button valve; volume regulator; *4-stream angle jet projector;* self-closing push button valve on side for filling glass; ½-inch supply; ⅜-inch outlet, iron pipe threads. Weight, 4 pounds.

No. 506

Nickel plated brass; self-closing lever handle stop with lavatory tailpiece; volume regulator; 4-inch vitreous china bowl; *4-stream angle jet projector;* ¼-inch iron pipe supply; ⅜-inch waste. Weight, 6 pounds.

No. 507

Nickel plated brass; self-closing lever handle stop with lavatory tailpiece; volume regulator; *2-stream mound building projector with guard* and ¼-inch iron pipe supply. Weight, 5 pounds.

No. 1742

Chrome plated brass; self-closing lever handle stop; volume regulator; lavatory tailpiece; *2-stream mound building projector* and hood guard; ½-inch iron pipe supply. Weight, 4 pounds.

No. 1743

Chrome plated brass; automatic control self-closing lever handle stop; lavatory tailpiece; *2-stream mound building projector and Taylor automatic stream control;* hood guard; ½-inch iron pipe supply. Weight, 4 pounds.

No. 1744

Chrome plated brass; cross handle self-closing stop; volume regulator; *2-stream mound building projector;* supply ½-inch male I. P. thread. Weight, 3 pounds.

No. 508

Nickel plated brass; self-closing stop; volume regulator; 3¾-inch guard ring; *4-stream angle jet projector;* ⅜-inch iron pipe supply. Weight, 4 pounds.

No. 509

Nickel plated brass; self-closing stop; volume regulator; 3¾-inch guard ring; *4-stream angle jet projector;* supply ⅜-inch iron pipe. Weight, 3 pounds.

No. 514

With nickel plated brass base and 4-inch vitreous china bowl; loose key volume regulator; furnished with *4-stream angle jet projector;* height 4¼ inches; ⅜-inch iron pipe supply. Weight, 3 pounds.

No. 515

Nickel plated brass; with 3¾-inch guard ring; loose key volume regulator; *4-stream angle jet projectors;* height overall 3⅛ inches; furnished with either ⅜-inch iron pipe male or female thread. Weight, 2 pounds.

SPECIAL TYPES

No. 1747

No. 1747

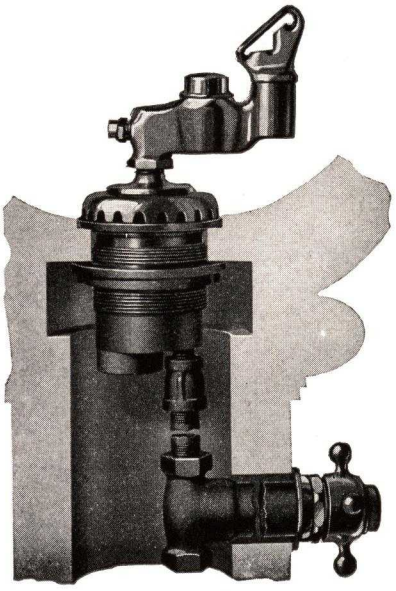
Halsey Taylor Combination Bubbler and Ice Water Faucet with 6-inch metal bowl; *4-stream angle jet projector;* 6-inch drain tailpiece; volume regulator; supply ⅜-inch with union connection. All chrome plate. Weight, 10 pounds.

No. 1747-A

Same as No. 1747 except fitted with *2-stream mound building projector and Taylor automatic stream control.* Weight 10 pounds.

No. C-439

Halsey Taylor Fittings for marble, stone, terra cotta, etc., wall or pedestal fountains. Rough brass combination supply and waste fitting; brass strainer; tailpiece; C. H. self-closing stop; *2-stream mound building projector and Taylor automatic stream control.* All exposed parts chromium plate. Write for detailed blueprints giving sizes and dimensions for cutting marble. Weight, 12 pounds.



No. C-439

Automatic CONTROL HEADS

Designed to replace present unsanitary bubblers or drinking fountains already installed

No. 564

Made from C. P. Brass with vitreous china guard; loose key volume regulator; ⅜-inch female thread: length over all 4½ inches from center of supply. Furnished with *2-stream mound building projector and Taylor automatic stream control.*

No. 593

Made from C. P. Brass with loose key volume regulator; furnished with *2-stream mound building projector and Taylor automatic stream control;* ⅜-inch female thread; length over all 3½ inches from center of supply.

No. 592

Made from C. P. Brass with loose key volume regulator; furnished with *2-stream mound building projector and Taylor automatic stream control;* ⅜-inch female thread; length over all 3½ inches from center of supply.

No. 1728

Made from C. P. Brass with loose key volume regulator; furnished with *new improved mound building projector and Taylor automatic control;* ⅜-inch thread; height over all 4 inches.

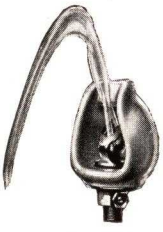
PROJECTORS

No. 1646

No. 186

No. 1745

No. 1746



No. 562

No. 1000

Above are shown various types of projectors and guards used on Halsey Taylor equipment. The No. 186 projector is regularly used and is interchangeable with other types shown.

Unless otherwise specified, No. 186 projector will be furnished.

Projectors shown above are not sold for use on new ware manufactured by others but for replacement purposes only.

27
89

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SECTION 27

CONTINUED ⟶

TEMPRITE PRODUCTS CORPORATION

Originators of Instantaneous Liquid Cooling Devices

Manufacturers of Water Cooling Units and Fixtures for Multiple—Circulating—Dead End and Self-Contained Systems

DETROIT, MICHIGAN

Temprite Products Sold and Installed Through Regular Refrigeration Distributors

---

TEMPRITE WATER COOLER

Water coils of the Temprite Water Cooler are submerged in the liquid refrigerant. Thus the heat of the water being cooled passes directly to the main body of the refrigerant. Heat transfer is direct and instantaneous and the unit's efficiency much higher than it could be otherwise. This design and construction is an exclusive Temprite advantage.

High Efficiency — Maximum Economy

The high efficiency of Temprite's direct heat transfer accounts for the unusually high capacity in a small, compact unit. This also provides a very high overload capacity and ability to recover quickly after being subjected to excessive demands.

Operating at high suction pressure results in low current consumption and gives Temprite characteristic operating economy.

Close Individual Control

An efficient quick acting control valve, in combination with the direct heat flow principle, removes the possibility of objectionable fluctuations in the exit temperature of the water being cooled. This temperature cannot drop below that for which the unit is set. The temperature is adjustable to meet the requirements of the service in which the cooler is placed.

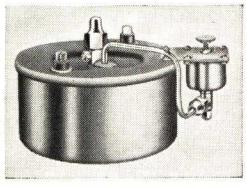
The compact design of the Temprite eliminates long connecting tube between the cooling coil itself and the bubbler. Consequently, there is no heat absorption between coil and bubbler. Nor is it necessary to waste warm water at the bubbler. The first drink is always cooled to the proper temperature.

Full Range of Capacities

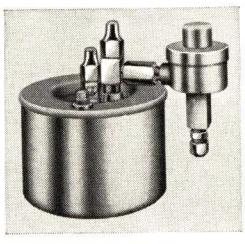
The Temprite Cooling Unit is made in five standard capacities to meet any type of water cooling requirement. With tap water at 80° F., and desired exit temperature at 50° F., the capacities of these units range from 10 to 160 gallons per hour. In this range, you will find a Temprite with a capacity to meet your needs, and assure an ample supply of drinking water at the right temperature.

Applications

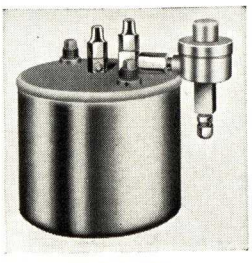
Temprite Coolers are preferred for commercial and industrial applications. Thousands of these units are in successful operation in office buildings, hotels, schools, theaters, restaurants and industrial plants. Industrially, the Temprite is used not only to cool drinking water but also for process cooling.



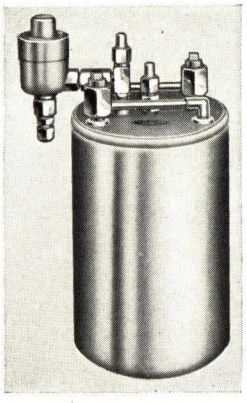
Model 22-W



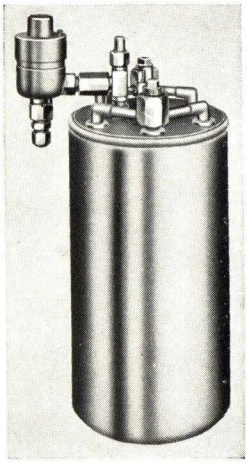
Model 35-W



Model 40-W



Model 65-W

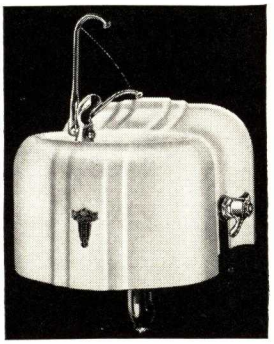


Model 90-W

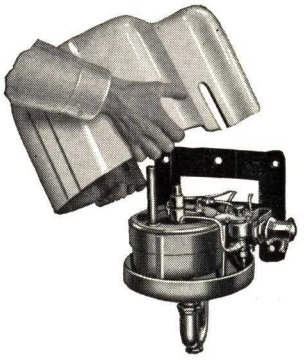
TEMPRITE FIXTURES AND INSTALLATIONS

Pedestal Fountain
Models 322-F and 322-S

Wall Fountain
Model 122



As optional equipment, Temprite Wall Fountain Models can be fitted with bubbler and glass filler combination fixture instead of the bubbler only. As will be seen from illustration above this fixture incorporates two separate duties: when the gooseneck is raised it operates as a glass filler—when the gooseneck is lowered it functions as a bubbler



The entire bowl may be removed without disturbing water, drain or refrigerant lines, giving free access to cooling unit and all valves. Bowl on pedestal model may be removed in the same manner

Fixtures

Temprite Fixture Model Coolers—both wall type and pedestal—are designed for either single or multiple applications. The cooling units are installed directly in the fixtures. The drinking jet pipe is in metallic contact with the cooler thereby assuring a cold first drink at all times.

Water temperature in each fountain is governed by its own control valve and irrespective of surrounding heat conditions, will furnish instantaneously cooled, refreshing water at all times at the same uniform, pre-determined temperature. It does not matter if one or 100 or more fountains are being used simultaneously, each will deliver water at the temperature for which its individual control is set.

Wall and Pedestal Fountains

Strikingly beautiful fixtures of gleaming white porcelain on iron—Temprite Wall and Pedestal Fountains are a credit to any establishment. As may be seen in the upper right-hand illustration, the entire bowl of either model may be removed without disturbing water or refrigerant lines, giving free access to cooling unit and to all valves.

Wall Model 122

Complete with cooler, angle stream, drinking jet and mouth guard, designed to comply with all sanitary codes, and a stream height-control valve which automatically regulates the height of the drinking stream. All exposed hardware in rich durable chrome.

Pedestal Fountain Model 322

Similar in appointments to wall model. Refrigerant lines and water inlet can be brought either through side of pedestal or through the floor.

Temprite Self-contained Industrial Coolers

Models 350-I and 350-IJC

These Temprite Coolers have a wide application in factories, mills and industrial plants, where positive temperature control and high capacities are desired and where one or more self-contained coolers meet requirements to best advantage.

Entire mechanism is contained in the cabinet, which is of furniture steel, rustproofed by bonderizing, finished in olive green crystal lacquer. Cast iron top is finished in white porcelain and concaves toward the drain receptor in center, thus giving automatic gravity drainage at all times. Entire front and rear panels are removable, which permits inspection and field service of condensing unit without removing top, or disturbing plumbing fixtures. All hardware is heavily chrome plated.

Model 350-I is equipped at both ends with angle stream drinking jets, mouth guards and stream height control valves. Equipped with cooling unit and equalizer tank.

Model 350-IJC is designed for use in the South. A vertical dividing partition on top is finished in white porcelain on one side and black porcelain on the other. Top follows same color treatment. Each section of top concaves to its own individual drain.

Model 350-I
Double bubbler high capacity self-contained industrial cooler

Model 350-I.J.C.
Same as 350-I but equipped with black and white top and dividing partition. Designed for use in the South

Complete Line of High Capacity Industrial Coolers

Temprite manufactures a complete line of high capacity industrial coolers comprising twelve models in all, specifications of which are set forth in Catalog T-137. The cabinets illustrated on this page are typical examples of this line.

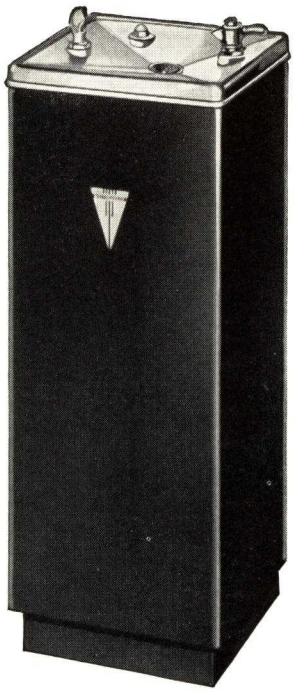
Write for this complete catalog of Temprite Products.

When ordering Temprite units, specify whether for Sulphur Dioxide, Methyl Chloride or Freon-12

WESTINGHOUSE ELECTRIC & MFG. CO.

MANSFIELD, OHIO

For Reference to Other Products, see File Index



Westinghouse Streamline Heavy-duty Water Cooler

WATER COOLERS

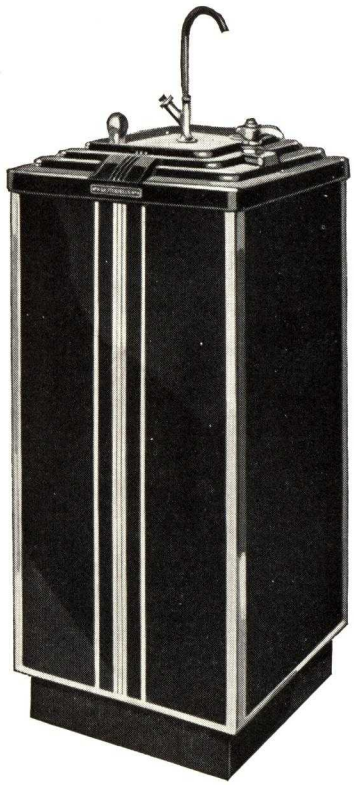
Westinghouse offers a broad line of *hermetically sealed* water coolers, all backed by a *5-year warranty* against service expense on the sealed-in mechanism.

All are permanently oiled. All are further protected by the famous "Built-in Watchman." Power is truly sealed in; trouble locked out.

Streamline Coolers—For heavy duty requirements, have *water-cooled compressor, condenser and motor,* improving efficiency and preventing clogged condensers. New *Dual-Action Evaporator* increases capacities with no additional cost. Even the drains are extra large—cannot clog.

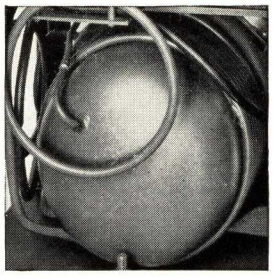
Airline Coolers—Air-cooled, for moderate service, are equally outstanding under normal operating conditions. Forced-draft condenser speeds up cooling action, cuts operating costs.

The aristocratic *Micarta* Cooler and the new *Thrift* models, all of which are *air-cooled,* complete the line. Secure further details from your local Westinghouse dealer. Have him make a *free survey* of your clients' requirements.



Pressure-type Water Cooler Westinghouse Micarta

8 OUTSTANDING EXCLUSIVE FEATURES



Hermetically-sealed Unit, Oiled for Life

Hermetically-sealed mechanism—immune to dust, lint, moisture.

No belts to break—no shaft seals to need repacking.

"Built-in Watchman"—protects motor against overheating.

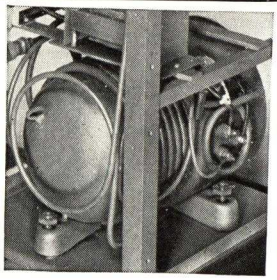
Permanent oil supply—reaches every moving part.

Completely water-cooled units—entirely trouble-free anywhere.

Special brushless motors—cannot burn out, ever.

Unobstructed non-clogging drains.

5 years complete protection against service expense on the hermetically-sealed mechanism.

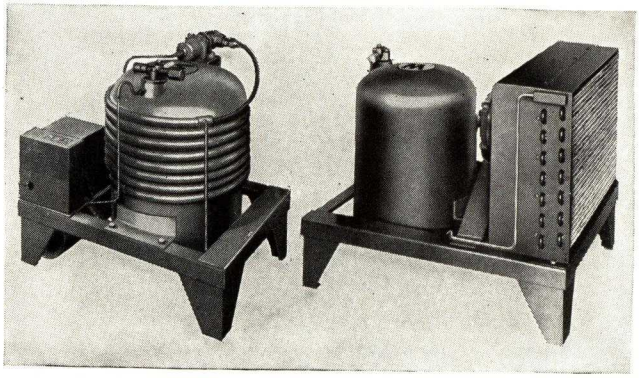


Choice of Forced-draft or Water-cooled Condenser

COMMERCIAL REFRIGERATION

Westinghouse builds *hermetically-sealed* condensing units for every refrigeration requirement; each backed by the *5-year Protection Plan* against service expense on the sealed-in mechanism. Twelve models to choose from, in sizes from ⅛ to 2½ hp., air-cooled or water-cooled.

For d-c. and odd cycle current, Westinghouse provides a complete line of *open-type* units air-cooled and water-cooled. Also a comprehensive line of refrigerating coils, to meet every need.



Air-cooled and Water-cooled Models, All Hermetically-sealed and Backed by the 5-Year Protection Plan

5-Year Protection Plan—Only Westinghouse offers *hermetically-sealed* units for commercial refrigeration, and the *5-year Protection Plan* on the sealed-in mechanism.

Fully enclosed in an armor of steel, permanently oiled and further protected by the "Built-in Watchman," these units give lifetime satisfaction, stand up longer, cost less to operate.

For full details, see your Westinghouse dealer or write Westinghouse, Mansfield, Ohio.

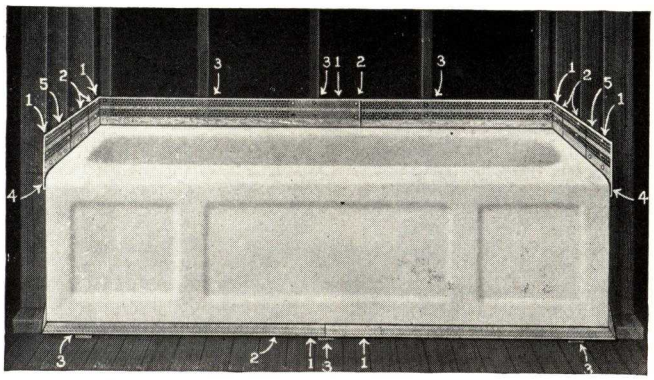
WILLIAM B. LUCKE

Manufacturer of Lucke Leakproof Hangers
WILMETTE, ILL.

THE LUCKE LEAKPROOF TUB HANGER

Uses

The Lucke Leakproof Tub Hanger has been designed to fulfill several requirements. It prevents leakage around tub rims by acting as a water seal between any wall and the edge of a built-in tub or shower receptor, and acts as a water seal between the apron of the tub and floor. It prevents bathtubs from settling and thus eliminates unsightly cracks; it saves labor cost for retiling or replastering. This hanger protects against damage to ceilings and walls of rooms below the bathroom.



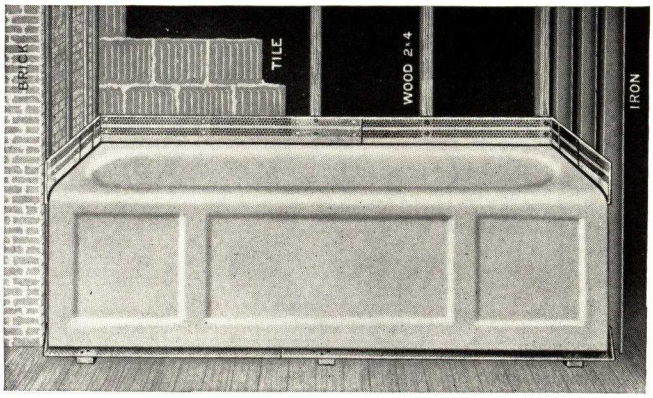
Patented in United States and Canada

This is how installation looks when ready for lath and plaster or other materials. Figures indicate essential features in construction and installation.

Fig. 1—Bolts in hanger where necessary.
Fig. 2—Filler to seal joints against leaks.
Fig. 3—Two nails, screws or bolts at every stud.
Fig. 4—Filler in groove between tub and hanger.
Fig. 5—Perforation as a base for wall materials.

Adaptability

The Lucke hanger is flexible in its physical properties as it can be adjusted to any length or width and can be made for any special installation. It is also adaptable to any type of wall finish. In the illustration below four types are shown with installation; at the left is brick, then tile or terra cotta blocks, wood and channel iron. Concrete walls, cinder and gypsum blocks are also adaptable for Lucke hangers.



This installation shows a few of the types of wall construction to which the Lucke Tub Hanger is adaptable. First is brick, then tile or terra cotta blocks, wood studdings and channel iron

Construction and Installation

The hanger is made from heavy gauge galvanized steel. It is fashioned like a trough or gutter, with a wide upper strip, part of which is perforated to serve as a base for plaster, cement or any other kind of wall material to key into. The gutter of the hanger is partly filled with Lucke Leakproof Filler (a special wax combination), which is easily applied and which retains its elasticity indefinitely. When the filler has been applied the hanger is pushed up tightly under tub rim and is fastened or hung to the partitions or walls. After the hanger is completely installed, the remaining space between tub and hanger is filled with Lucke Leakproof Filler up to and even with the tub rim. This renders edges of tub watertight.

The floor strip is turned up at right angles to act as a perfect seal at base of tub between apron of tub and the floor. This strip is set back about 1 in. from apron of the tub and about ⅞ in. below the apron to allow the cement to be pushed back securely against the hanger under apron of tub. The installation of the hanger makes the tub a unit with the building, causing the tub and building to settle as one unit. The installation is simple. Complete instructions are furnished with every hanger.

Specifications

All bathtubs (and shower receptors) shall be hung on Lucke Leakproof Tub Hangers as manufactured by WILLIAM B. LUCKE, Wilmette, Ill. Attachment to wall construction shall be by special nails (or bolts) furnished by the manufacturer; the tubs shall be installed in the Hangers in strict accordance with the directions of the manufacturer, using Lucke Leakproof Filler as a water seal.

Lucke Filler, all necessary nails, bolts and instructions are furnished with Lucke Tub Hangers.

Hanger Clamps

Clamps as shown in Fig. 1 are used on all corner tubs to prevent tilting or sagging of diagonal corner of tub. A complete installation of a corner tub always includes these clamps. Rigid tests have been made with these clamps on both the apron and tile-front type tubs and the tests have failed to budge the tubs from their position. A different type clamp is used for tile-front tubs (Fig. 4). The bottom bolt in this clamp is used to hold the tub tight against the wall. Clamps are used only on Corner tub installations. Felt pads are provided to protect enamel on tub.

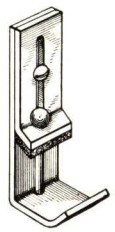


Fig. 3
Full View
Clamp

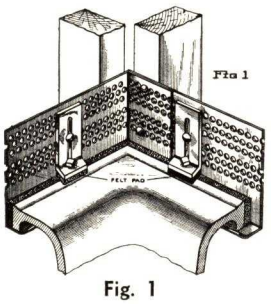


Fig. 1

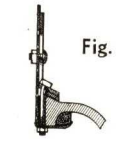


Fig. 2

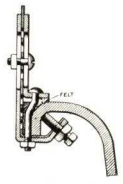


Fig. 4

HIGGIN PRODUCTS, INC.

Access Panels

NEWPORT, KENTUCKY

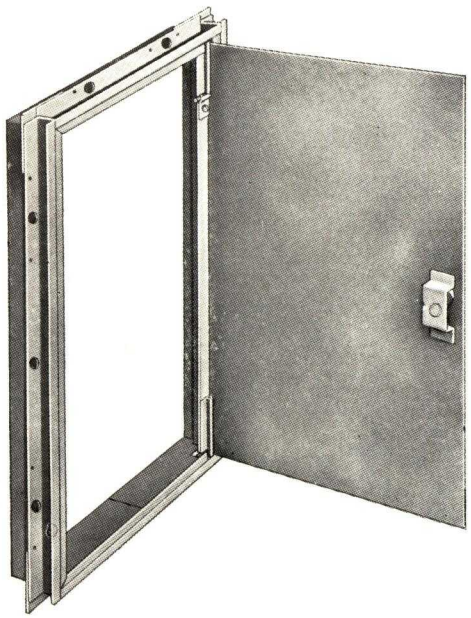
AGENCIES IN PRINCIPAL CITIES

For Metal Frame, Wood Frame and Rolling Screens, Venetian Blinds, Lightproof Shades and Weatherstripping, see our pages in File Index

Higgin Metal Access Panels

HIGGIN ALL METAL Access Panel

Higgin Metal Access Panels are of a design to provide quick and convenient access to hidden valves, joints and other critical places in heating, plumbing, refrigerating and air conditioning systems. They save materially in maintainence and entirely eliminate tearing down walls to get at parts requiring repairs. They fit flush with plastered surfaces (Type A) and may be papered or decorated over. Five stock sizes are available and special sizes can be had to order.



Higgin Type 70 Access Panels combine the features of a hinged and a lift-out door. Normally pivot hung, doors may be quickly removed with a screwdriver by loosening one screw and drawing back the operative pivot.

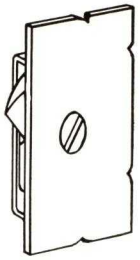
Specification

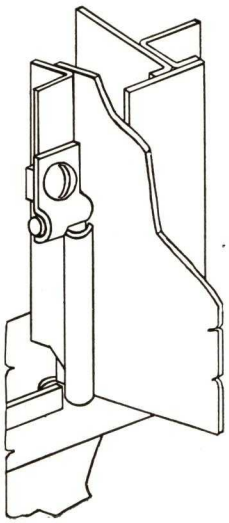
Access doors shall be Higgin Type 70 as manufactured by Higgin Products, Inc., Newport, Kentucky. Frames shall be of 16-US-gauge galvanized steel with fastening, key, or facing flanges of proper type for wall construction (see details below). Doors shall be 14-US gauge leveled steel, pivot hung to frame and removable. Each Access Door shall have automatic back out lock with bronze cam. Doors 30 in. or more in height shall have two cams and doors shall be reinforced with stiffeners on the concealed side. Access Panels shall be given a shop coat of paint baked on before leaving factory. Doors shall fit flush with frames. Key locks can be furnished when required.

INFORMATION FOR ORDERING

Symbol	K	M	P	R	S
Frame sizes.....	7½" x 11½"	12½" x 16½"	14½" x 18½"	18½" x 24½"	18½" x 30½"
Opening size recommended	8" x 12"	13" x 17"	15" x 19"	19" x 25"	19" x 31"
Approximate shipping weights....	6 lbs.	10 lbs.	13-14 lbs.	19-25 lbs.	23-30 lbs.
Number to crate..	20	20	12	10	10

Specify type flange—A, B or C (See illustrations).





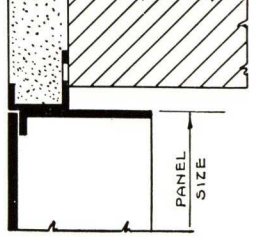
To the left is shown bronze cam lock with flush steel screw head bolt. Turning the cam in one direction locks the access door securely and turning in the opposite direction backs the lid out from the frame.

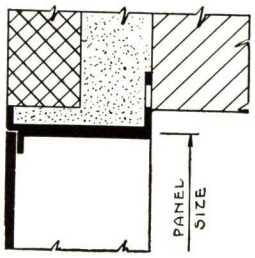
Lower illustration shows operative concealed pivot. The screw shown when slightly loosened permits the pivot to be drawn clear and door removed. Door may swing to 140 degrees.

Installations

John Shillito Co., Cincinnati, Ohio
Carew Tower, Cincinnati, Ohio
Marshall Field Bldg., Chicago, Ill.
Morrison Hotel, Chicago, Ill.
Board of Trade Bldg., Chicago, Ill.
Jean LaFitte Hotel, Galveston, Tex.
J. L. Hudson Stores, Detroit, Mich.
Floridian Hotel, Tampa, Fla.
First National Bank, Oklahoma City, Okla.
City Hospital, Springfield, Ohio
Notre Dame University Dormitory, South Bend, Ind.
Ohio Bank Bldg., Toledo, Ohio
Good Samaritan Hospital, Cincinnati, Ohio
Foshay Tower, Minneapolis, Minn.
Alamo National Bank, San Antonio, Tex.
Lerner Stores
Indiana Bell Telephone Co.
Illinois Bell Telephone Co.
Southern Bell Telephone Co.
Baltimore Trust Co., Baltimore, Md.
Penobscot Bldg., Detroit, Mich.
International House, Chicago University

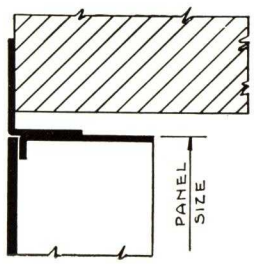
The plastered wall is the most common. The plaster key flange here measures over all in depth ⅝ in., the normal thickness of three-coat plaster work. We call this flange "A."





For walls faced with marble or tile where a thick cement ground is necessary, this (left) Type "B" flange is a requirement. The key flange is 1½ in. from face of door.

Occasionally it is necessary to have an access panel in a brick wall either unfinished or of glazed type. The "C" type flange (1 in. wide) fits this requirement.



MILCOR STEEL COMPANY

MILWAUKEE, WIS. CANTON, OHIO

CHICAGO, ILL. KANSAS CITY, MO. LA CROSSE, WIS.

SALES OFFICES IN PRINCIPAL CITIES

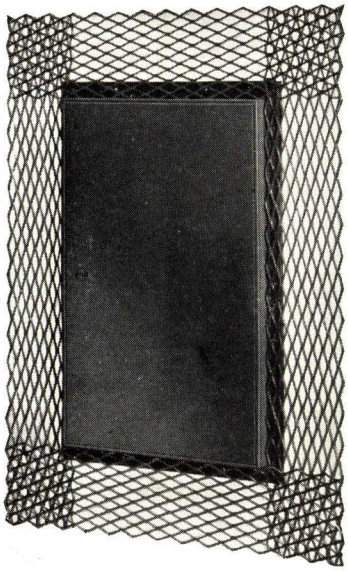
For Our Catalogs on Milcor Fireproof Products, Ventilators, Skylights and Steel Decks, see File Index

MILCOR METAL ACCESS DOORS

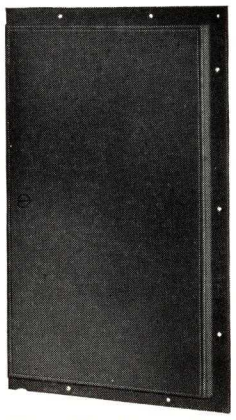
Milcor Metal Access Doors permit key points in plumbing, heating, electrical and refrigeration systems to be reached conveniently and easily. The expansion wing feature is important in preventing cleavage and cracking of plaster around openings, although door is available without expansion wing, if desired. Each side of the housing is shaped from a single piece of metal and the door itself fits flush with the frame and finished wall.

Ready access to valves, fittings, etc., is provided at the turn of a screw. Doors with invisible hinges furnished if desired. Expansion wing is made of 20 gauge metal and is 3 in. wide, but may be cut down where necessary.

Furnished with Key-lock at slight additional charge.



Note Double Reinforcement of Expanded Metal at Corners, Where Plaster Cracks Often Develop



Milcor Metal Access Door Without Expansion Wings

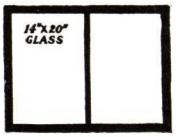
Easily placed where desired and requires no special framing. Strong, yet reasonably priced. Write for literature

CATALOGUE NUMBERS, SIZES, WEIGHTS

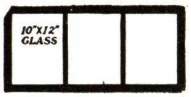
Catalog No.	Panel size, in.	Weight with expanded metal wings, lbs.	Weight without expanded metal wings, lbs.	Catalog No.	Panel size, in.	Weight with expanded metal wings, lbs.	Weight without expanded metal wings, lbs.
80	7½x11½	4¾	3¾	86	23½x35½	35½	33½
81	12½x16½	9⅛	8¾	90	7½x 7½	3¼	2½
82	14½x18½	11	10	91	11½x11½	5½	5½
83	18½x24½	17¼	16	92	15½x15½	11	10
84	18½x30½	21	19¼	93	23½x23½	24½	22½
85	23½x30½	30	28				

Gauges of Material: Door—No. 14 Ga. Housing—No. 16 Ga. on all sizes.

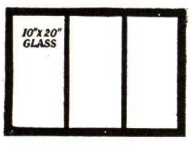
MILCOR ONE-PIECE BASEMENT WINDOWS



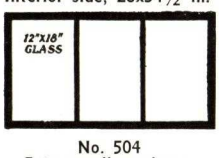
No. 501
Extreme dimensions:
Exterior side, 23x34 in.
Interior side, 26x37 in.



No. 502
Extreme dimensions:
Exterior side, 21x40 in.
Interior side, 24x43 in.



No. 503
Extreme dimensions:
Exterior side, 23x31½ in.
Interior side, 26x34½ in.



No. 504
Extreme dimensions:
Exterior side, 15x34 in.
Interior side, 18x37 in.

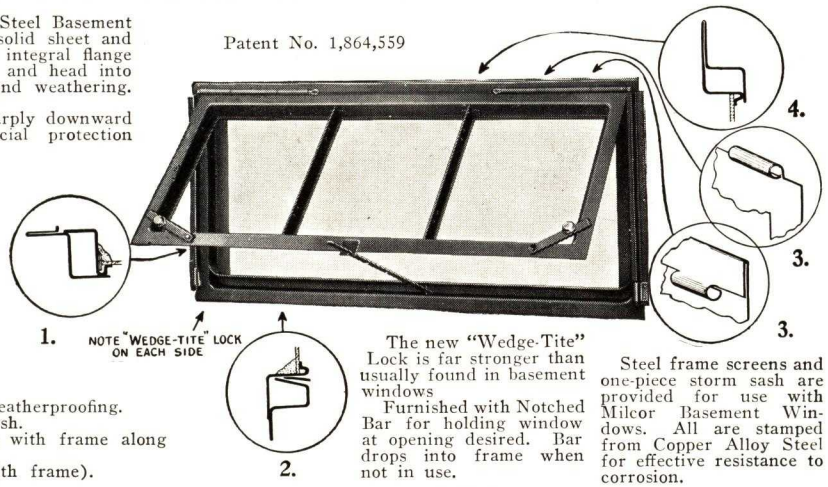
Frame—Milcor One-Piece Steel Basement Window is stamped from a solid sheet and formed without a joint. An integral flange projects from the jambs, sill and head into the masonry for anchorage and weathering.

Sill—Sill section slopes sharply downward and outward providing special protection against driving rain.

Sash—Formed in one piece including hinge sections. Glazing bars spot welded in place. Putty bed rests on channel formed when stamping sash. Glazing is done from inside.

Details of construction shown in circles are (left to right):
1. Two-point contact of sash with one-piece frame of jamb, insuring weatherproofing.
2. Sill detail of frame and sash.
3. Two-point contact of sash with frame along head piece.
4. Hinge details (integral with frame).

Patent No. 1,864,559

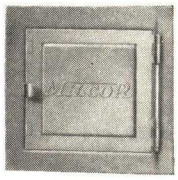


The new "Wedge-Tite" Lock is far stronger than usually found in basement windows

Furnished with Notched Bar for holding window at opening desired. Bar drops into frame when not in use.

Steel frame screens and one-piece storm sash are provided for use with Milcor Basement Windows. All are stamped from Copper Alloy Steel for effective resistance to corrosion.

Milcor Flue or Clean-out Door—Milcor Milk and Package Receiver

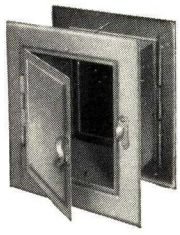


Stamped from heavy copper alloy sheet steel. Hinges are integral with frames and doors. No rivets or welding. Packed in cartons of six and twelve. Note sizes, shipping weights, etc., below.

In the Milk and Package Receivers two frames and doors are connected by an adjustable body which fits walls 5 to 14 in. thick.

Sizes	Shipping weight per carton of 6	Shipping weight per carton of 12
8x8 in.	20 lbs.	40 lbs.
8x10 in.	25 lbs.	50 lbs.
10x12 in.	30 lbs.	60 lbs.

For wall thickness adjustable body	Wall opening	Shipping weight, each
5 to 8 in.	9x11 in.	17 lbs.
8 to 14 in.	9x11 in.	17 lbs.



WALSH-SPENCER COMPANY

DISTRIBUTORS OF

Way "Loctor" Access Panels

TELEPHONE
KEnmore 6776

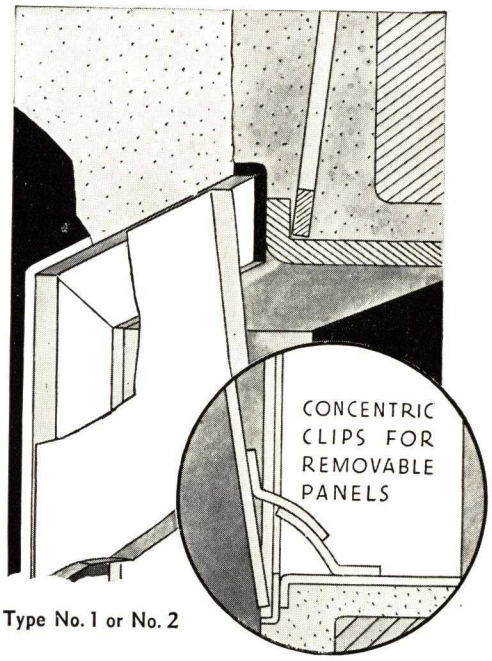
400 Boylston Street, BOSTON, MASS.

WAY "LOCTOR" ACCESS PANELS

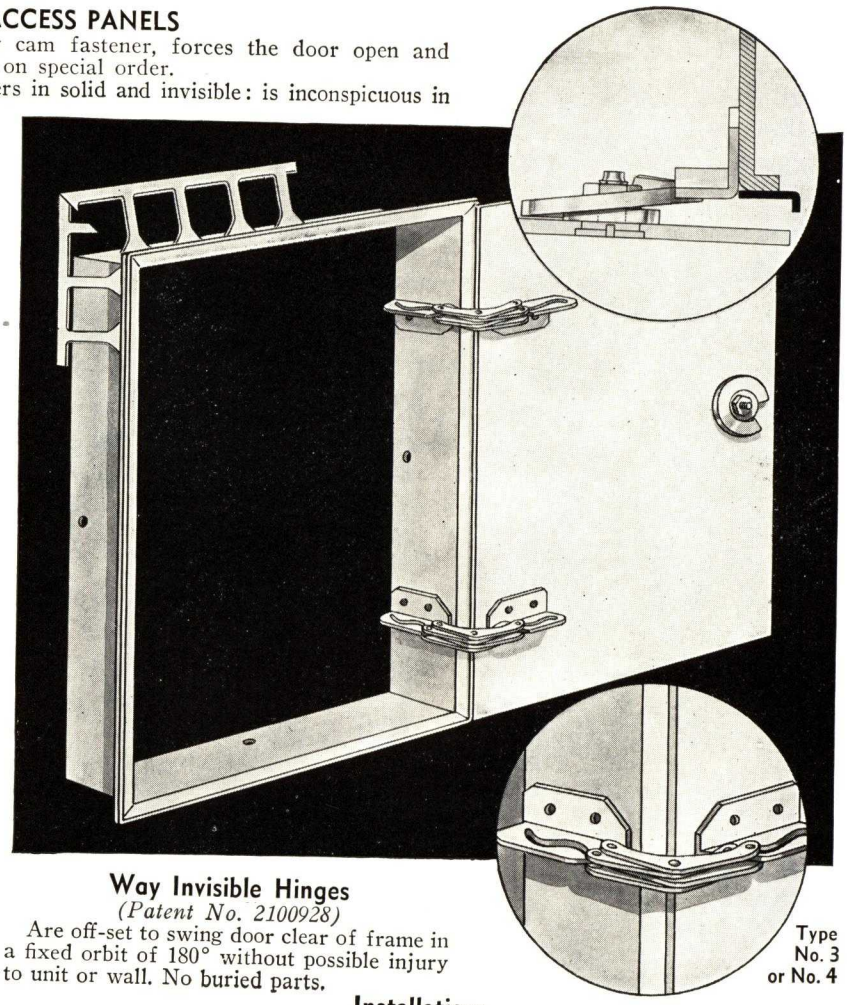
THE LOCTOR, Patent No. 1876115, a two-way cam fastener, forces the door open and closed. KEY-LOCTOR or other locks can be used on special order.

The shallow frame, (patent applied for), plasters in solid and invisible: is inconspicuous in masonry.

Our panel is specially adapted for use with air-conditioning work.



Type No. 1 or No. 2



Type No. 3 or No. 4

Way Flush Panels

Type 4—Hinged type has Way invisible hinges, Way "Loctor," and plaster-bond.

Type 3—Same as Type 4, omitting plaster-bond.

Type 2—Removable type has concentric clips at bottom, Way "Loctor" at top, and plaster-bond.

Type 1—Same as Type 2, omitting plaster-bond.

Caution: Panels for ceilings should be hinged—either type No. 3 or No. 4.

Note: Plaster-bond (if used) is adjustable to thickness of plaster.

Standard Door Sizes

8 x 8 in.	14 x 18 in.	18 x 24 in.
8 x 10 in.	16 x 16 in.	18 x 30 in.
12 x 12 in.	16 x 20 in.	24 x 24 in.
12 x 16 in.		

Above sizes carried in stock in Type 4. Other sizes and types on order.

Rough opening should be same size as door. Clear opening is 1 in. less than door. Doors 12-gauge cold rolled steel. Over sizes reinforced.

Special Panels

The No. 20 Way Panel for use with acoustic material, and No. 17 for use in tile walls are recommended where it is desirable to have the surface of the panel the same as the surrounding surface.

The Way "Loctor" lift-out floor cover for tile, terrazzo, and granolithic floors.

Special steel laundry chute doors.

Send for full size details of the above.

Way Invisible Hinges

(Patent No. 2100928)

Are off-set to swing door clear of frame in a fixed orbit of 180° without possible injury to unit or wall. No buried parts.

Installations

Buildings	*Architects*
Philips Exeter Academy, 6 buildings	Cram & Ferguson
Wheaton College, Massachusetts	Cram & Ferguson
Cathedral St. John the Divine, New York	Cram & Ferguson
Bennington (Vermont), College, 3 buildings	Ames & Dodge
Yale University, 4 buildings	
Wellesley College	Charles Z. Klauder
St. Josephs College, 2 buildings (West Hartford, Conn.)	Maginnis & Walsh
Massachusetts Memorial Hospital (Boston)	Kendall, Taylor & Co.
Taunton State Hospital, Massachusetts	Kendall, Taylor & Co.
New England Baptist Hospital	Kendall, Taylor & Co.
Beth Israel Hospital (Boston)	Stevens, Curtin & Mason
Pondville Hospital	Stevens, Curtin & Mason
Worcester City Hospital	Stevens, Curtin & Mason
400 Park Avenue, New York	Walker & Gillette
New House Office Building, Washington, D. C.	David Lynn
Addition to Nurses' Home, Newport (R. I.) Hospital	Wyeth & King
Burbank Hospital, Fitchburg, Mass.	James Purdon
Provident Institution for Savings	James Purdon
Hanchett Memorial Building, Lowell, Mass.	Appleton & Stearns
Boston City School	John M. Gray
Barnstable County Jail	Harold E. Mason
Wm. Filene's Sons Co. Store (Boston)	Richard Brunel
Parker House Alterations (Boston)	Desmond & Lord
Chapman Memorial Library, Milwaukee, Wis.	Allen, Collens & Willis
The Dayton Company Store, Minneapolis, Minn.	A. L. Weidt
Medical and Surgical Buildings, Howard, R. I.	E. O. Eckman
State Capitol, Salem, Ore.	Trowbridge & Livingston, and Francis Keally, Associate

SECTION 27

CONTINUED ⟶

ESTABLISHED 1908

TELEPHONE
MOtt Haven 9-4240

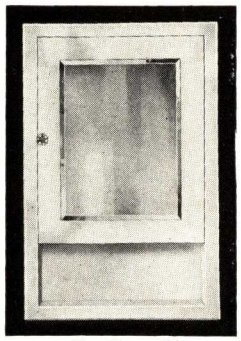
COLUMBIA METAL BOX CO.

260 East 143rd Street
NEW YORK, N. Y.

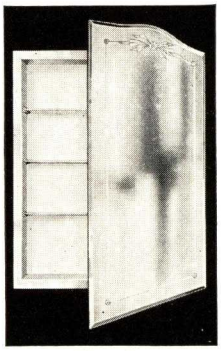
STRUCTURAL FEATURES OF COLUMBIA-QUALITY STEEL CABINETS

Heavy gauge furniture sheet steel, electrically spot-welded. Doors hung on unusually strong hinges and when closed, present a solid front; no cracks or crevices for dust. Shelves are bulb edge clear glass, adjustable every ¾ in. Ornamental glass knobs; nickel knobs on Venetian mirror and chromium frame cabinets; catch of bullet type. Exposed parts finished with a permanent smooth white enamel. Other colors furnished in quantity.

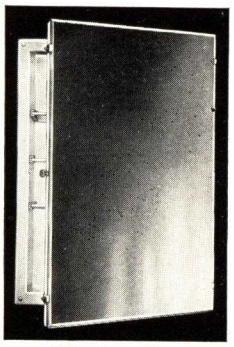
COLUMBIA STANDARD CABINETS



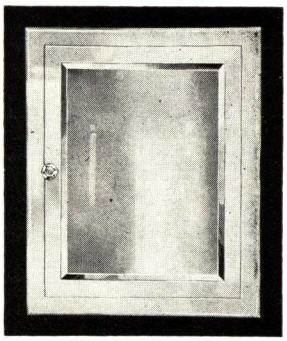
No. 11 or 21



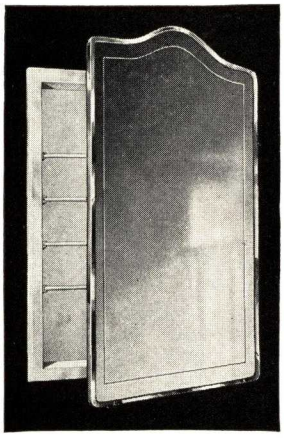
Venetian



All-mirror Front



No. 10, 20 or 30

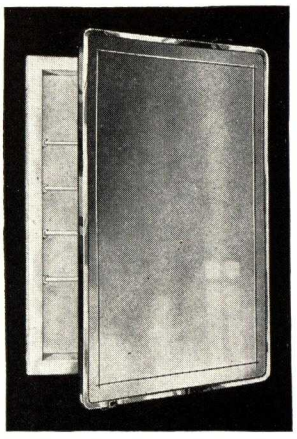


Chromium Frame Venetian

COLUMBIA-QUALITY STEEL CABINETS

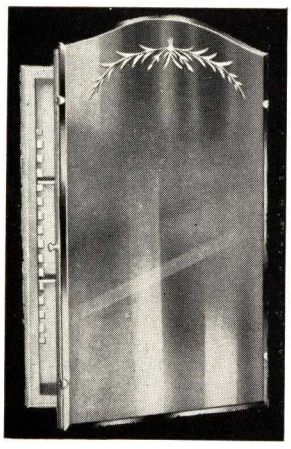
Cat. No.	Over all, in.	Wall opening, in.	Mirror, in.
01622CV	16¼x22¼	14 x18 x3	16 x22
11724CV	17⅝x24	14½x18½x3	17⅛x23¾
21926CV	19⅜x26	16½x20½x3	19⅛x25¾
31928CV	19⅜x28	16½x22½x3	19⅛x27¾
42130CV	21⅜x30¼	19 x25 x3	21⅜x30
01620CS	16¼x20¼	14 x18 x3	16 x20
11722CS	17⅜x22	14½x18½x3	17⅛x21¾
21924CS	19⅜x24	16½x20½x3	19⅛x23¾
31926CS	19⅜x26	16½x22½x3	19⅛x25¾
42128CS	21⅜x28¼	19 x25 x3	21⅜x28
01622BV	16¼x22¼	14 x18 x3	16 x22
11724BV	17⅜x24	14½x18½x3	17⅛x23¾
21926BV	19⅜x26	16½x20½x3	19⅛x25¾
31928BV	19⅜x28¼	16½x22½x3	19⅛x27¾
42130BV	21⅜x30¼	19 x25 x3	21⅜x30
01620BS	16¼x20¼	14 x18 x3	16 x20
11722BS	17⅜x22	14¼x18½x3	17⅛x21¾
21924BS	19⅜x24	16½x20½x3	19⅛x23¾
31926BS	19⅜x26	16½x22½x3	19⅛x25¾
42128BS	21⅜x28¼	19 x25 x3	21⅜x28
†10A	16⅝x20⅝	14½x18½	12x16
10B	16⅝x20⅝	14½x18½	12x16
*10P	16⅝x20⅝	14½x18½	12x16
†20A	18⅝x22⅝	16½x20½	12x16
20B	18⅝x22⅝	16½x20½	12x16
20C	18⅝x22⅝	16½x20½	14x18
30B	20⅝x26⅝	18½x24½	16x22
†11A	16⅝x26⅝	14½x24½	12x16
11B	16⅝x26⅝	14½x24½	12x16
21B	18⅝x28⅝	16½x26½	12x16
21C	18⅝x28⅝	16½x26½	14x18
†10AW	16⅝x20⅝	Surface mounting	12x16
10BW	16⅝x20⅝		12x16
†01216AW	14 x18		12x16
11216AW	16 x20		12x16
11628V	16 x28	14 x24	16x28
21830V	18 x30	16 x26	18x30
32032V	20 x32	18 x28	20x32
01624V	16 x24	14 x20	16x24
01628V	16 x28	14 x24	16x28
01622AM	16 x22	14 x20	16x22

Key explanation: V—Venetian; BV—Black frame Venetian; CV—Chromium Venetian; CS—Chromium straight; AM—All-mirror front.
*Plain plate glass mirror.
†Plain mirrors: not plate glass.
Key explanation: A, plain mirror; B and C, beveled mirror; W, surface mounting.
Note: *Styles CV, CS, BV, BS, V and AM can be furnished with Perfectlite Adjustable Mirror—add letter P to catalogue number if desired.*



Chromium Frame Imperial Venetian

COLUMBIA "ECONOMY" CABINETS

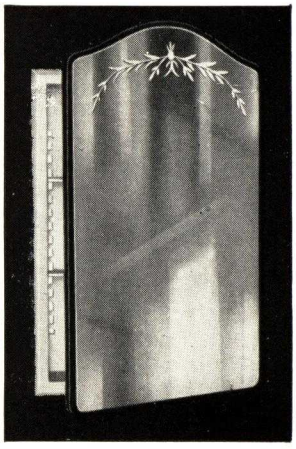


Venetian

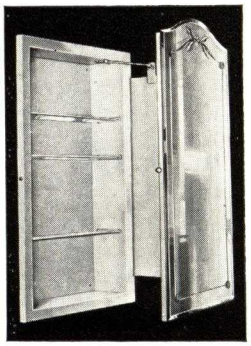
This new line of Columbia Venetian Cabinets meets the demand for cabinets of conservative design, rich appearance, the utmost utility—and remarkably low cost. The plain Venetian model has beveled edges and the mirror is affixed to the door with four small chromium plated clips. On the framed model, the mirror is mounted in a narrow one-piece channel frame. This frame comes in either chromium (over brass) or black enamel (over cold rolled steel).

Recess type has 1⅜-in. return flange and slot for disposal of used razor blades. Wall type has a one-piece full return. Adjustable shelf supports allow for adjustment of glass shelves every ¾ in. Doors are removable to facilitate installation. Baked white enamel finish. Figure numbers in table use same key as table above.

Cat. No.	Over all, in.	Wall opening, in.	Mirror, in.
1422V	13⅝x19¾	12½x18½	14x22
1422VW	13⅝x19¾		14x22
1422BV	13⅝x19¾	12½x18½	14x22
1422BVW	13⅝x19¾		14x22
1422CV	13⅝x19¾	12½x18½	14x22
1422CVW	13⅝x19¾		14x22



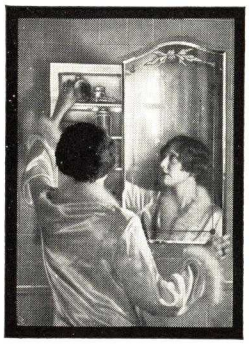
Black Frame



COLUMBIA PERFECTLITE CABINET

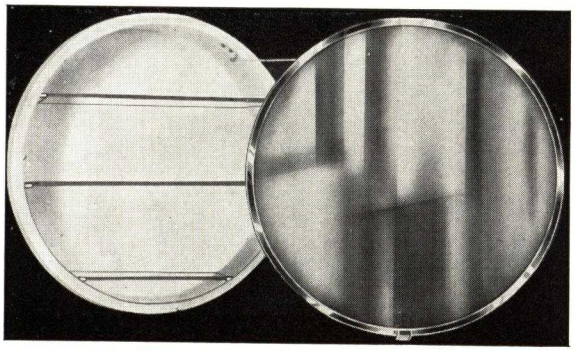
With Adjustable Mirror

Mirror can be swung to any angle to suit convenience of user. The extended hinge arrangement, on which mirror swings, is concealed when door is closed; it is sturdily built and cannot get out of alignment. Access to the cabinet is possible with the mirror in use.



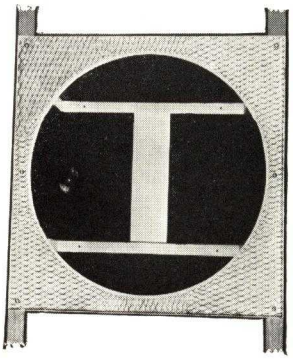
COLUMBIA CIRCULAR CABINET

This new circular model embraces a revolutionary idea. It is unusually handsome and durable, and, at the same time, offers many utilitarian properties. Mirror is 20 ins. in diameter and encased in a one-piece chromium plated brass frame.



Catalog number: 20 CM. Outside flange diameter: 19½ in. Inside diameter: 18 in. Cabinet may be surface mounted by means of metal adapter.

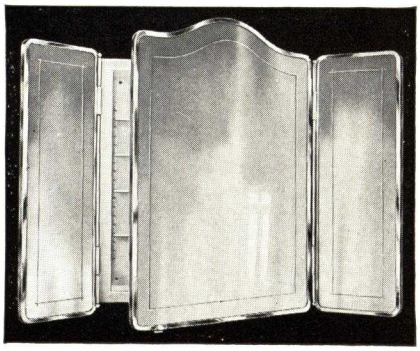
In order to facilitate installation, the circular model is accompanied by a 20-gauge steel installation buck to which is welded wire lath, the over-all measurement of which is 21x21 in. The wire lath outer shell is fastened to studding as illustrated. Plaster or tiling is brought flush to edge of circular opening.



COLUMBIA WING MIRROR CABINET

Mirror arrangement is ideal for shaving, hair dressing, make-up, etc. Shelves are adjustable every ¾ in. and accommodate a large quantity of drugs and cosmetics. Center mirror can be furnished mitre-lined or with a floral design.

In table at left: "C" denotes chromium frame; "B" denotes black frame.



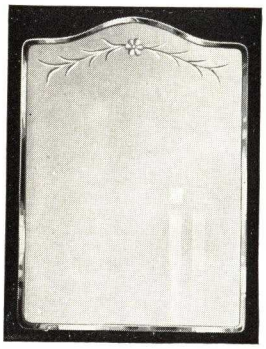
Wing Mirror Cabinet

Cat. No.	Over all, in.	Wall opening, in.	Mirror, in.	Wings, in.
2-WM-C	36x26	18x20½x3½	19x25½	8x23¾
2-WM-B	36x26	18x20½x3½	19x25½	8x23¾
0-WM-C	33x22½	15x17½x3½	16x22	8x20
0-WM-B	33x22½	15x17½x3½	16x22	8x20

COLUMBIA FRAMED WALL MIRROR

Of heavy plate glass and mounted in one-piece channel frame. Frames have a heavy steel back drilled with special holes for mounting and are finished chromium plated or black.

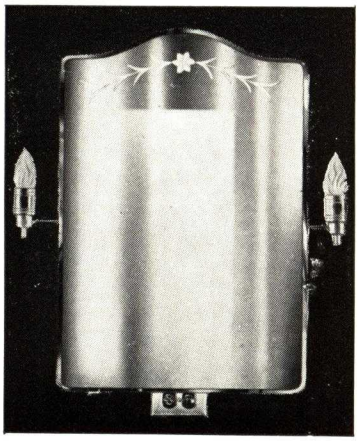
In table at right: *Mirrors can be furnished either mitre-lined or with floral design. **Furnished in plain plate glass only. †Mirrors furnished with mitre-line only.



Framed Mirror for Wall Mounting

Venetian top		Straight top	
Cat. No.	Mirror, in.	Cat. No.	Mirror, in.
*1622V	16x22	**1620S	16x20
*1724V	17x24	†1722S	17x22
*1926V	19x26	†1924S	19x24
*1928V	19x28	†1926S	19x26
*2130V	21x30	†2128S	21x28

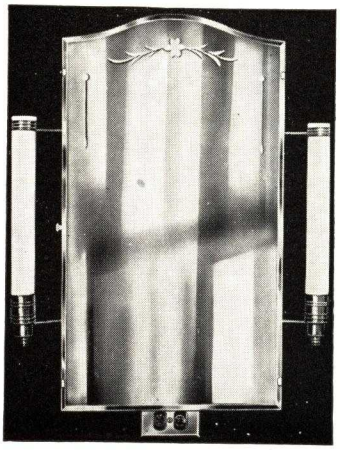
LIGHTING FIXTURES FOR COLUMBIA CABINETS



Attractive lighting fixtures with switch and convenience outlet can be furnished on all Columbia Cabinets—except the Perfectlite models.

At left is a Columbia chromium frame Venetian cabinet showing the arrangement of the standard type lighting fixtures, switch and outlet. At the right, a similar cabinet is equipped with our new tubular lighting fixtures.

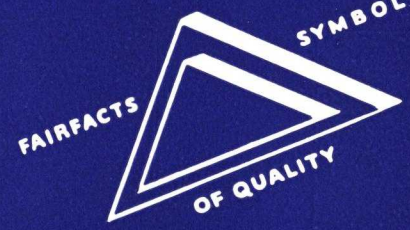
All wires are entirely enclosed by an angle frame around the inside of the flanges. The outlet box is welded to the front channel so that it comes flush with tile or plaster wall. Wall opening remains the same *plus* an additional opening, 3¼ in. high by 4 in. wide, centered at bottom.



MEMORANDA

Fairfacts

BATHROOM ACCESSORIES VITREOUS CHINA LINE "CHINACHROME" LINE



The Fairfacts Company

INCORPORATED

234 WEST FOURTEENTH ST.

NEW YORK, U.S.A.

CABLE ADDRESS
"FAIRFACTS"
CODE ABC, 6TH EDITION
AND BENTLEY'S

PLANT
FAIRFACTS ST.
TRENTON, N.J.

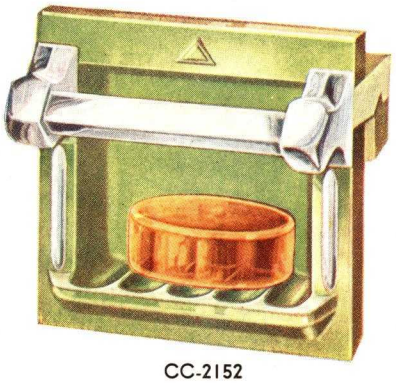
CATALOGUE No. 38

Fairfacts Fixtures

VITREOUS CHINA BATHROOM ACCESSORIES

FAIRFACTS SYMBOL OF QUALITY

FOUR DISTINCTIVE LINES



CC-2152
A Combination of Colored China and Chromium Plated Brass.

• "CHINACHROME" LINE

Fairfacts "Chinachrome" Bathroom Fixtures, described and illustrated on the following page, are Fairfacts china accessories — white, black and colored — trimmed with chrome-plated metal — **a decided innovation.**

• "ROYAL LINE" — DE LUXE

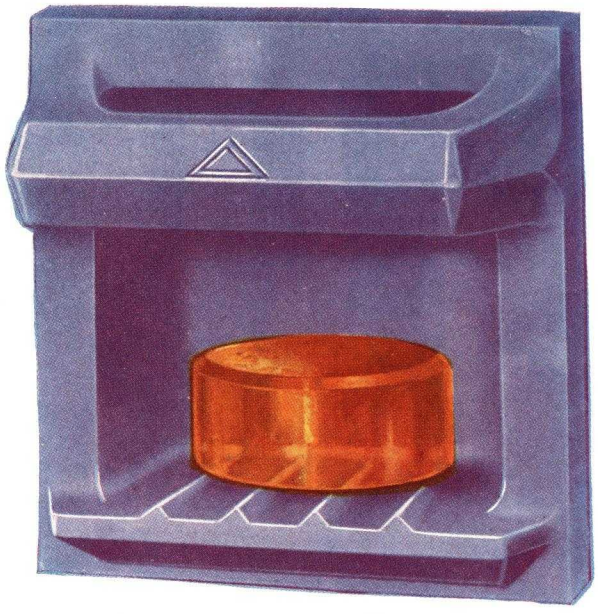
A conservative Modernistic Design. No finer accessories of the china type ever produced. Recommended for the finest and most modern bathrooms. Royal Line white finish is our "Mellotone" a very light cream satin, a decidedly superior finish that is unusually attractive, a good match for white tile, and a finish that looks well with colors that you would use with a very light cream. Patented July 21, 1928; Sept. 22, Nov. 3, Nov. 10, 1931.

• "SAMSONCHINA" LINE

A unique line of china accessories attachable to the wall with concealed screws—see page 14.

• "F-LINE" — THE ORIGINAL LINE

With a new design with more attractiveness. The first recessed china accessories made in the world. Patented Feb. 13, Aug. 21, Aug. 28, Sept. 11, Oct. 23, 1917; Feb. 12, May 28, July 16, Apr. 15, July 29, 1919; Dec. 29, 1931; April 12, 1932. Large details of this new design are shown on this page

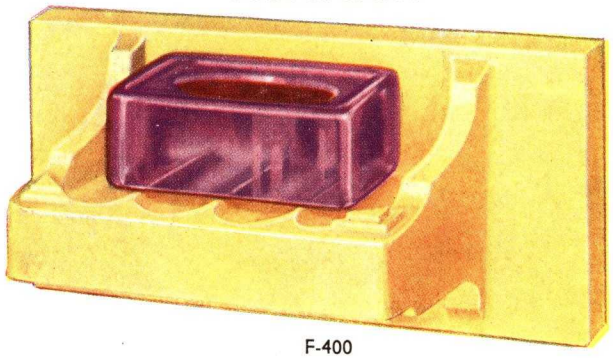


F-152

The Double Triangle

A small triangle, superimposed on a larger one, now appears on the exposed surface of Fairfacts Accessories; an attractive identification of a fine product. This symbol is our "Hall Mark" and your guarantee.

MADE IN U. S. A.



F-400

F-300

SPECIAL NOTE: Fairfacts Accessories are set by the tile contractor, and for this reason should be included in the tile contract.

• FAIRFACTS "ETERNITE" COLORS

Colors fired into genuine vitreous china. Colors are available at short notice. Many shades are made, also special colors to order from your samples. White, "Mellotone white", and Black are regular glazes. "Mellotone white", is a beautiful, soft light cream; when applied to accessories, goes well with the usual white tile and with colors that harmonize with light cream. We call these colors "Eternite Color", because of their extreme durability.

The Fairfacts Company
INCORPORATED
234 West 14th Street, New York, N. Y.
PLANT: Fairfacts Street, Trenton, N. J.
Cable Address: "FAIRFACTS"
CATALOG No. 38

Codes: A.B.C. 6th Edition and Bentley's

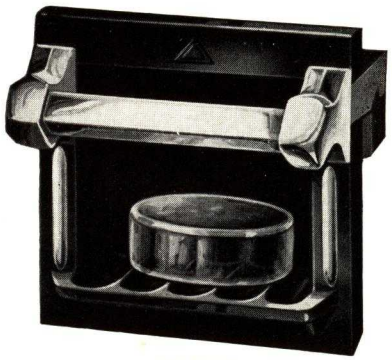
Copyrighted 1938

FAIRFACTS "Chinachrome" LINE

AN ATTRACTIVE AND INTERESTING COMBINATION OF FAIRFACTS CHINA ACCESSORIES AND CHROMIUM PLATED METAL

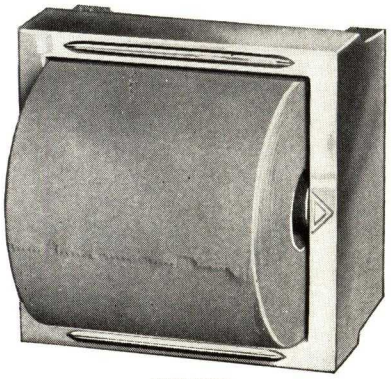
A selection of Fairfacts China Accessories in white or black or in color is available to harmonize with the tile, while the chrome decoration carries out the chromium motif of the plumbing fixtures.

Thus is presented a decorative scheme in accessories that is most attractive, practical and inexpensive.

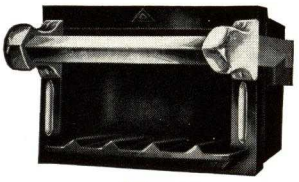


CC 2152

Soap holder is black china; grip, supporting posts and decorative strips are heavy brass Chromium Plated.



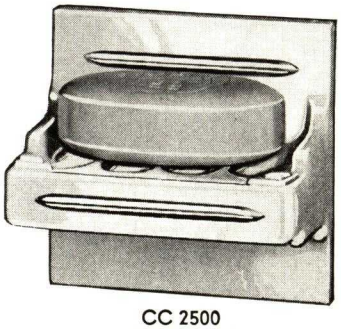
CC 2002
6" x 6"



CC 2195
6" x 4¼"

CC 2115
6" x 6"

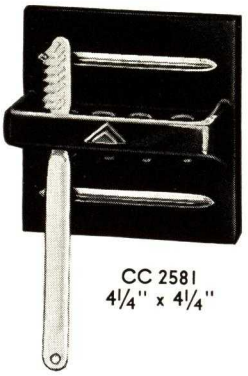
CC 2503
4¼" x 4¼"



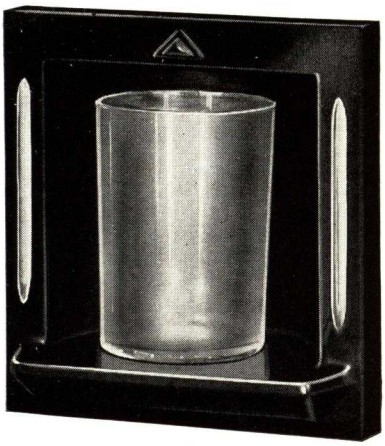
CC 2500
4¼" x 4¼"

CC 2517
4¼" x 4¼"

CC 2317
Dowel Back



CC 2581
4¼" x 4¼"



CC 2160
6" x 6"

CC 2331
Dowel Back

CC 2130
Dowel Back

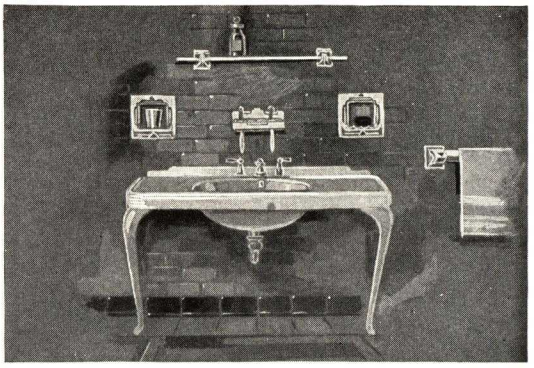
CC 2300 Dowel Back

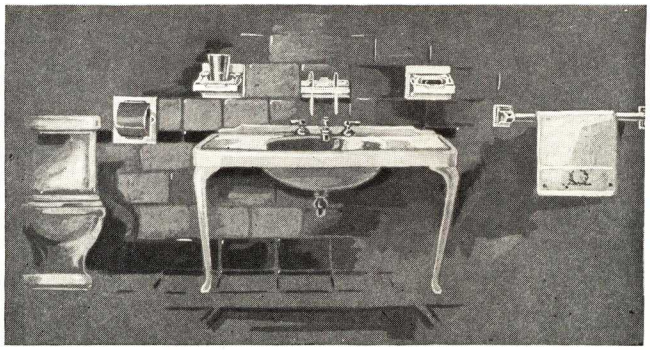
Look for the *Double Triangle*

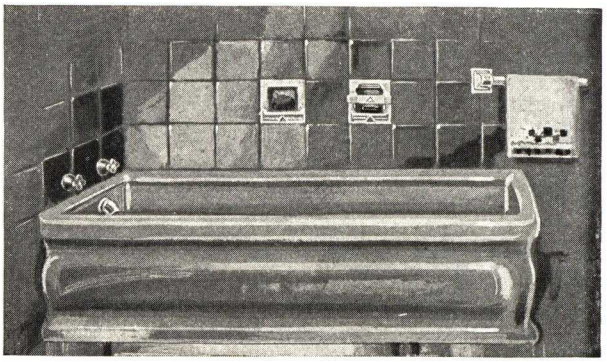
ROYAL LINE

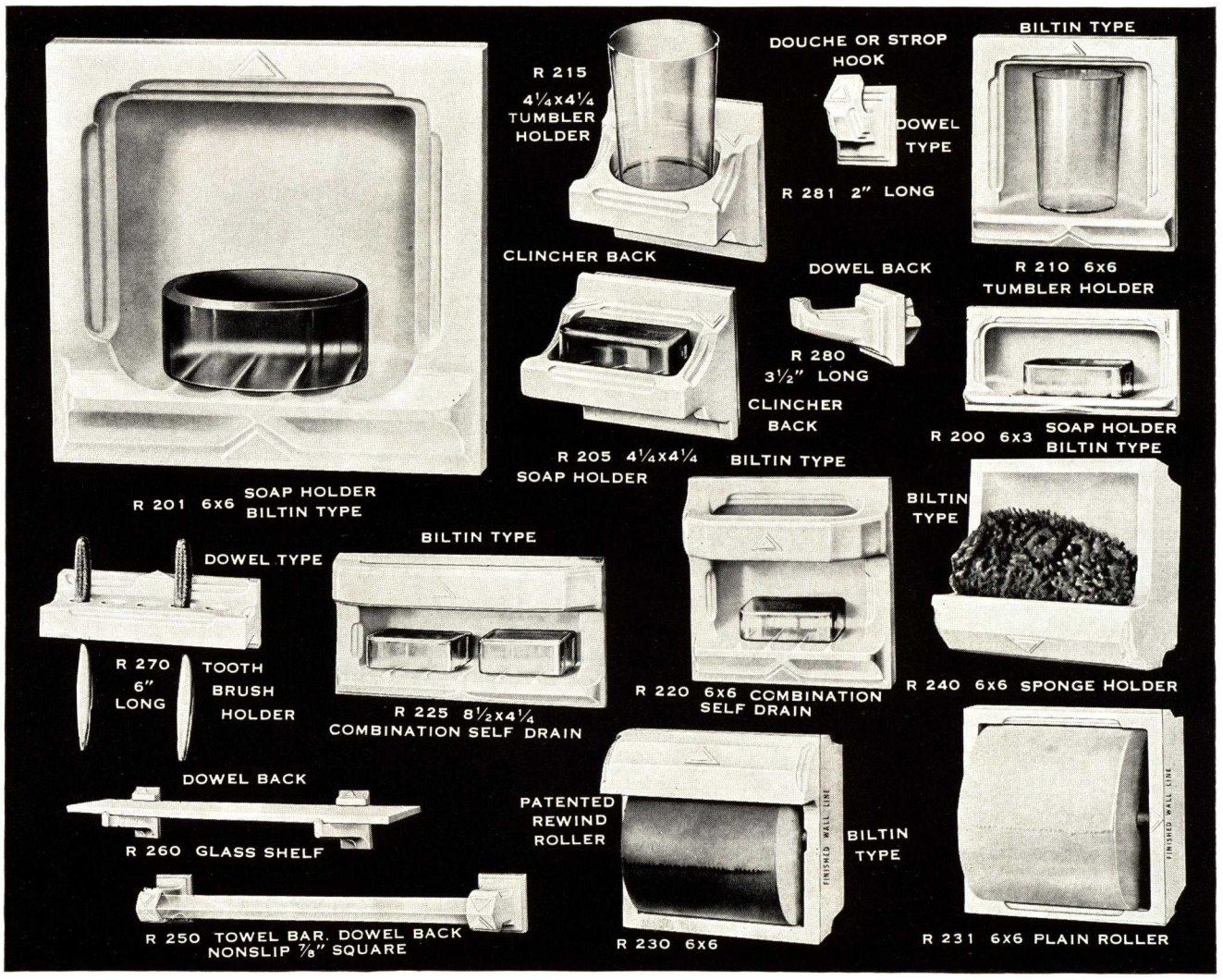
DE LUXE

ROYAL LINE De Luxe Elaborate and Ornamental China Bathroom Accessories available in White, Black, Colors or "Mellotone", a very light cream satin, a decidedly superior finish that is unusually attractive, a good match for white tile, and a finish that looks well with colors that you would use with a very light cream.









The following fixtures (not illustrated) with drain spouts can be furnished; F 109, 6" x 3" Recess Soap Holder; F 169, 12" x 6" Double Soap Holder and Grip; F 139, 12" x 6" Double Soap Holder.

FAIRFACTS "F" LINE — REGULAR LINE — NEW DESIGNS

SPONGE TOOTH BRUSH AND RAZOR BLADE HOLDERS HOOKS, DOORSTOPS, GRIPS AND ELECTRIC LIGHT FIXTURES

F 331 6x3 DOWEL BACK

F 525 4¼x4¼

F 425 3x3

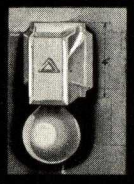
F 450 6x3 CLINCHER BACK

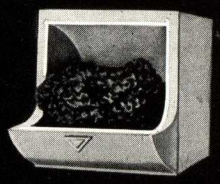
F 452 12x3 CLINCHER BACK

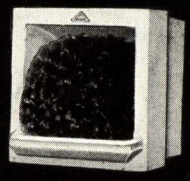
F 550 8½x4¼ CLINCHER BACK

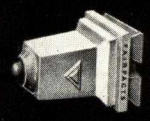
F 581 4¼x4¼ CLINCHER BACK

F 481 6x3 CLINCHER BACK

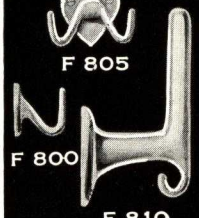

F 710 4x4


F 170 6x6


F 175 6x6


F 700 3x3

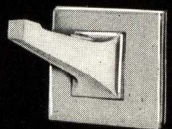
F 805

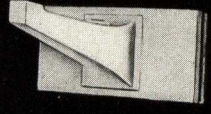

F 800 F 810

F 342 DOWEL BACK

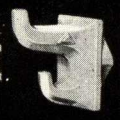
F 341 DOWEL BACK

F 340 DOWEL BACK


F 590 4¼x4¼ CLINCHER BACK


F 490 6x3 CLINCHER BACK

F 343 DOWEL BACK

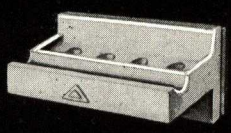

F 344 DOWEL BACK

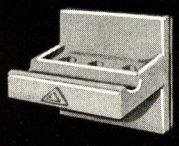
MISCELLANEOUS COMBINATION FIXTURES

F 317 DOWEL BACK

F 417 6x3 CLINCHER BACK

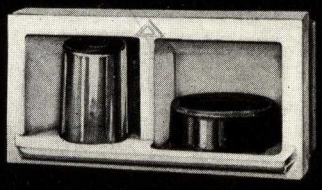
F 404 9x3 CLINCHER BACK

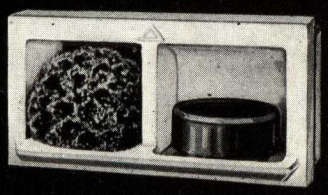

F 405 6x3 CLINCHER BACK

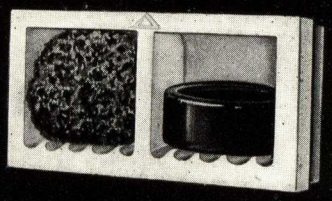

F 505 4¼x4¼ CLINCHER BACK

F 504 8½x4¼ CLINCHER BACK

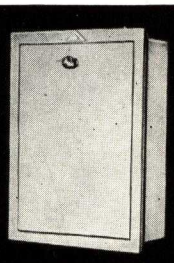
F 517 4¼x4¼ CLINCHER BACK

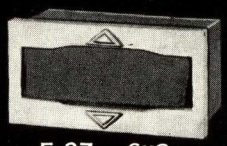

F 119 12x6

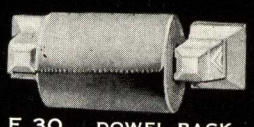

F 171 12x6

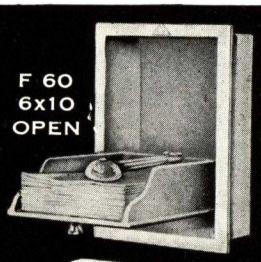

F 172 12x6

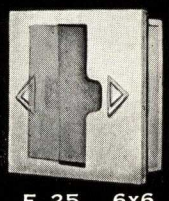
PAPER HOLDERS

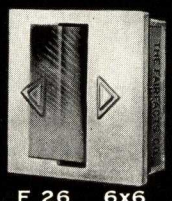

F 60 6x10 CLOSED

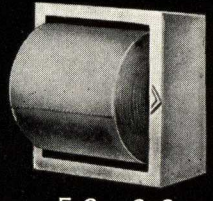

F 27 6x3

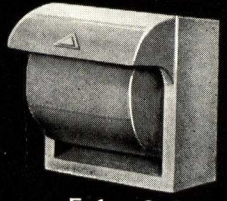

F 30 DOWEL BACK

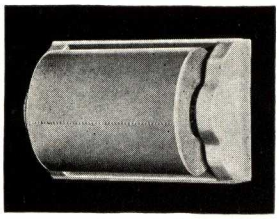

F 60 6x10 OPEN

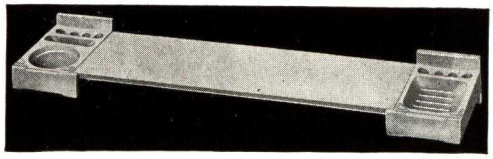

F 25 6x6

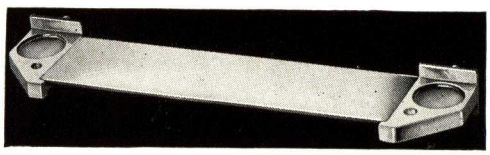

F 26 6x6

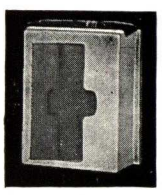

F 2 6x6


F 1 6x6


F 5 6x4¼ Paper Holder


F 329 Glass Shelf "Dowel Back" Holds 8 Tooth Brushes, 2 Tumblers and Soap

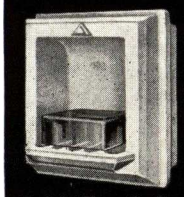

F 379 Glass Shelf "Dowel Back" Holds 2 Tooth Brushes and 2 Tumblers.


F 28 Surface Type Paper Holder

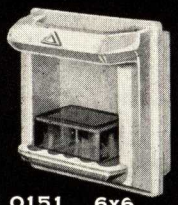
Look for the ▲ *Double Triangle*

Fairfacts Fixtures

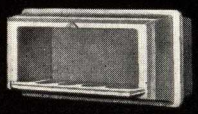
SEMI-RECESS FIXTURES



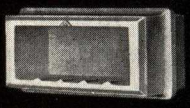
F 0115 6x6



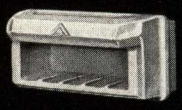
F 0151 6x6



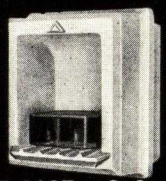
F 0100 6x3



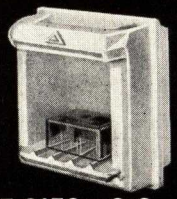
F 0120 6x3



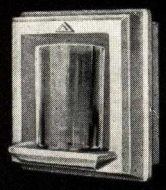
F 0158 6x3



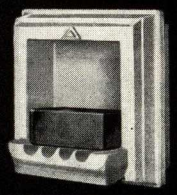
F 0125 6x6



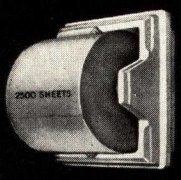
F 0152 6x6



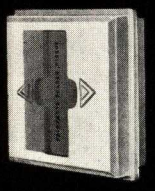
F 0160 6x6



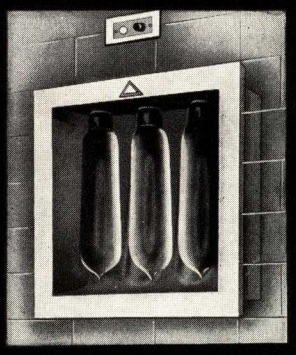
F 0125X 6x6



F 03 6x6



F 025 6x6



F 180 15x15 RADIATOR

ROUND TOWEL BARS

F 300 DOWEL BACK

F 430 6x3 CLINCHER BACK

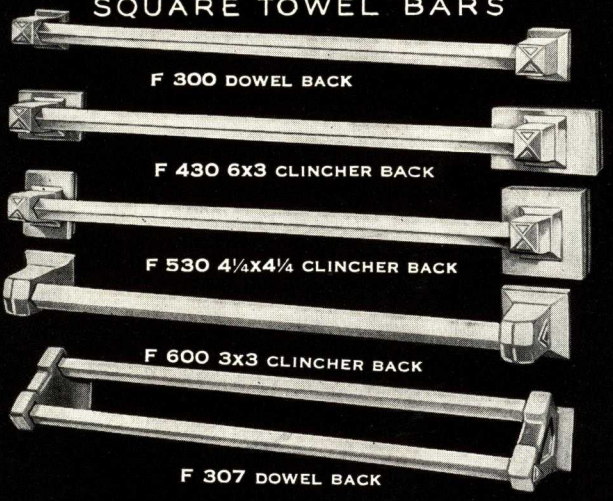
F 530 4¼x4¼ CLINCHER BACK

F 600 3x3 CLINCHER BACK

SQUARE BAR DOWEL BACK

F 310 1⅛x1⅛

SQUARE TOWEL BARS



F 300 DOWEL BACK

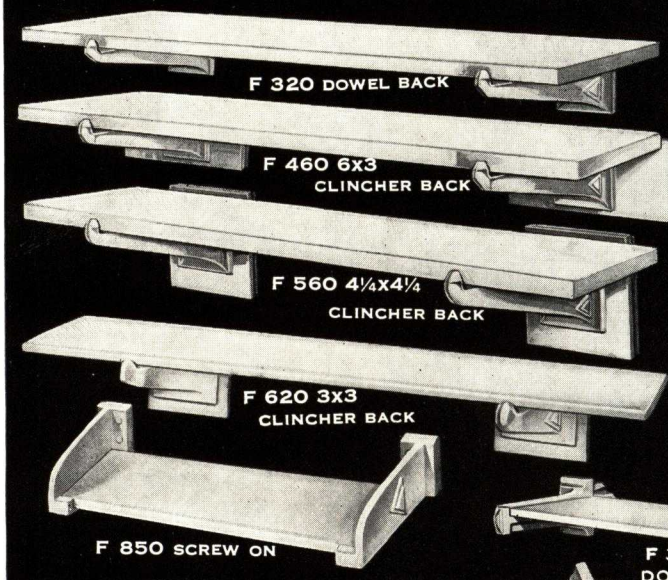
F 430 6x3 CLINCHER BACK

F 530 4¼x4¼ CLINCHER BACK

F 600 3x3 CLINCHER BACK

F 307 DOWEL BACK

GLASS SHELVES



F 320 DOWEL BACK

F 460 6x3 CLINCHER BACK

F 560 4¼x4¼ CLINCHER BACK

F 620 3x3 CLINCHER BACK

F 850 SCREW ON

F 325 DOWEL BACK

F 465 6x3 CLINCHER BACK

F 565 4¼x4¼ CLINCHER BACK

F 625 3x3 CLINCHER BACK

F 324 DOWEL BACK

F 323 DOWEL BACK

WHEN USED AS LEFT HAND BRACKET

SHELF RESTS ON THIS LEDGE

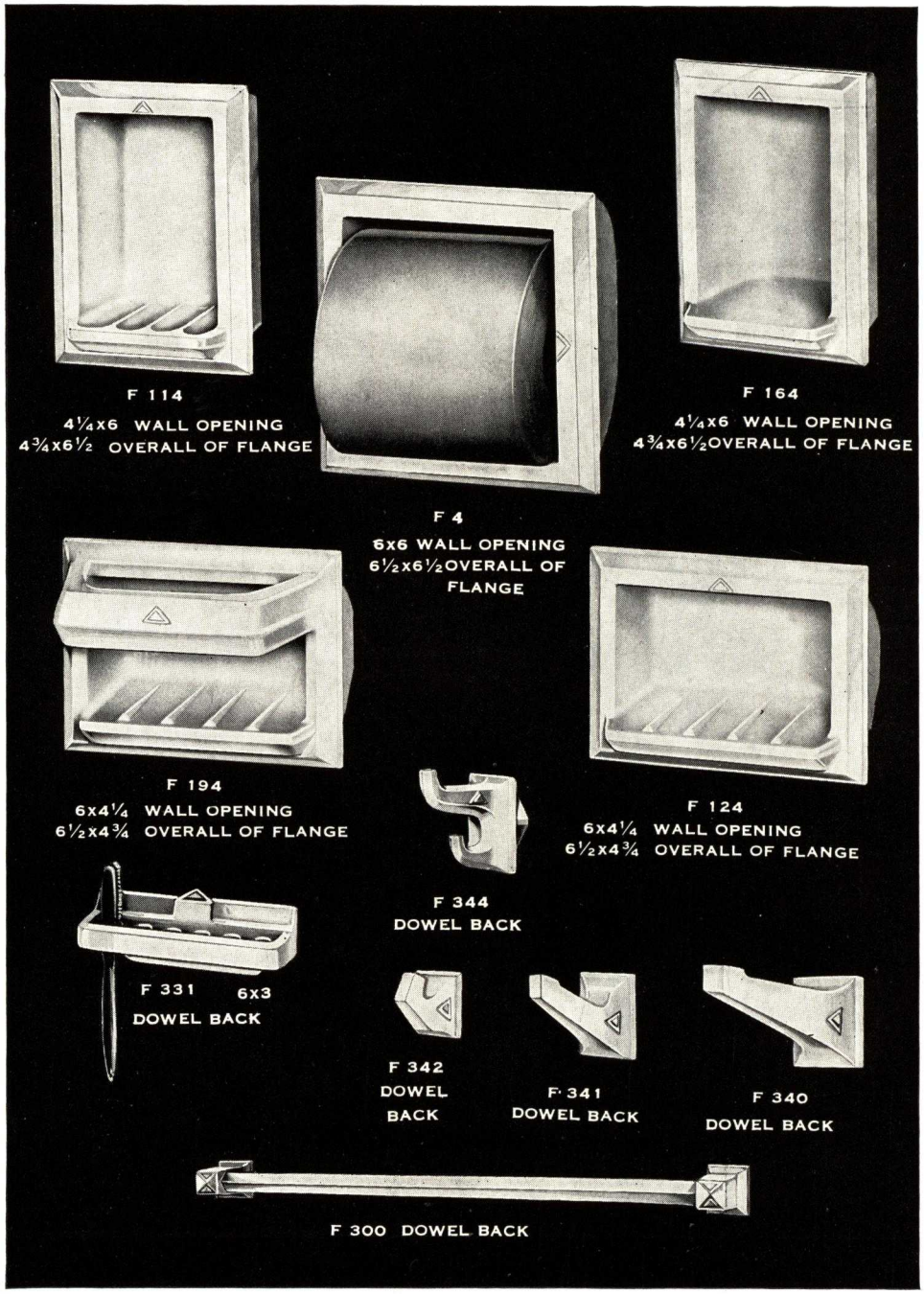
WHEN USED AS RIGHT HAND BRACKET

FAIRFACTS **FLANGED** FIXTURES

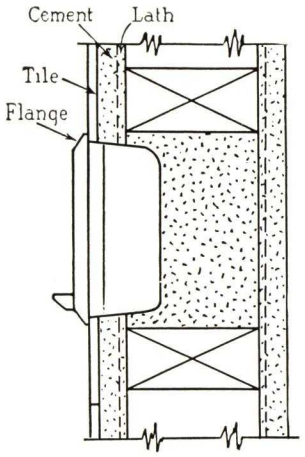
FULL RECESS ACCESSORIES

With Thin Bevelled Flanges to Cover Edge of Wall Opening

Adaptable For Any Type Wall Where A Full Recess Accessory Can Be Used

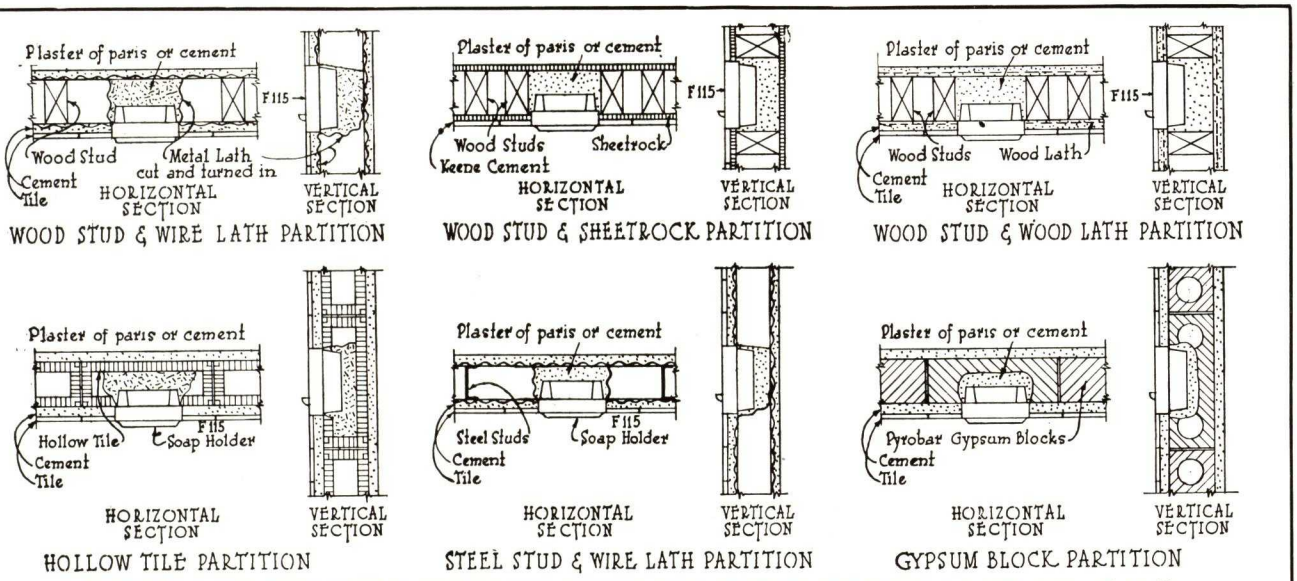


Drawing showing Flanged Fixture installed illustrating practicability of the flange to cover wall openings.



DOWEL BACK

The Accessories shown at the left are designed with Flanges to cover wall openings and are suggested for installation with the flanged accessories shown above them.



° METHODS OF INSTALLING FAIRFACTS BILTIN FIXTURES IN VARIOUS TYPES OF WALLS °

Fairfacts Fixtures Should Be Included in the Construction Work and Mentioned in the Tile Specifications

Used with Any Type of Wall Construction or Surface Finish

Interior Construction	Bond	Wall Finish
Wood stud	Metal lath	Tile
Terra cotta or hollow tile	Wood lath	Plaster
Brick	Plaster board	Keene's cement
Gypsum block	Sheetrock	
Metal stud walls (thin)		

Made in tile sizes—select proper size to fit the tile.

Fairfacts Accessories are made to fit these unit sizes or their multiples, namely, 6x3, 6x6 and $4\frac{1}{4}$x$4\frac{1}{4}$ in.

Types of Fairfacts Fixtures and Methods of Installation

BILTIN OR RECESSED TYPE—These are recessed almost entirely into the walls, and cemented in place when the tile or other wall finish is put on. Greatest depth required in the wall is $3\frac{1}{4}$ in., except F-180 radiator, which needs 5 in. When used on tiled walls they should be included in the tile contract.

Recessed fixtures that are 6x3, 6x6, 6x9 and 6x12-in. require little cutting of tile when set in 6x3 or 6x6-in. tile. These fixtures can be set in $4\frac{1}{4}$x$4\frac{1}{4}$-in. tile, but require more cutting. All $4\frac{1}{4}$x$4\frac{1}{4}$, 6x$4\frac{1}{4}$ and $8\frac{1}{2}$x$4\frac{1}{4}$-in. recessed fixtures are used with $4\frac{1}{4}$x$4\frac{1}{4}$-in. tile.

SEMI-RECESS TYPE—Recessed into the wall but 1 in. Are set like recess type and are used in thin partition, or where piping or other obstructions are found in walls. Are cemented in place and have a flange that overlaps the aperture.

PROJECTING TYPES—Have special backs or wall attachments cementing to wall.

These backs are of two kinds: "Dowel Back Type" and "Clincher" Back Type."

DOWEL BACK FIXTURES—Depth required in wall is 1 in. Dowels are heavy and strong and make a substantial wall attachment.

When Set in Tile Walls—Usually set after the tile is in place. A hole of size and depth of dowel, but slightly larger, is made in wall. Dowel is covered with rich cement or plaster of paris and fixture pushed into place.

Note: Make holes in tile preferably at intersection of tile joints. Be sure hole is not too large to be concealed by fixture.

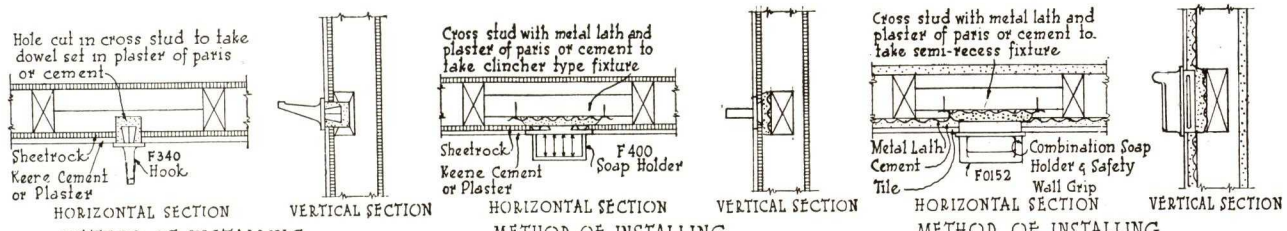
When Set in Keene's Cement or Plaster Walls—Hole is cut in wall and fixture pushed into place as for tile wall, but it is desirable that pieces of studding with their wide sides towards front be nailed to studs (flush with face of studs) and hole cut in the pieces of studding (see illustration).

CLINCHER BACK FIXTURES—Made in tile sizes to avoid cutting the tile. Depth needed in wall is $\frac{3}{4}$ in.

When Set in Tile Walls—Installed when setting tile or opening of right size is left in tile work and fixtures set later. Make openings deep enough for liberal quantity of rich cement or plaster of paris and also cover the back of fixtures and fill the clinchers with the cement. Then tamp fixtures into place until glazed surface is flush with the finished wall.

When Set in Keene's Cement or Plaster Walls—Set fixtures before applying finish coat to wall. Expose the lath where fixtures are to go and set as for tile walls.

Note: For walls with wood stud interior and sheetrock or plaster board bond, see illustration for method of preparing opening. After opening is prepared set fixtures as described for "When set in Tile Walls." See page 10 for more installation data.



° INSTALLATION OF DOWEL. CLINCHER & SEMI-RECESS TYPE OF FIXTURE °

Fairfacts Towel Bars with China Posts—See Page 7

Bars are of several kinds, i. e.—7/8 in. square set edge up, called "non-slip" because towels do not slip off.

Made in pyralin finish, white, black and colors and in glass white, black and crystal.

1-in. round bars are also furnished in pyralin and glass, otherwise as above mentioned.

Regular lengths center to center of posts are: 18, 24, 30, 36, 42 and 48 in., the last two having also a center post. Other lengths to order.

See illustrations page 7, all of substantially same design but with different wall attachments and having designating numbers. Specifications should include quantity, plate number and type, length and color, thus: 24—F-300 non-slip pyralin bars, 18 in. long white, or 12—F-600 round glass bars 30 in. long crystal.

No. F-300—Dowel back type.
No. F-430—Clincher back type, 6x3 back.
No. F-530—Clincher back type, 4 1/4x4 1/4 back.
No. F-600—Clincher back type, 3x3 back.
No. F-307—Dowel back type has two 5/8-in. square bars, pyralin finish only, and in the same regular lengths up to 36 in.

Fairfacts Glass Shelves with China Brackets—See Pages 5, 6 and 7.

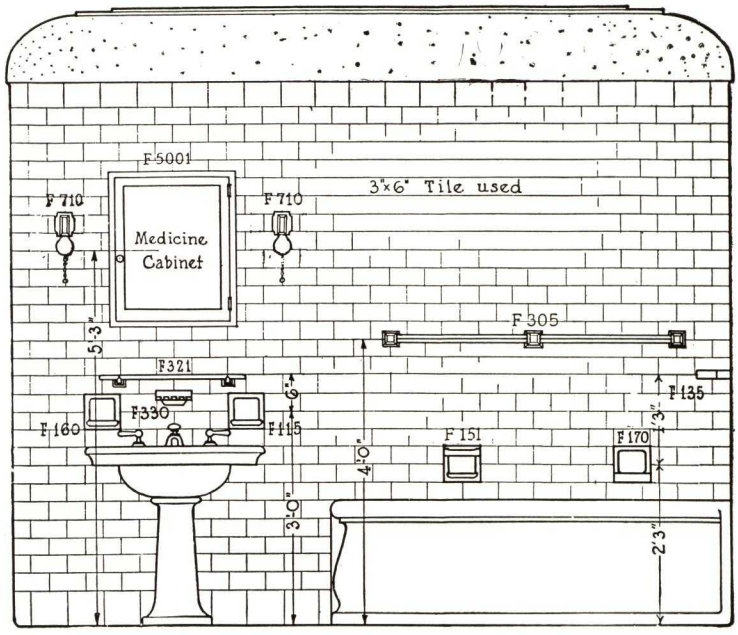
Glass can be furnished in white, black and crystal.

Shelves are 5 in. wide. Those with serial number ending in 0 rest on the brackets. Those with serial number ending in 5 are bolted to brackets.

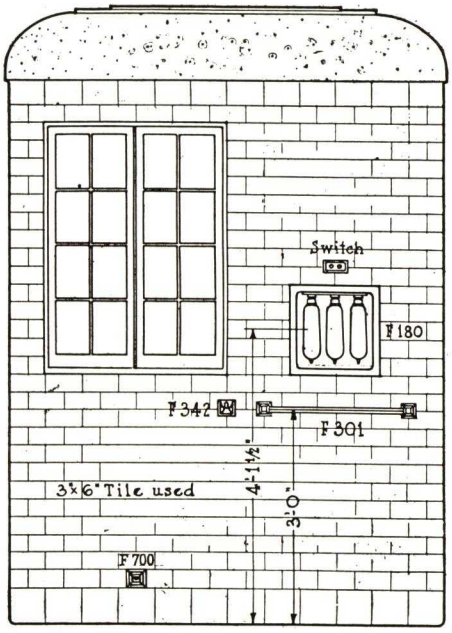
Length, in.	Dowel back type	Clincher back type		
	F-320	6x3	4 1/4x4 1/4	3x3
18, 24, 30, 36	F-324	F-460	F-560	F-620
20, 24, 30, 36	F-325	F-465	F-565	F-625

Note: F-324 is like F-320, except that shelf is held in place by metal clamps and set screws at back of shelf.

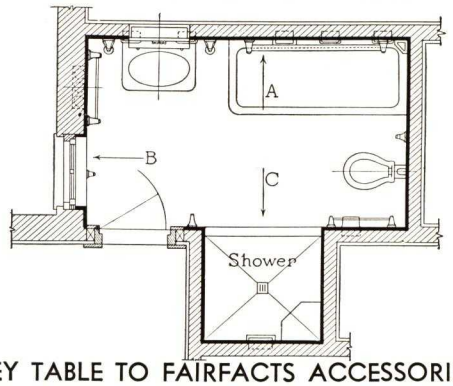
TYPICAL BATHROOM SHOWING FAIRFACTS ACCESSORIES



ELEVATION "A"

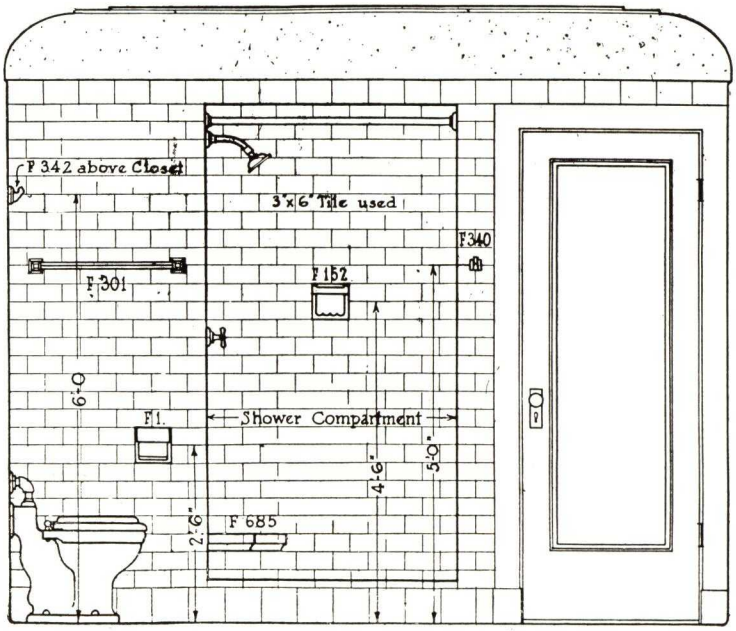


ELEVATION "B"



KEY TABLE TO FAIRFACTS ACCESSORIES

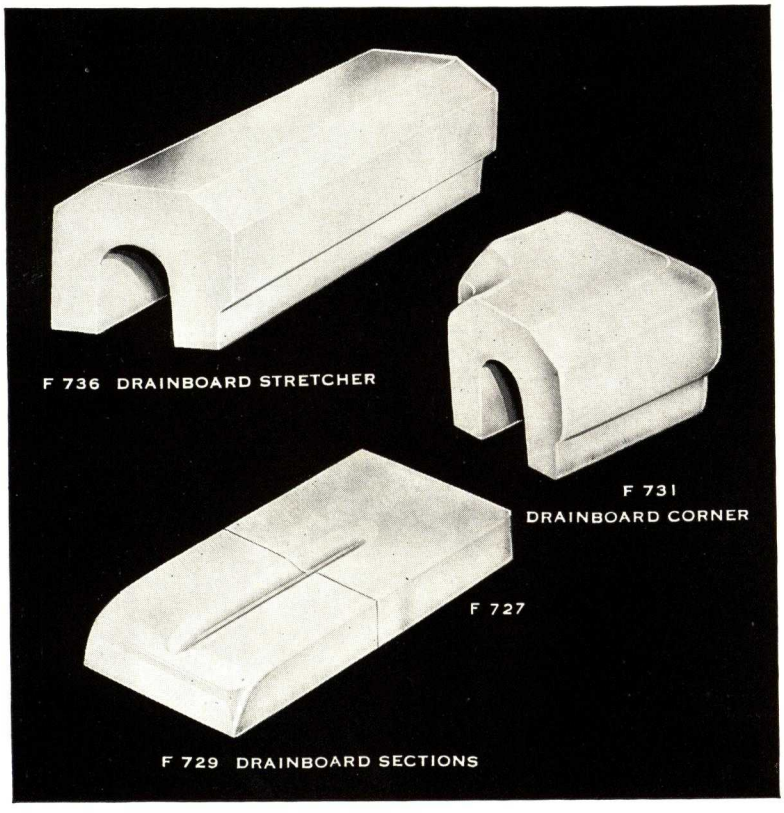
Cat. No.	Article
F-1	Biltin China Roll Paper Holder
F-115	Biltin China Soap Holder
F-135	China Soap, Sponge or Brush Holder
F-151	Biltin China Combination Soap Holder and Wall Grip
F-152	Biltin China Combination Soap Holder and Wall Grip
F-160	Biltin China Tumbler Holder
F-170	Biltin China Sponge Holder
F-180	Biltin China Electric Bathroom Radiator
F-301	Nonslip Towel Bar with China Posts (24 in. long)
F-305	Nonslip Towel Bar with China Posts (48 in. long)
F-321	White Glass Shelf with China Brackets (24 in. long)
F-330	China Tooth Brush Holder
F-340	China Hook for Robes, etc. (4 1/2 in. long)
F-342	China Hook for Strop, Douche, etc. (2 in. long)
F-685	China Bathroom Seat
F-700	China Stop
F-710	China Light Fixture
F-5001	Medicine Cabinet



ELEVATION "C"

"Royal Line" Fixtures of Same Type Take Same Locations

Installation Showing Complete Drainboard built with Fairfacts Sink Trim (Black) and Fairfacts Drainboard Sections (White).



FAIRFACTS

SINK TRIM AND DRAINBOARD SECTIONS

Suggestion for Kitchen and Pantry Sinks
Modern — Attractive

The Drainboard illustrated above is a combination of Fairfacts Sink Trim and Drainboard Sections illustrated at left—for details see pages 12 and 13.

Fairfacts Sink Trim and Drainboard Sections are made of Vitreous China (the same material used in our china accessories). The Drainboard Sections are grooved to drain water off drainboard into the sink. The Trim around the Drainboard (see F736) is attractive in design and extra heavy.

See pages 12 and 13 for details of Fairfacts Trim and Drainboard sections.

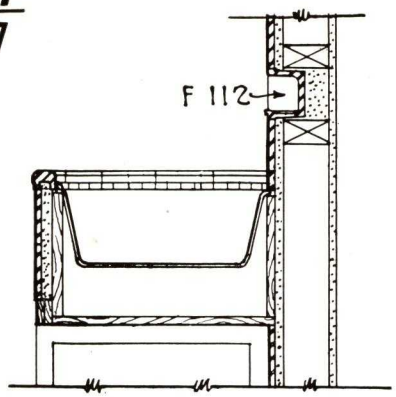
DETAILS OF FAIRFACTS SINK TRIM

NOTE

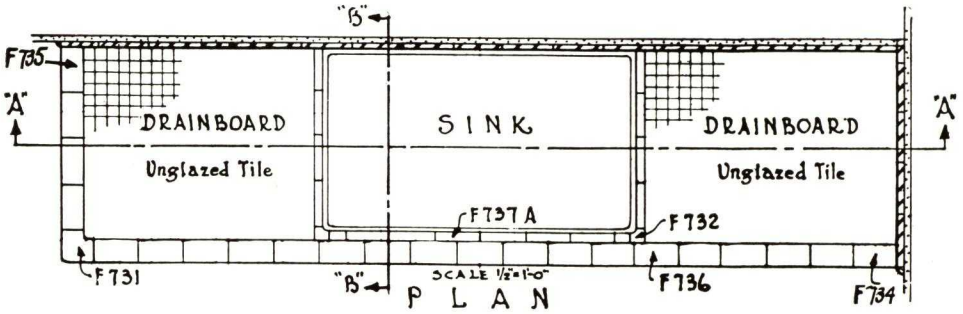
Solid Vitreous China Trim for Kitchen and Pantry Sinks and their Drainboards. Can be used for swimming pools.

BEAUTIFUL NEW DESIGNS

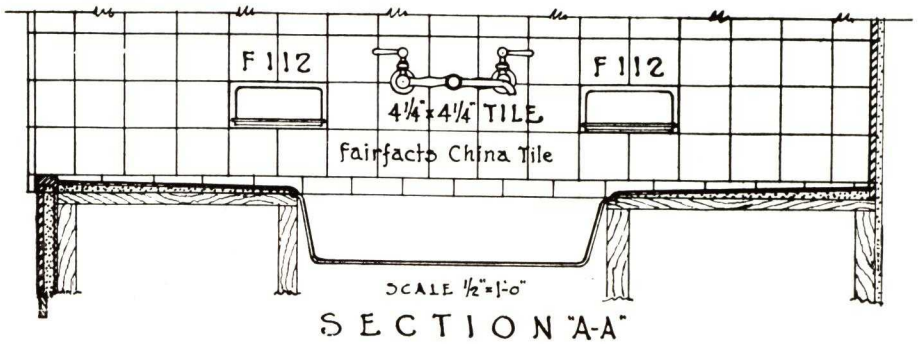
White, Black, Colors



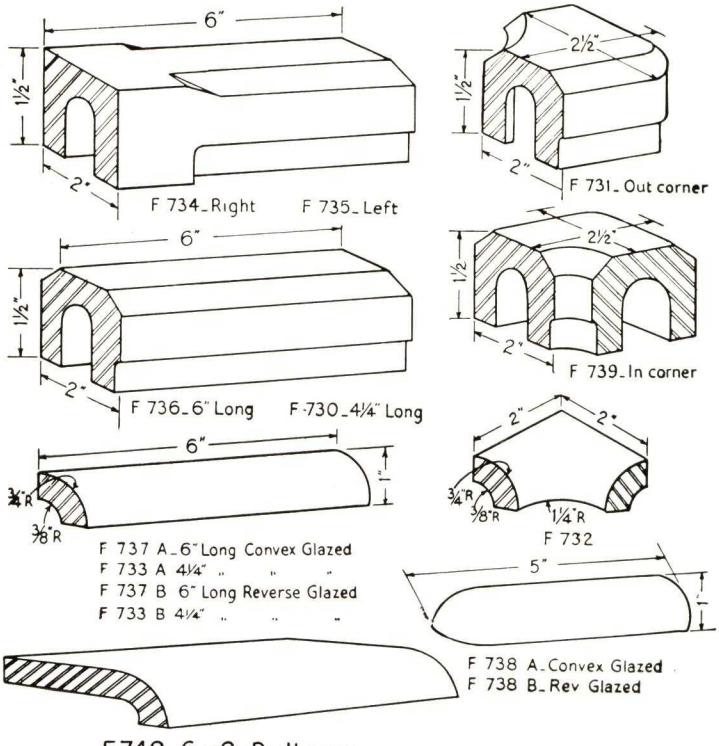
SECTION B-B
SCALE 1½"=1'-0"

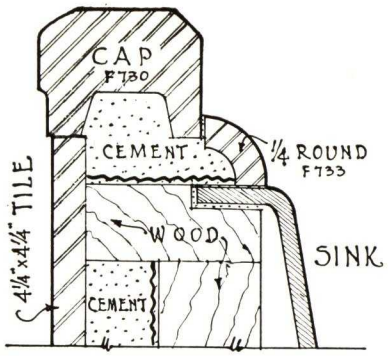


SCALE 1½"=1'-0"
PLAN

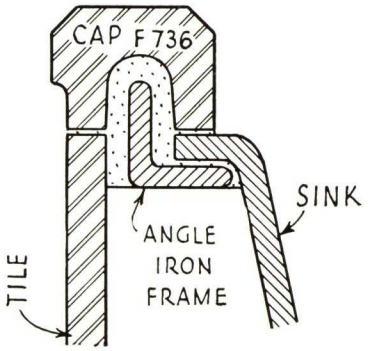


SCALE ½"=1'-0"
SECTION "A-A"



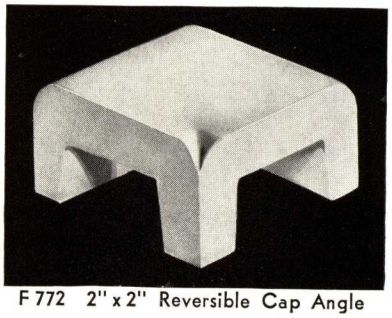


DETAIL OF SINK FRONT
SCALE 3"=1'-0"

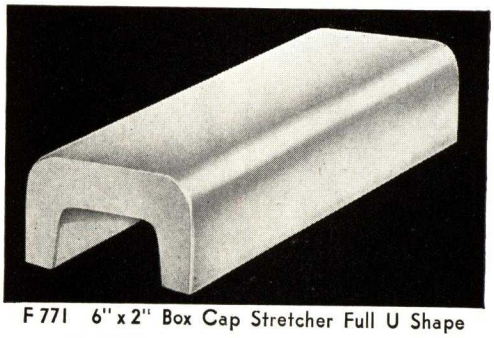


DETAIL ALONG FRONT OF SINK
WHEN F-749 BULLNOSE IS USED AT SINK ENDS OF DRAINBOARDS

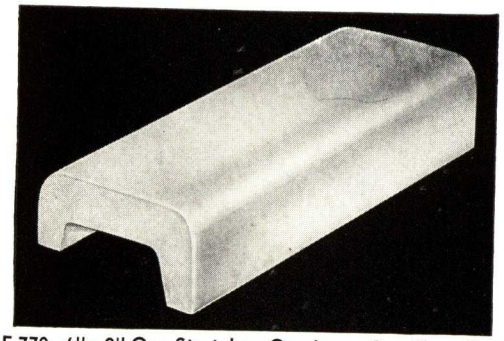
PLAIN COMPETITIVE TYPE SOLID VITREOUS CHINA SINK TRIM



F 772 2" x 2" Reversible Cap Angle



F 771 6" x 2" Box Cap Stretcher Full U Shape



F 770 6" x 2" Cap Stretcher, One Long, One Short Side

DETAILS OF FAIRFACTS DRAINBOARDS

SOLID VITREOUS CHINA DRAINBOARDS FOR KITCHEN AND PANTRY SINKS

Grooved to drain water into the sink
Withstand hard usage
Water spots hardly noticeable, no discoloration

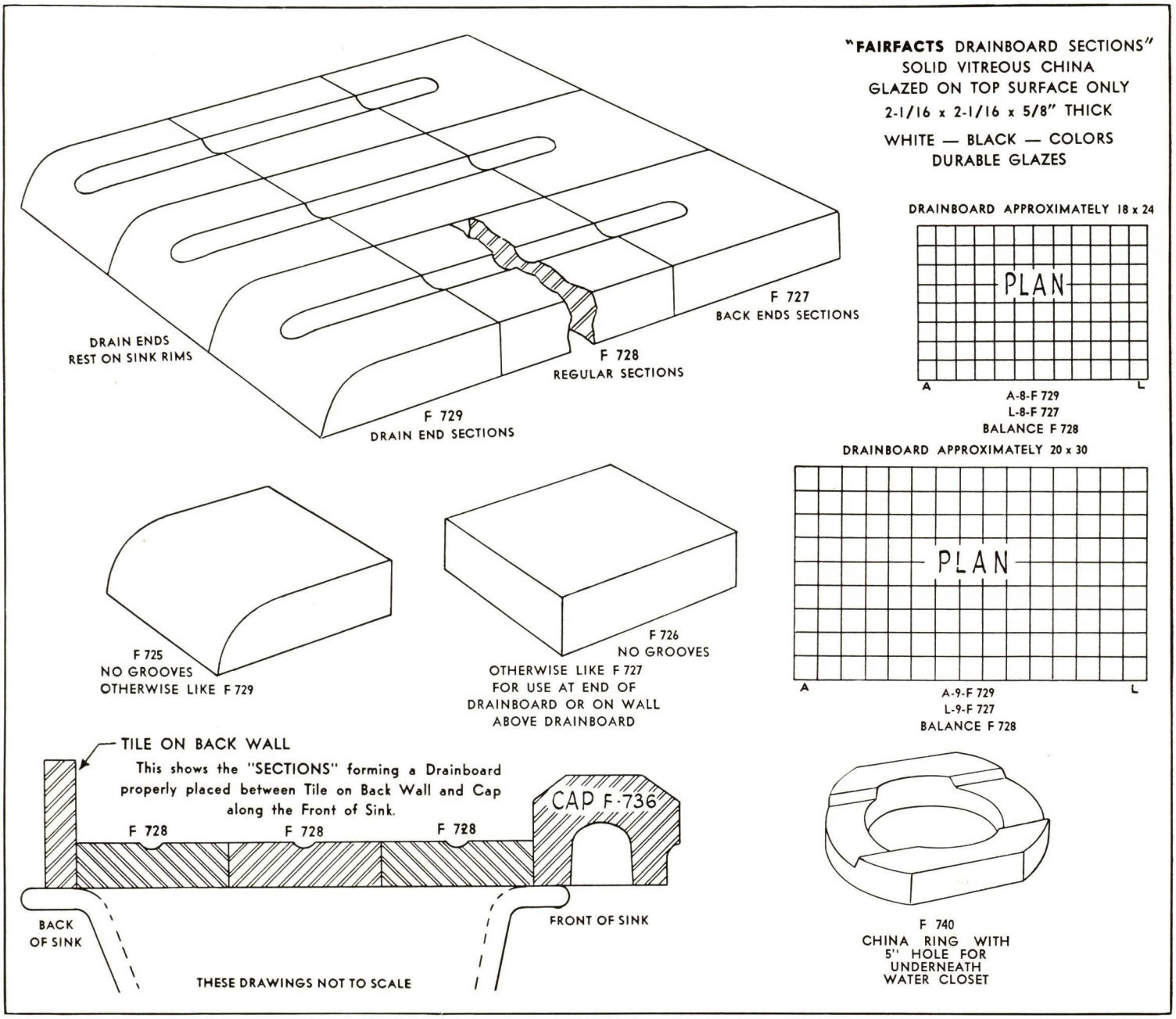
Hard vitreous glazed top surface
Does not absorb dirt or grease
Easy to clean, no polishing, no deterioration
Lasts a lifetime

These Drainboard Sections when combined with Fairfacts Solid Vitreous China Sink Trim produce very beautiful and durable drainboards.

Everything solid china except the sink. No drainboard size limitation as with factory built sinks. Sink and drainboard can be fitted to the room instead of the room to the drainboard.

Fairfacts Drainboard Sections — the New Drainboard Material is available in White or Black or colors for solid and for many color combinations.

(Sold, Built and Installed by the Tile Contractor)



"SAMSONCHINA"

BATH ROOM ACCESSORIES

•

FASTEN TO THE WALL WITH SCREWS

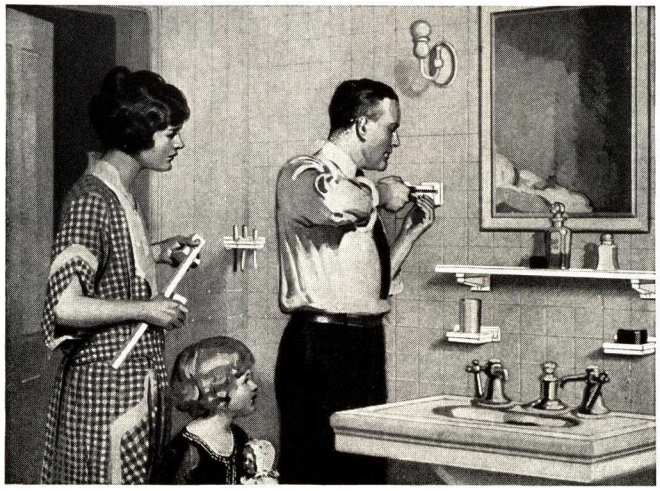
•

CHINA CAPS COVER AND MAKE THE SCREW HEADS INVISIBLE

There are certain principles that are based upon a foundation of **rightness.** They are the principles that endure. One of these principles, as applied to bathroom fixtures, is that the fixtures must have a beauty and harmony of construction and design.

The most important aspect of this principle is that bathroom fixtures should be **sanitary!** They must be made of a substance unpollutable, easily cleaned. They should be **durable**—of materials that will not wear out. They should match or **harmonize** with the bigger fixtures of the room.

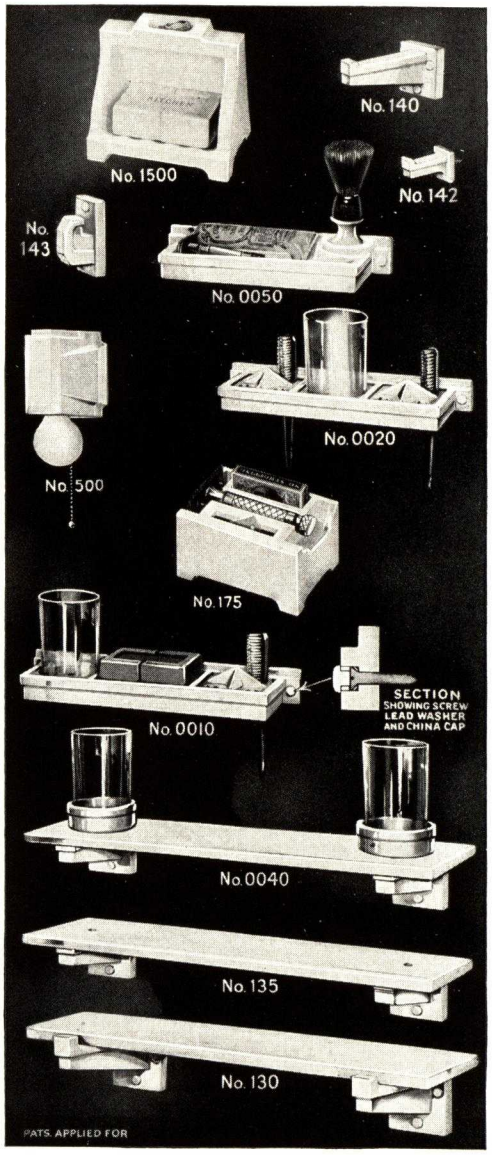
"Samsonchina" Fixtures obey all these conditions. They are made of china, pure, snow-white china of the strongest kind, also black and colors. In construction they match your wash-basin, your tub, your toilet-bowl. In appearance they, too, are sanitary, easy to clean. In design they are made on beautiful lines of suggested solidity and of definite harmony. They are like a fine set of dinner china, they match.



EASY TO PUT UP

"Samsonchina" Bathroom Fixtures are easily installed. They go on any type of wall where metal fixtures might be used. This includes walls of tile, cement, marble, plaster or wood.

They are put up with screws, exactly like other bathroom fixtures, the screw heads being covered by tiny china caps which a dab of plaster of paris (packed in each carton) fastens in place.



"SAMSONCHINA"

SIZES OF PIECES (Overall In Inches)

Arranged—Width, Height, Depth

SINGLE HOLDERS

No.		Sizes
1	Soap	5¾x1⅜x3⅜
2	Soap, Large	10⅞x1⅜x4
10	Tumbler	4½x1⅜x3⅜
20	Tooth Brush	4⅝x1⅜x3⅜
30	Sponge	7⅝x3⅜x5½
160	Small Tray	8⅞x1⅜x3⅝
165	Large Tray	10⅞x1⅜x4
170	For Used Razor Blades	3⅜x3x1¾
190	Grab Rail	7½x3½x3
500	Light Fixture	4x4x2⅞

CORNER TYPE HOLDERS

No.		Sizes
40	Soap	4⅜x1¾x4⅜
50	Tumbler	4x1¾x4⅛
60	Tooth Brush	4x1¾x4⅛
70	Sponge	5½x3⅞x6¼

HOOKS

No.		Sizes
140	Towel	2¼x2¼x5
142	Robe	1⅛x1½x2¼
143	Strop	1⅛x3⅛x1⅞

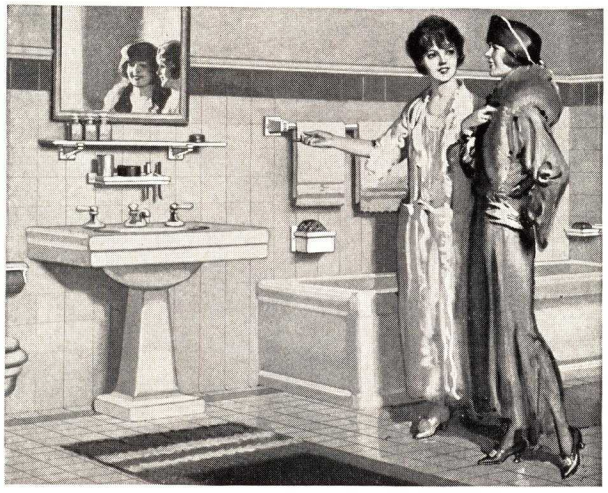
COMBINATION HOLDERS

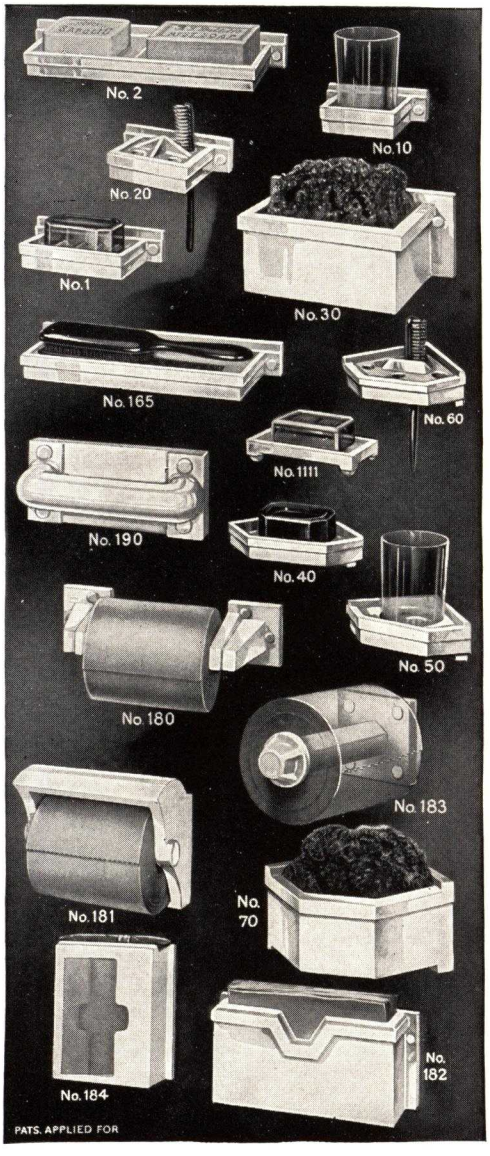
No.		Sizes
01	Double Soap	10x1⅜x3⅜
010	Soap & Tumbler	8¾x1⅜x3⅜
020	Soap & Tooth Brush	8¼x1⅜x3⅜
030	Double Tumblers	8½x1⅜x3⅜
040	Tumbler & Tooth Brush	7⅝x1⅜x3⅜
050	Tooth Brush & Paste	7¼x1⅜x3⅜
060	Soap & Cleanser	10⅞x1⅜x4
195	Grab Rail & Soap	7⅜x3⅞x3⅝
0010	Soap Tumbler & Tooth Brush	11⅞x1⅜x3⅜
0020	Tumbler & Double Tooth Brush	10¾x1⅜x3⅜
0050	Shaving Set	9x1⅜x3¾

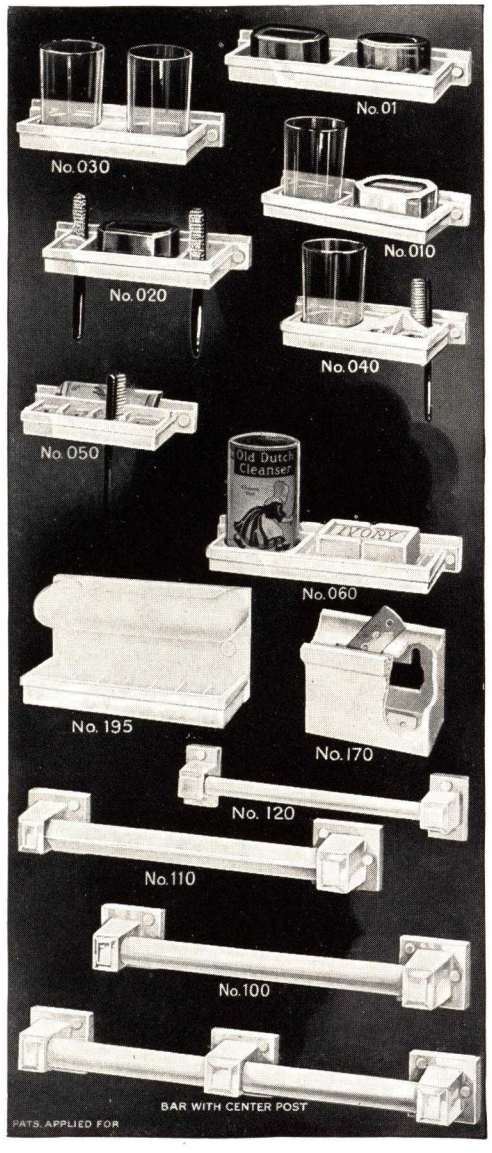
PAPER HOLDERS

No.		Sizes
180	For Roll Paper	9⅜x2¾x4
181	For Roll Paper	6½x5½x4¾
182	For Sheet Paper	9x4x2¾
183	(Post) for Roll Paper	3x3x6⅝
184	For Folded Sheet Paper	4¾x5¾x2⅜

(181 Holds Roll of 1000 Sheets only)







PORTABLE HOLDERS

No.		Sizes
1111	Portable Soap	4½x¾x3
175	Cabinet, White China, for Razor & New & Old Blades	3⅝x2⅛x2⅜
176	Cabinet, Colored China, for Razor & New & Old Blades	4x2x2¼
1500	Portable Soap with Ring Cup	5½x4¾x3⅜

TOWEL BARS

No.		Over-all Length 20½	26½	32½	38½	44½	50½
100	1" Round White Glass						
101	1" Round Celluloid						
110	⅞" Square Celluloid						
	Can Supply No. 110 with ⅞" Square Glass Bar						
121	⅝" Round Celluloid				19½"		25½"

SHELVES

White Glass, 5" Wide with China Posts

No.		Lengths 20"	24"	30"
130				
135	Shelves Bolted on			
0040	With Tumbler Holders			

Wood Screws or Bolts with Lead Washers, China Caps and Plaster Paris are furnished with all pieces needing them.

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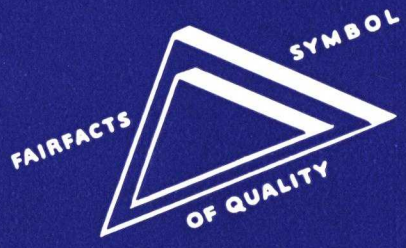
Fairfacts

VITREOUS CHINA LINE
"CHINACHROME" LINE

BATHROOM ACCESSORIES



The Fairfacts Company
INCORPORATED
234 WEST FOURTEENTH ST.
NEW YORK, U.S.A.

CABLE ADDRESS
"FAIRFACTS"
CODE ABC. 6TH EDITION
AND BENTLEY'S

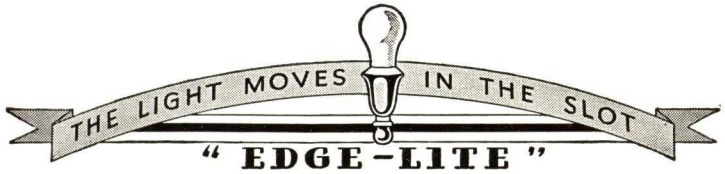
PLANT
FAIRFACTS ST.
TRENTON, N.J.

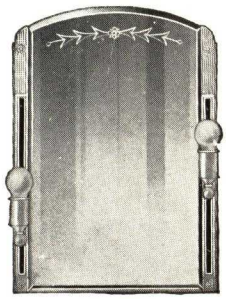
CATALOGUE No. 38

FARIES MANUFACTURING CO.

"Edge-Lite" Bathroom Cabinets, Mirrors and Vanities

DECATUR, ILL.





No. 130

Graceful, etched, beveled, plate glass mirror. Mirror frame has die-cast sides. Heavy gauge steel cabinet with 2 bulb-edge glass shelves. Chrome plated light fixtures slide up or down both sides. Finish: Black Enamel door with White Enamel cabinet. Chrome door, add $3.00 list.

Mirror size incl. door frame	18½"x24"
Inside box dimension	14¼"x17½"x4½"
Wall opening required	14½"x17¾"x3¾"
Black enamel door and white box	$26.50
Chrome door and white box	29.50

Has 1-in. return flange. 3-in. depth optional without extra cost.

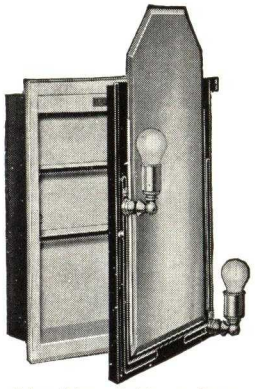
Edge-Lite Features

(1) Light where wanted; shadowless light for shaving or make-up, or perfect room illumination.

(2) To install, slide complete unit into wall opening; fasten with 4 screws; connect to house wires.

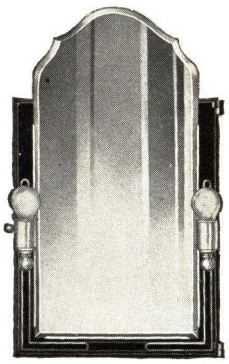
(3) Substantial die cast door cannot sag. Steel enclosed back.

(4) Heavy gauge, steel cabinet electrically welded. Heavy glass shelves with rolled (bulb) edges to prevent chipping and to eliminate articles rolling off.



Edge-Lite Cabinet Open

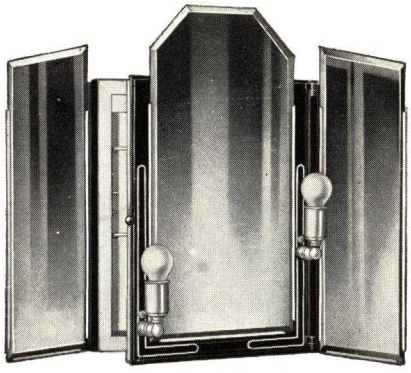
All models fully approved by National Board of Fire Underwriters



No. 222-232

Beautiful period cabinet; spacious; removable shelves. Die-cast door frame. Heavy gauge steel cabinet with 2 bulb-edge glass shelves. Chrome plated light fixtures slide up—down—across. Wired. Optional finishes: All Orchid, All Green. For Chrome door, add $5.00 list.

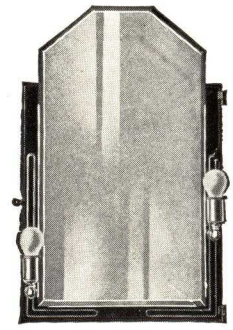
Style	No. 222	No. 232
Mirror size incl. frame	16½"x27½"	19¼"x29½"
Inside box	14" x18" x4½"	17" x20" x4½"
Wall opening	14½"x18½"x4¾"	17½"x20½"x4¾"
Standard finishes	$34.00	$43.50



No. 113

Comes in two sizes. Moderne mirrors as shown or Villa Venice mirrors optional. Has die-cast door frame with Chrome plated light fixtures; sliding up—down—or across. Cabinet back of center mirror. Heavy gauge cabinet with 2 bulb-edge glass shelves. Wired. Finishes: Black door frame with white cabinet, All Orchid or All Green. Chrome door, add $8.00 list.

Style	Moderne Mirrors	
	No. 113	No. 127
	Villa Venice Mirrors	
	No.128	No. 129
Over all	36½"x25¾"	30¼"x29½"
Inside box	14" x18" x4½"	17" x20" x4½"
Wall opening	14½"x18½"x4¾"	17½"x20½"x4¾"
Standard finishes	$61.00	$73.50



No. 142-152

Cabinet similar to No. 222-232. Finishes: Black Enamel door with Ivory Enamel cabinet, or All Orchid, or Ming Green door and Green cabinet. Chrome door, add $5.00 list.

Style	No. 142	No. 152
Mirror size incl. frame	16½"x25½"	19½"x29½"
Inside box dimension	14" x18" x4½"	17" x20" x4½"
Wall opening required	14¾"x18½"x4¾"	17½"x20½"x4¾"
Standard finishes	$34.00	$43.50

Edge-Lite Features

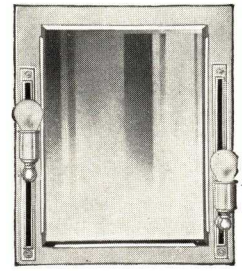
(5) High quality, selected plate glass mirrors, beveled edge. Two silverings, copper sealed, non-electrolytic paint cover coat. Mirrors guaranteed.

(6) Heavy metal door opener and secure catch.

(7) Highest quality chrome and enamel finishes on all models.

(8) All cabinets available with convenience outlets. $2.50 list extra.

(9) All cabinets can have special finish to match tile at $3.00 list extra.



No. 110

A moderately priced cabinet with beveled plate glass mirror. Door frame has cast mirror slides. Heavy gauge steel box with 2 bulb-edge glass shelves. Chrome plated light fixtures, slide in channel up—down both sides. Wired. Finishes: White Enamel door with White Enamel cabinet, or All Ivory.

Mirror size incl. door frame	18¼"x21"
Inside box dimension	14¼"x17½"x4½"
Wall opening required	14½"x17¾"x3¾"
Standard finishes	$21.50

FRIES AND SON STEEL CONSTRUCTION AND ENGINEERING CO.

Manufacturers of Corcoran One-piece Steel Bathroom Cabinets and Empire Steel Bathroom Cabinets

(Patented)

COVINGTON, KY.

For Cells, for Jails, Prisons, etc., see File Index

DISTINCTIVE FEATURES OF CORCORAN ONE-PIECE STEEL BATHROOM CABINETS

No Cracks—No Seams—No Welded Joints—No Raw Edges

(1) Entire cabinet body and flange drawn from one integral piece of steel. Patented design.

(2) Round corners—inside and outside—easy to clean and keep clean, conforming with balance of bathroom fixtures.

(3) Continuous piano type door hinge of brass—heavily nickelplated. Prevents door from sagging or warping.

(4) Three heavy bulb edge glass shelves notched in ends to prevent slipping—yet easily removed.

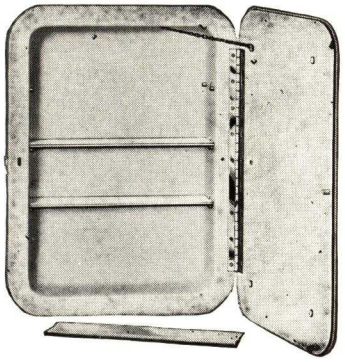
(5) Highly nickelplated shelf supports of interlocking construction. This is a patented feature.

(6) *New automatic door opener.* Press nickelplated opener on return flange and door opens. Positive in action. Latest improvement —an exclusive Corcoran feature.

(7) *The brass spring plunger* acting in conjunction with door fastener also serves as cushion when closing door, thus preventing mirror breakage.

(8) Nickelplated combination chain with heavy spring door stop.

(9) Four nickelplated bolts and nuts for fastening mirrors to doors.



(10) All Corcoran Cabinets are *Bonderized.* The Bonderite coating is an integral part of the metal and is sufficiently absorbent to provide a permanent bond with the applied finish so that it will not crack, flake or peel off. Bonderizing lengthens the life of the finish and preserves its fine appearance. It helps maintain the Corcoran Snow White Finish indefinitely.

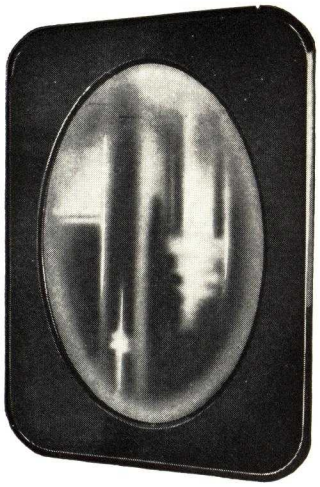
(11) Finished with pyroxylyn lacquer. The prime coat is baked on at a temperature of 360°. No cheap enamels used.

(12) Mirrors are guaranteed against defective silvering and poor workmanship. All mirrors are copper backed.

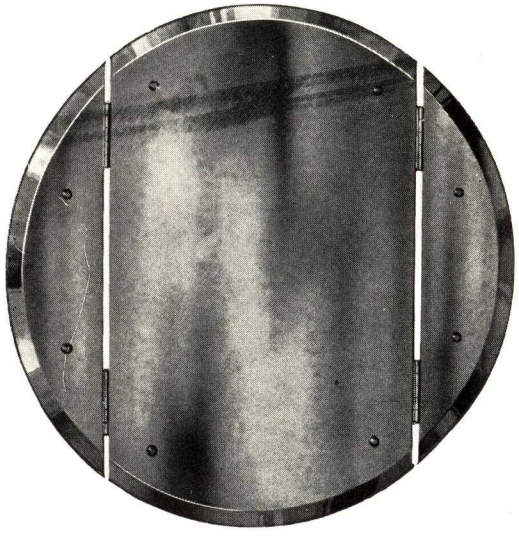
SPECIFICATIONS—BODY SIZES

	16 x 22 body	*18 x 24 body*	*21 x 27 body*
Outside dimensions	16 x 22 in.	18 x 24 in.	21 x 27 in.
Inside dimensions	13 x 19 x 4 in.	15 x 21 x 4 in.	18 x 24 x 4 in.
Wall opening	13¼ x 19¼ x 3¼ in.	15¼ x 21¼ x 3¼ in.	18¼ x 24¼ x 3¼ in.
Width of front flange	1½ in.	1½ in.	1½ in.
Depth of return flange	1 in.	1 in.	1 in.
Shelves furnished	3	3	3

TYPICAL MODELS OF CORCORAN CABINETS



Carrolynn



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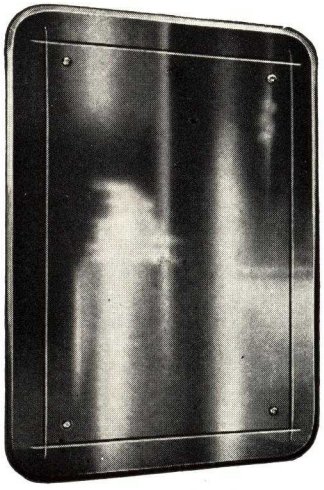


No. 1622-M

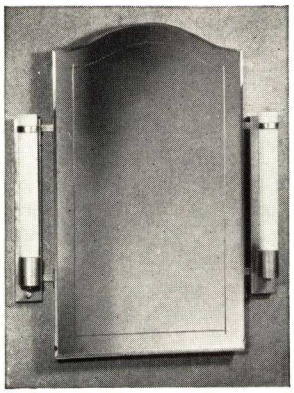
Corcoran Cabinets are sold and available throughout the United States and Canada. Complete information, together with catalogue, as to your nearest jobber or dealer sent immediately upon request.

190T

HESS WARMING & VENTILATING CO.

Hess Mirrored Bathroom Cabinets and Lavatory Mirrors

1211 South Western Avenue, CHICAGO, ILL.



L-1830 Tube-O-Lite Cabinet

HESS TUBE-O-LITE CABINETS

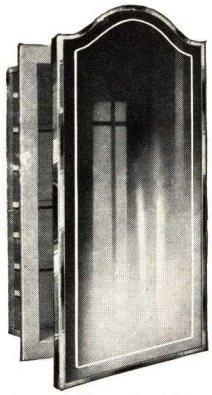
Standard tubular Mazda lamps inside the tubes produce a long source of light from both sides of the cabinet. Lights may also be turned to a soft glow for night light. The tubes produce an abundance of light, sufficient for bathrooms of ordinary size without additional lighting facilities.

Venetian "Seal-Bak" Mirror, guaranteed against discoloration may be plain or miter line decoration at customer's option. Cabinet comes completely wired with switch, ready to install and connect. Lamps are not included but may be obtained from any lamp supply house. Use Mazda No. T-8 40 watts.

Telegraph code word	No.	Type	Frame	Mirror, size, in.	Weight, lb.	Wall opening,
Snaplite	L-1828	Simplicity	None	18x27½	50	15x24x4¼
Fraslite	LF-828	Simplicity	Framed	18x27½	52	15x24x4¼
Snolite	L-2030	Simplicity	None	20x30	60	17x26x4¼
Frostlite	LF-2030	Simplicity	Framed	20x30	62	17x26x4¼
Valite	L-1830	Venetian	None	18x30	55	15x24x4¼
Verblite	LF-1830	Venetian	Framed	18x30	58	15x24x4¼
Viewlite	L-2032	Venetian	None	20x32	65	17x26x4¼
Fralite	LF-2032	Venetian	Framed	20x32	70	17x26x4¼

Depth of return flange—¾ in. Number of shelves—three, plus extra plate for bottom. Miter line decoration will be supplied with Venetian Tube-O-Lite cabinets unless otherwise ordered.

All Tube-O-Lite Cabinets are approved and labeled by Underwriters' Laboratories, Inc.



Framed Venetian Miter Line Decoration

HESS FRAMED VENETIAN AND SIMPLICITY CABINETS

Mirrors—Exceptionally high grade selected plate glass. Silvering is Seal-Bak protected, guaranteed against discoloration.

Doors—Doors are $\frac{13}{32}$ in. thick and have channel section brass chromium plated frames with $\frac{7}{16}$-in. face. Curved tops of frames on Venetian doors are die formed without distortion of surface. Backs of doors are steel finished in white baked enamel like cabinet. A fiber pad or cushion is placed between mirror and the back. Door latch is polished stainless steel.

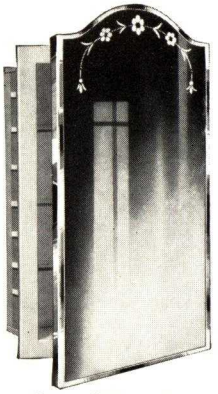
Cabinets—Cabinet and door back are made of cold rolled furniture steel. Cabinet is formed from one piece of steel, and is smooth inside, no seams or raw edges to catch dirt. Cabinet may be set and fastened in the recess before the door is hung.

Finish—White porcelain-like baked enamel. Proof against soap, alcohol and all solvents usually found in household medicinal preparations.

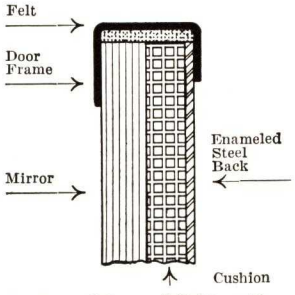
Shelves—Bulb edge glass, adjustable, with plate glass bottom shelf.

Door Stops—Doors are provided with chromium beaded chain door stops. Chain stops are noiseless, and do not interfere with bottles on top shelf as do solid bar stops.

Design—Hess framed cabinets set close to wall. Total projection including the door is only *one inch.*



Framed Venetian Etched Decoration



Section of Framed Cabinet Door with Framed Lavatory Mirror

FRAMED VENETIAN CABINETS

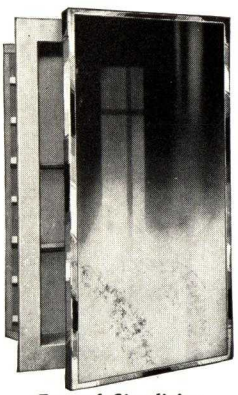
Code word	No.	Mirror size, in.	Wall opening, in.	Return flange, in.	Over-all size, in.	No. of shelves	Ship. wgt.
Fravote	F-1624	16x24	13x19x3 7/8	⅜	15⅝x21⅝	2	33
Fravale	F-1826	18x26	15x21x3 7/8	⅜	17⅝x23⅝	3	42
Fraverb	F-1830	18x30	15x24x3 7/8	⅜	17⅝x26⅝	3	46
Fraview	F-2032	20x32	17x26x3 7/8	⅜	19⅝x28⅝	3	61

FRAMED SIMPLICITY CABINETS

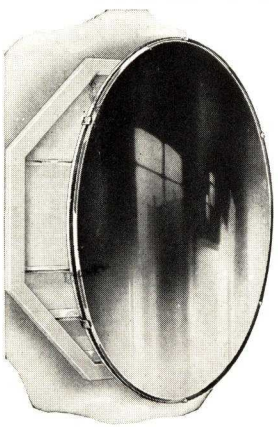
Frasnug	F-622	16x22	13x19x3 7/8	⅜	15⅝x21⅝	2	30
Fraswan	F-824	18x24	15x21x3 7/8	⅜	17⅝x23⅝	3	39
Frasnap	F-828	18x27½	15x24x3 7/8	⅜	17⅝x26⅝	3	43
Frasnow	F-2030	20x30	17x26x3 7/8	⅜	19⅝x28⅝	3	58

An extra plate glass is furnished for bottom of cabinet.

Framed Simplicity cabinets may be had with mirrors having polished miter line decoration at small additional charge.



Framed Simplicity



Caprice Cabinet

Caprice Mirrored Cabinet

Ideal for the most modern bathroom or powder room. The circular Seal-Bak mirror is supported by tiny stainless steel clips. Cabinet is in the form of an octagon to give greater shelf space.

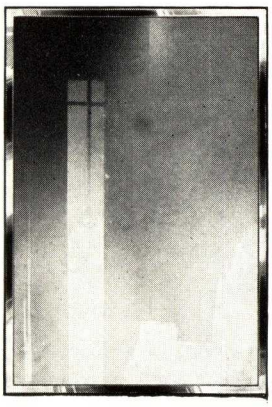
Mirror—selected plate glass—circle, 24-in. diameter. Wall opening—octagonal, 20 in. between sides. Depth of return or body flange—⅞-in. Three glass shelves and one flat shelf, plate thickness.

Lavatory Mirrors

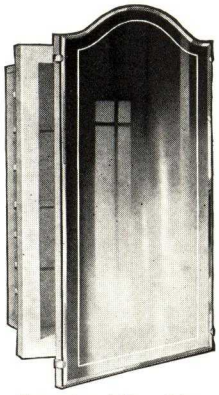
Mirrors have brass channel section, chromium plated frames with galvanized steel backs and concealed key hole slots for hanging either way. Mirror silvering is Seal-Bak protected, guaranteed against discoloration.

Code word	Number	Mirror size, in.	Weight, lbs.
Serf	121	12x18	12
Slat	142	14x20	14
Spot	162	16x22	18
Spud	172	18x24	22
Strut	182	18x27½	28

Caprice Circular Lavatory Mirror—A 24-in. circular plate glass beveled edge mirror attached to enameled steel back by stainless steel clips. Attaches to wall with concealed key hole slot hangers.



HESS VENETIAN AND SIMPLICITY CABINETS



Venetian Miter Line Decoration

Mirrors—Exceptionally high grade plate glass, carefully selected to eliminate defects. Beveled edges; silvering is Seal-Bak protected.

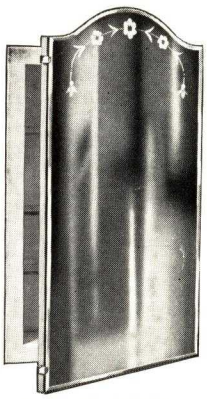
Doors—One-half inch thick, containing insulating fiber pad or cushion which protects mirror and eliminates any rattle or metallic sound. Mirror clips and door latch are polished stainless steel.

Cabinets—Cabinet and door are made of cold rolled steel. The cabinet is formed from one piece of steel, and is smooth inside, no seams or raw edges to catch dirt. The cabinet box may be set and fastened in the recess before the door is hung. This saves time in installing cabinets.

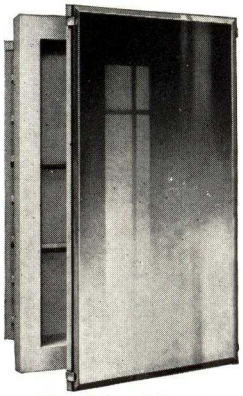
Finish—White porcelain-like baked enamel. Proof against soap, alcohol and all solvents usually found in household medicinal preparations.

Shelves—Bulb edge glass, adjustable.

Door Stops—Plated brass spring chain door stops. Chain stops are noiseless, and do not interfere with bottles on top shelf as do solid bar stops.



Venetian Etched Decoration



Simplicity Cabinet

VENETIAN CABINETS

Telegraph code word	No.	Mirror size, in.	Wall opening, in.	Depth of return or body flange, in.	Overall size of cabinet, in.	No. of shelves	Weight, lbs.
Vote	1624	16x24	13x19x3½	¾	15⅝x21⅝	2	30
Vale	1826	18x26	15x21x3½	¾	17⅝x23⅝	3	37
Value	1830	18x30	15x24x4¼	¾	17⅝x26⅝	3	42
View	2032	20x32	17x26x4¼	¾	19⅝x28⅝	3	55

Mirrors with etched decoration, with miter line decoration, or with no decoration whatever are optional on Venetian cabinets. Mirrors with etched decoration will be supplied on Venetian cabinets unless otherwise ordered.

SIMPLICITY CABINETS

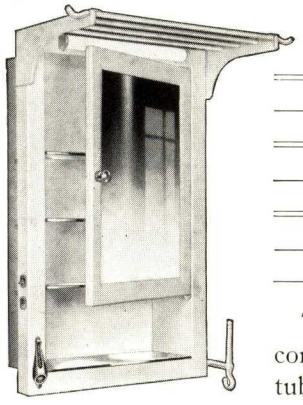
Telegraph code word	No.	Mirror size, in.	Wall opening, in.	Depth of return or body flange, in.	Overall size of cabinet, in.	No. of shelves	Weight, lbs.
Snug	1622	16x22	13x19x3½	¾	15⅝x21⅝	2	28
Swan	1824	18x24	15x21x3½	¾	17⅝x23⅝	3	34
Snap	1828	18x27½	15x24x4¼	¾	17⅝x26⅝	3	40
Snow	2030	20x30	17x26x4¼	¾	19⅝x28⅝	3	50

Mirrors with polished miter line decoration can be supplied with simplicity cabinets at small extra cost.

HESS HOTEL CABINET

The growing demand for the soft lighting afforded with tubular lights has led us to incorporate the lumiline feature in our Hotel Model. This cabinet is a vast improvement over the conventionally lighted cabinet. The soft glow that emanates from the entire length of the tube makes this light adequate in itself for bathroom illumination. It is equipped with a switch and convenience outlet.

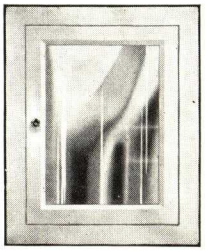
The towel rack and combination cork screw and bottle opener are among the several convenience fixtures which make this cabinet ideal for use in hotels and dormitories.



Code word	Depth of ret. flange, in.
Hotolite	1¼
Mirror, in.	**Number of shelves**
12 x 16	3
Wall opening, in.	**Weight, lbs.**
15 x 24 x 3½	38

This cabinet is also available with the conventional light fixture in place of the tubular light.

STYLE R AND S RECESS CABINETS



Style R

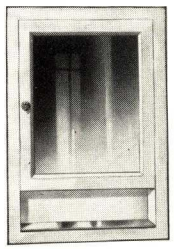
Mirrors—High grade plate glass; silvering is Seal-Bak protected. Plain mirrors are standard, but mirrors having beveled edges will be supplied at extra cost.

Doors—½ in. thick containing insulating fiber pad and swing on invisible pivot hinges.

Cabinets—Constructed of one piece cold rolled steel with no visible seams or raw edges to catch dirt.

Finish—White porcelain-like baked enamel, proof against soap, alcohol or other household medicinal preparations.

Pocket in Style S—This feature has many uses. The 5-in. pocket has a glass plate covering for the bottom.



Style S

STYLE R RECESS CABINET

Code word	No.	Outside dimension, in.	Wall opening, in.	Mirror size, in.	Number of shelves	Ship. weight
Rare	10	15⅝x19⅝	13x17x4¼	10x14	2	20 lbs.
Reach	12	17⅝x21⅝	15x19x4¼	12x16	2	25 lbs.
Rent	14	19⅝x23⅝	17x21x4¼	14x18	2	30 lbs.
Rack	16	21⅝x25⅝	19x23x4¼	16x20	3	34 lbs.

STYLE S RECESS CABINET

Code word	No.	Outside dimension, in.	Wall opening, in.	Mirror size, in.	Number of shelves	Ship. weight
Oak	100	15⅝x24⅝	13x22x4¼	10x14	3	23 lbs.
Oil	120	17⅝x26⅝	15x24x4¼	12x16	3	28 lbs.
Ohm	140	19⅝x28⅝	17x26x4¼	14x18	3	33 lbs.
Ore	160	21⅝x30⅝	19x28x4¼	16x20	4	39 lbs.

Hess Cabinets are now "Bonderized" by the Parker Rustproofing Process, before the finish is applied. "Bonderizing is the customer's assurance of the lasting fine appearance of Hess Cabinets.

MEMORANDA

HALL-MACK

Bathroom Accessories and Seamless Medicine Cabinets . . . .

HALLENSCHEID & McDONALD

FACTORY AND GENERAL OFFICES
LOS ANGELES • 1344 WEST WASHINGTON BOULEVARD

SAN FRANCISCO • 1159 HOWARD STREET CHICAGO • 743 N. WELLS STREET

TRADE HALL-MACK MARK "Aristocrome"

FORGED BRASS ACCESSORIES

MATERIAL and CONSTRUCTION

All Aristocrome pieces and parts are made of solid brass, polished to a mirror-like surface, nickel plated and then heavily chromium plated. Projecting pieces are forged from rod brass. The process produces a decidedly closer grained and denser metal than sand casting.

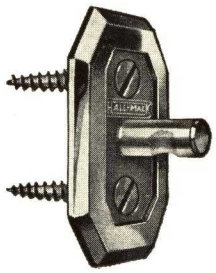
The denser metal takes a higher polish and gives a more brilliant and beautiful chromium finish than ordinary castings.

All recessed shells are drawn seamless from heavy rolled sheets of brass. The flange of all recessed pieces is integral with the body—eliminating all possibility of cracks opening between the flange and the body of the fixture.

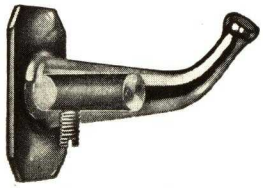
INSTALLATION OF PROJECTING ACCESSORIES

"S" TYPE • ATTACHED WITH SCREWS OR TOGGLE BOLTS

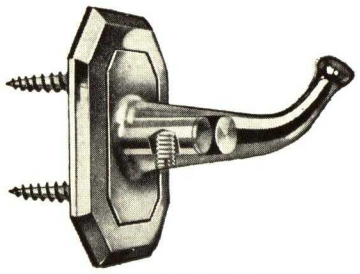
U. S. Patent No. 1,989,329



Base Plate



Projecting Part



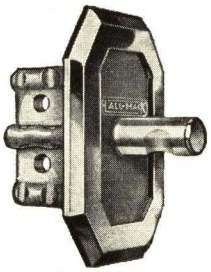
Complete Fixture

EXCLUSIVE FEATURES:

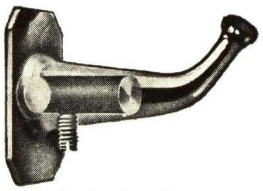
The base of the fixture is fastened directly and tightly to the wall. Its location can be accurately determined. It provides a large bearing surface against the wall. The projecting part is *locked to the base plate.* It does not depend for security upon pressure against a wall, but has a definite metal-to-metal lock against the base itself. The projecting part fits accurately into the patented recessed panel of the wall plate. This conceals the installing screws and prevents any possibility of sidewise movement.

"L" TYPE • INSTALLED BY SETTING IN CEMENT

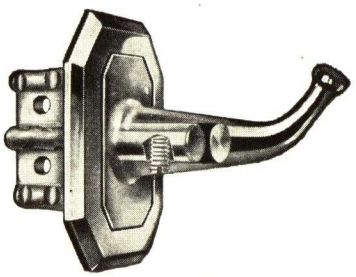
U. S. Patent No. 1,989,329



Base Plate



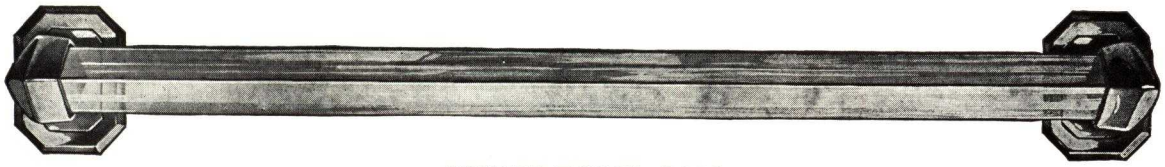
Projecting Part



Complete Fixture

EXCLUSIVE FEATURES:

The base of the fixture is integral with the cement lug. The lug is not screwed, soldered, or welded on, but is forged in one piece with the base plate. When the base plate is set the location and position of the fixture are accurately determined. This prevents the possibility of the fixture being crooked or out of line when it is assembled later. This is particularly important when installing in tile where the horizontal and perpendicular joint lines emphasize any untrueness of the fixtures. The projecting part is locked to the "L" base plate in exactly the same way as to the "S" plate. After installation the two types are identical in outward appearance.



SQUARE TOWEL BARS

No. 390: 7/8-in. Square Chromium Plated Bar

No. 391: 7/8-in. Square Crystal Glass Bar

No. 392: 7/8-in. Square Opal Glass Bar

No. 393: 7/8-in. Square Black Glass Bar

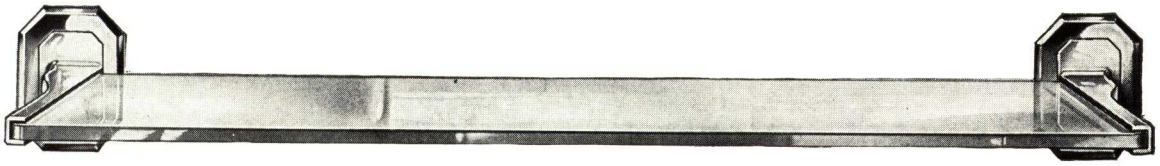
Standard lengths: 18, 24, 30, 36 in. Special lengths and center posts to order.

ROUND TOWEL BARS

No. 395: 3/4-in. Round Chromium Plated Bar

No. 396: 3/4-in. Round Crystal Glass Bar

Standard lengths: 18, 24, 30, 36 in. Special lengths and center posts to order.



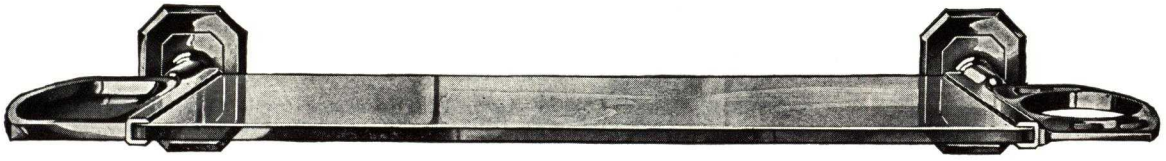
GLASS SHELVES

No. 301: 5-in. Wide Crystal Glass Shelf

No. 302: 5-in. Wide Opal Glass Shelf

No. 303: 5-in. Wide Black Glass Shelf

Standard lengths: 18, 24, 30 in. Special lengths to order.



GLASS SHELF COMBINATION

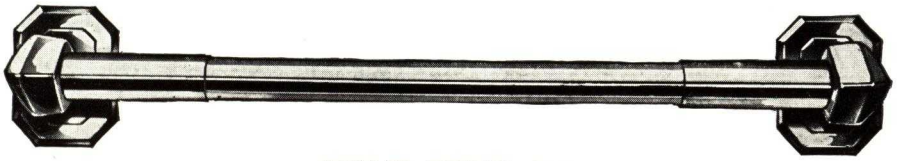
Shelf, Soap Holder, Tumbler and Toothbrush Holder in One Complete Inexpensive Unit

No. 311: 5-in. Wide Crystal Glass Shelf

No. 312: 5-in. Wide Opal Glass Shelf

No. 313: 5-in. Wide Black Glass Shelf

Standard lengths: 18, 24, 30 in. Special lengths to order.



ROLLER TOWEL BAR

For Paper Towel Rolls

No. 397: 3/4x12-in. Chromium Plated Roller

Any special length furnished to order.

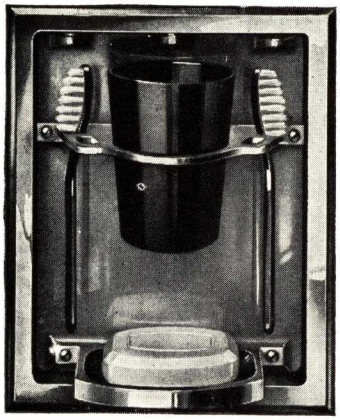
IMPORTANT: Accessories pictured above are made in two different types and, in ordering, it is necessary to specify the type desired. If fixtures are to be installed with screws or toggle bolts, add "S" to catalog number. If fixtures are to be installed by setting in cement, add "L" to catalog number.

TRADE HALL-MACK MARK "Aristocrome"

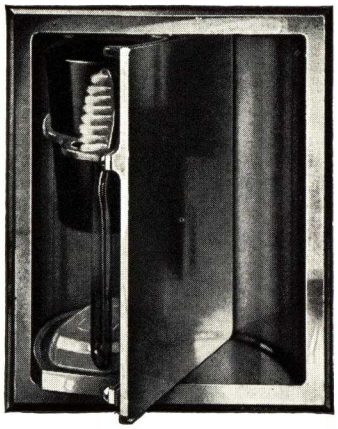
RECESS TYPE ACCESSORIES

CONCEALED LAVATORY UNIT

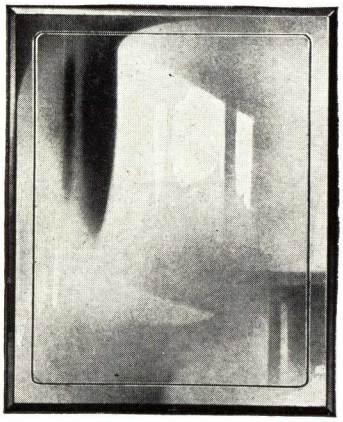
U. S. Patent No. 2,039,065



No. 338—Open



No. 338—Turning



No. 338—Closed

An entirely new idea in a fixture to hold soap, tumbler and tooth brushes. The panel revolves so as to entirely conceal the tooth brushes, soap and tumbler when not in use. Turns at a touch of the finger.

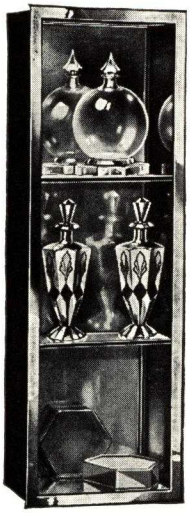
MADE IN TWO TYPES

No. 338L: Installed by setting in cement.

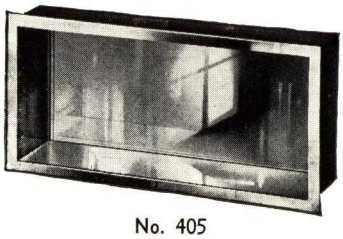
No. 388-S: Installed by wood screws through the side. Wood buck must be provided at either side of wall opening to take screws.

Wall opening for both types: $6\frac{5}{8}$x$8\frac{3}{8}$x$3\frac{1}{2}$ in.
Dimensions of both types over-all of the flange: $7\frac{1}{2}$x $8\frac{3}{4}$ in.

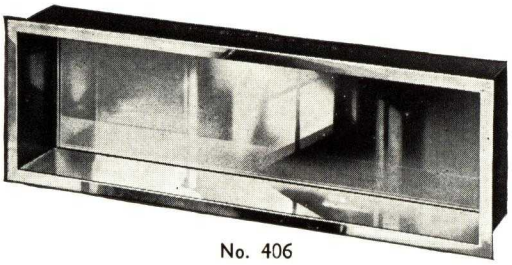
RECESS MIRROR SHELVES



No. 407

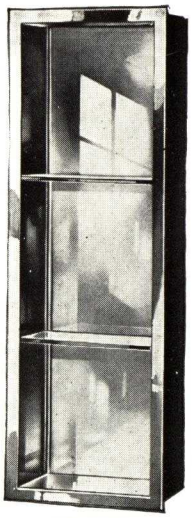


No. 405



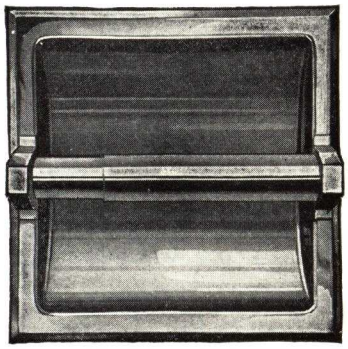
No. 406

Number	Wall opening, in.	Over-all of chromium plated flange, in.	Usually installed	Installed by wood screws
405	17¼ x 8¼ x 4½	17½ x 8¾	Over lavatory	Through sides
406	25½ x 8¼ x 4½	25¾ x 8¾	Over bathtub	Through sides
407	8¼ x 25½ x 4½	8½ x 25¾	At sides of cabinet or where desired	Through sides



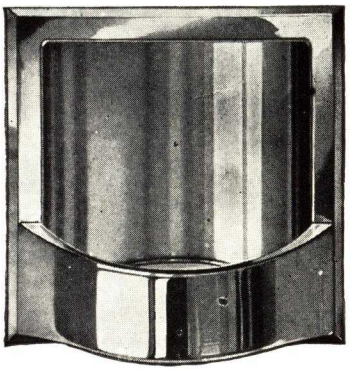
No. 407

One or more of these mirrored shelves add strikingly modern beauty to any bathroom. Their decorative value as well as their utility cannot be exaggerated. No. 407 is shown twice to suggest its use as a pair, one on either side of the medicine cabinet. It is just as striking used singly—wherever a decorative and colorful niche is desired.



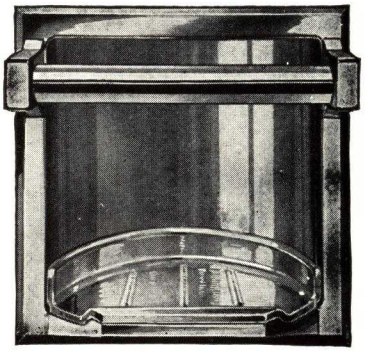
PAPER HOLDER

No. 375: Chromium Roller
No. 376: Black Wood Roller



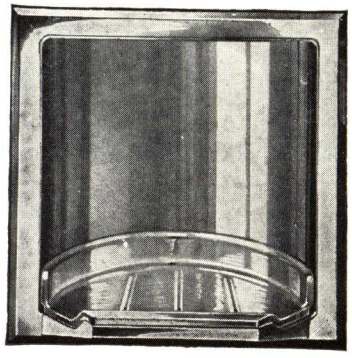
SPONGE HOLDER

No. 355: Self-draining



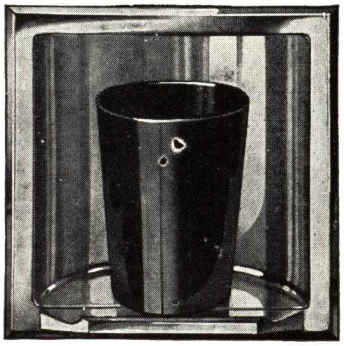
SOAP AND GRAB

No. 365: Crystal Soap Tray Is Removable for Easy Cleaning



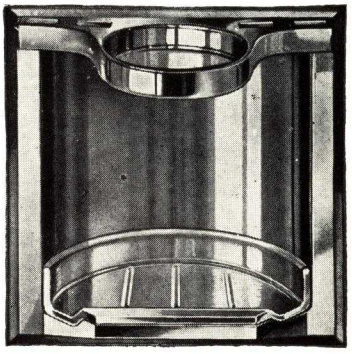
SOAP HOLDER

No. 325: Crystal Soap Tray Is Removable for Easy Cleaning



TUMBLER HOLDER

No. 345: Tumbler Not Included

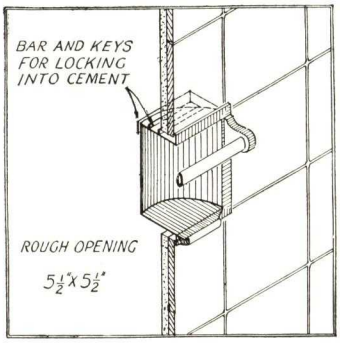


SOAP, TUMBLER AND TOOTH BRUSH HOLDER

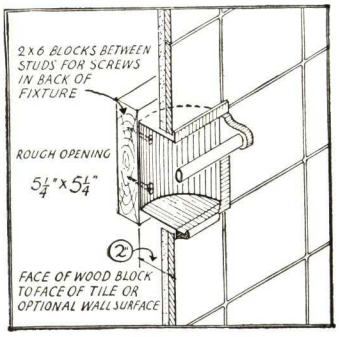
No. 335: A Complete Lavatory Unit in One Fixture

Non-draining glass trays for Nos. 325, 335, 365 are carried in stock and will be furnished instead of regular tray when specified.

All recessed accessories illustrated on this page, except No. 378, are 6⅛ in. square, over all of the flange, and take a wall opening of 5½x5½x2 in.

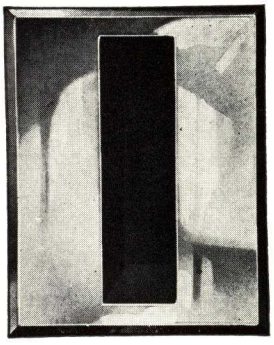


"L" Type • For Setting in Cement



"S" Type • Installed with Screws

IMPORTANT: Accessories pictured above are made in two different types and, in ordering, it is necessary to specify the type desired. If fixtures are to be installed with screws or toggle bolts, add "S" to catalog number. If fixtures are to be installed by setting in cement, add "L" to catalog number.



PAPER HOLDER

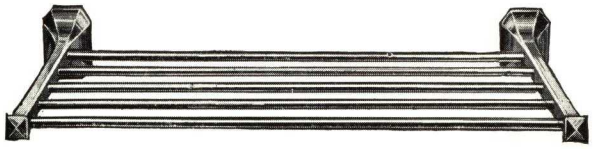
No. 378: For Folded Paper

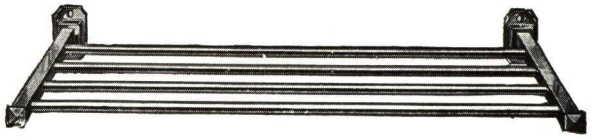
Size Overall: 4¾x6 in.

Wall Opening: 4½x5½x 2 in.

TRADE HALL-MACK MARK "Aristocrome"

TOWEL SUPPLY SHELVES



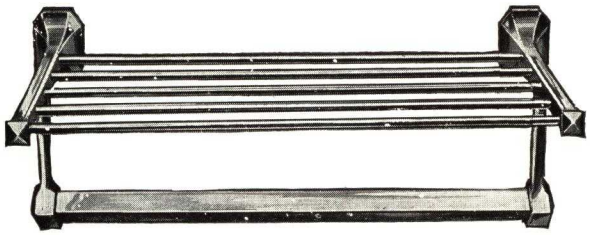


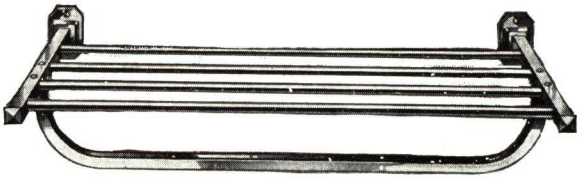
TOWEL SUPPLY SHELVES

No. 610: 9-in. Projection. Cast Brass Brackets.
Concealed Screw or Cement Installation

Specify "S" or "L" Type When Ordering.

No. 410: 8-in. Projection. Wrought Brass Brackets
Exposed Screw Installation Only





TOWEL SUPPLY SHELVES WITH BAR

No. 615: 9-in. Projection. Cast Brass Brackets
Concealed Screw or Cement Installation

Specify "S" or "L" Type When Ordering.

No. 415: 8-in. Projection. Wrought Brass Brackets
Exposed Screw Installation Only

Standard lengths of all shelves pictured above: 18, 24, 30 in. Special lengths to order.

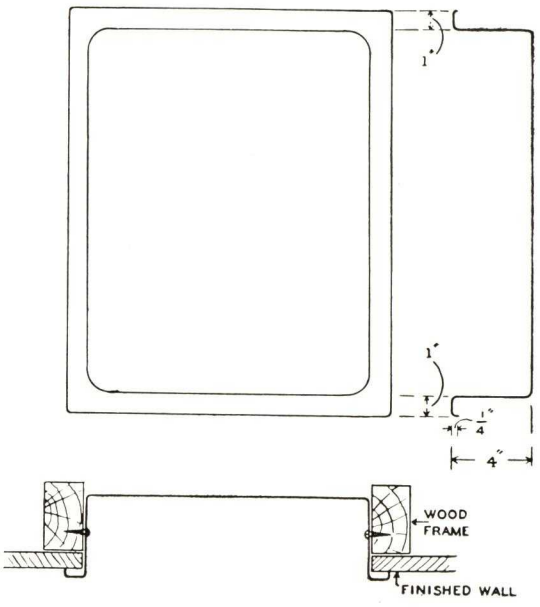
Bathroom Cabinet Installation Data • • •

ALL HALL-MACK Seamless Cabinets should be installed after the walls are completely finished. Installation is by four wood screws through the sides of the recessed case.

Leave wall opening of size indicated in catalog. Finish wall level to edge of opening. Tile not flush with plaster line must either completely surround the wall opening, or may be dropped below opening, keeping 2 in. or more away from wall opening at all points.

ROUND CABINETS

To facilitate the installation of HALL-MACK Circular Cabinets (pages 10 and 11), four curved wood blocks are furnished free, and packed with each cabinet. To use these blocks, simply make a wall opening 20½ in. square, and nail a block in each corner before lathing. Finish wall to edge of circular opening created by the blocks.



TRADE HALL-MACK MARK "Seamless"

LIFETIME PORCELAIN BATHROOM CABINETS

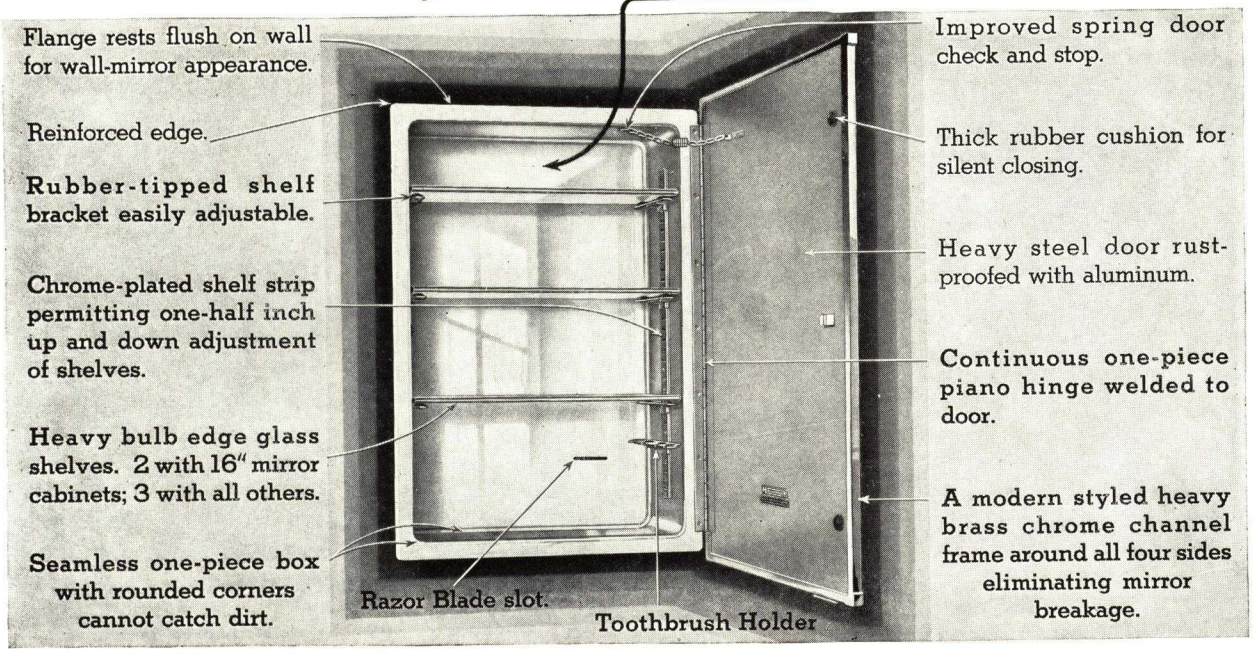
EVERY Hall-Mack Cabinet is built strong and sturdy—*without a single seam.* Drawn on a huge press from a single sheet of steel, the cabinet is formed complete in this operation. There is absolutely no clinching, crimping, spot-welding, soldering or gas welding.

THE ADVANTAGES OF HALL-MACK SEAMLESS CONSTRUCTION

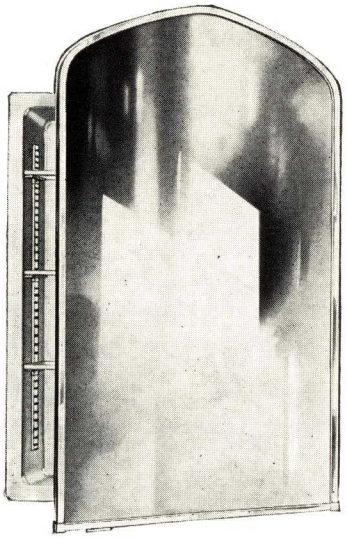
1. The definite assurance of rigid, substantial cabinet bodies.
2. Freedom from upkeep, year after year. No seams to open up and spoil the finish. No clinchings or weldings to become loose and need repair.
3. Utmost sanitary protection for the contents of the cabinet. No crevices to collect germs and dirt. Corners are rounded for easy and thorough cleaning.

In addition to these advantages, Hall-Mack Seamless Cabinets have another important feature—*they are moderate in price.*

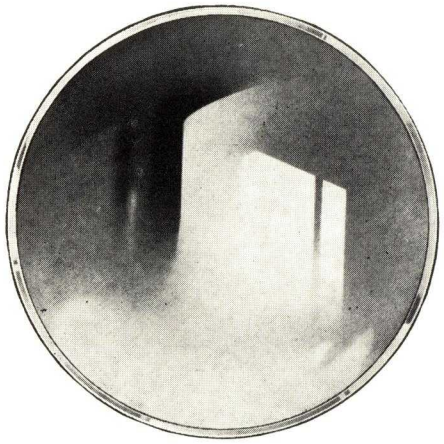
SEAMLESS *Porcelain* INTERIOR



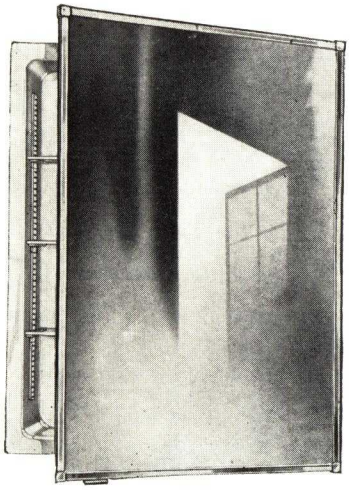
WITH *Chrome Frame* MIRROR



Number	Mirror, in.	Wall opening, in.
P1626C	16 x 26	14 x 20 x 4
P1830C	18 x 30	16 x 24 x 4
P2034C	20 x 34	18 x 28 x 4

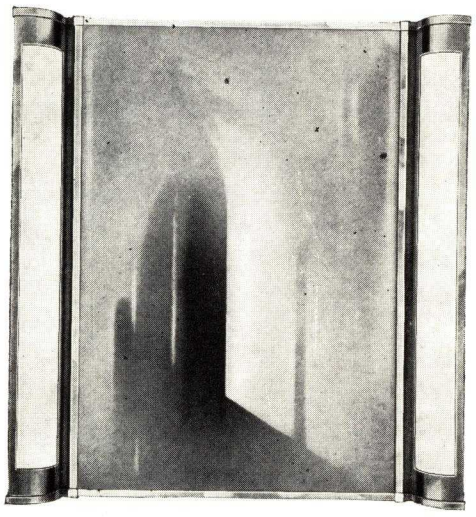


Number	Mirror, in.	Wall opening, in.
PR24C	24	20½ diam. *(See page 8)*



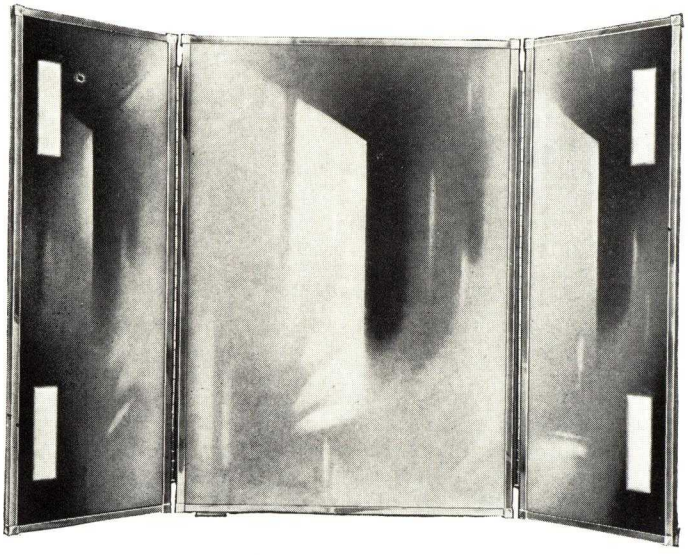
Number	Mirror, in.	Wall opening, in.
P1622C	16 x 22	14 x 20 x 4
P1826C	18 x 26	16 x 24 x 4
P2030C	20 x 30	18 x 28 x 4

WITH *Reflector Lights*



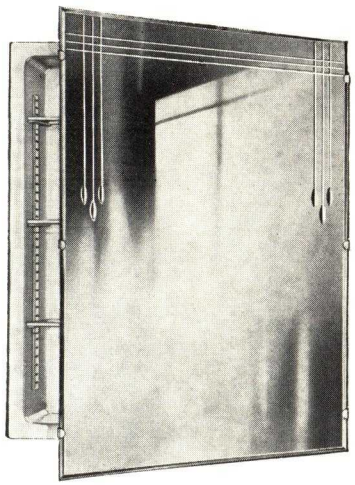
Number	Mirror, in.	Width overall, in.	Wall opening, in.
LP1826C	18 x 26	23	16 x 24 x 4

WITH *Vanity Lights*

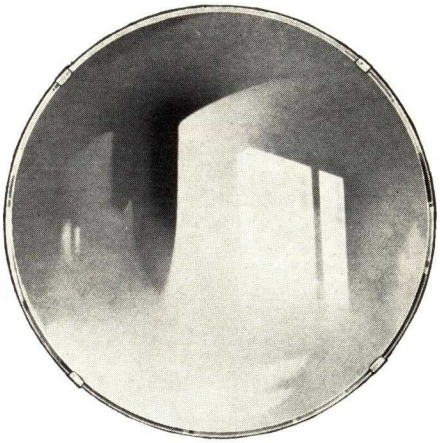


Number	Door mirror, in.	Wing mirrors, in.	Wall opening, in.
LWP1826C	18 x 26	8 x 26	16 x 24 x 4
WP1826C	Same as above—without lights		

WITH *Beveled Edge* MIRROR

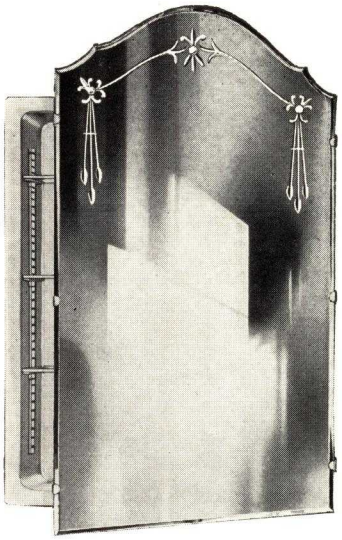


Number	Mirror, in.	Wall opening, in.
P1622	16 x 22	14 x 20 x 4
P1826	18 x 26	16 x 24 x 4
P2030	20 x 30	18 x 28 x 4



Number	Mirror, in.	Wall opening, in.
PR24	24	20½ diam. *(See page 8)*

The etched mirrors at left and right can be furnished plain (without etching) if desired.

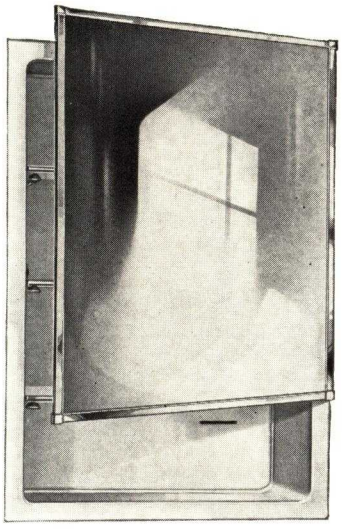


Number	Mirror, in.	Wall opening, in.
P1626	16 x 26	14 x 20 x 4
P1830	18 x 30	16 x 24 x 4
P2034	20 x 34	18 x 28 x 4

THE *Hotel Cabinet*

Finished in Lifetime Porcelain, this cabinet is especially designed for first-class installation. Its mirror door is bound on four sides with chromium-plated brass channel. Equipped with slot for discarded razor blades.

This cabinet is also furnished in baked enamel finish. See page following.



Number	Mirror, in.	Wall opening, in.
P1616C	16 x 16	14 x 20 x 4
P1819C	18 x 19	16 x 24 x 4

SPECIAL FEATURES

THE SEAMLESS CABINETS

All cabinets on this and the opposite page are drawn seamless from one piece of metal—without any clinching, crimping, soldering or welding.

If desired, the mirrors on any models pictured can be furnished with mitre lines.

The models shown on page 10 have their mirror doors bound with chromium-plated brass channel.

Wiring installation data for the electrically lighted cabinets furnished on request.

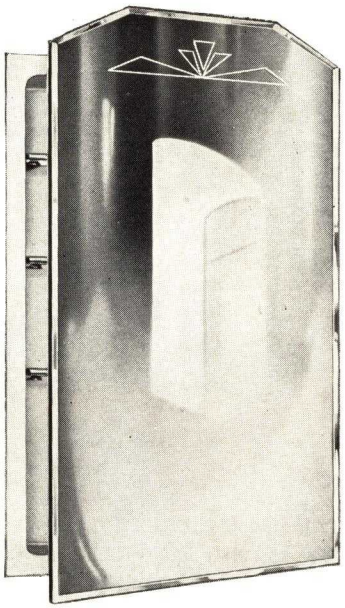
THE PORCELAIN INTERIORS

The interiors of the models pictured are finished in triple-fired vitreous porcelain—the same as on a bathtub. This finish is thoroughly cleaned with a damp cloth and will last indefinitely. It affords complete sanitary protection to the contents of the cabinet.

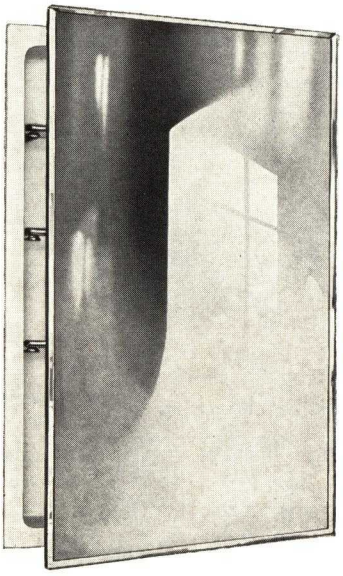
TRADE HALL-MACK MARK "Seamless"

BAKED ENAMEL CABINETS

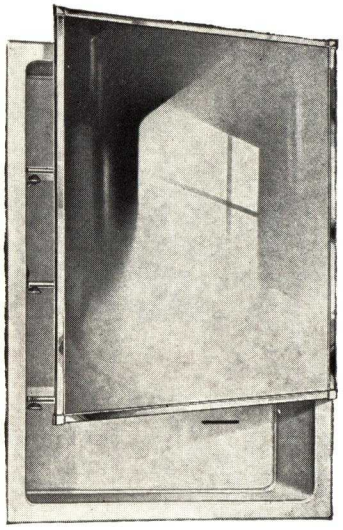
WITH *Chrome Frame* MIRROR



Number	Mirror, in.	Wall opening, in.
1624C	16 x 24	14 x 20 x 4
1828C	18 x 28	16 x 24 x 4



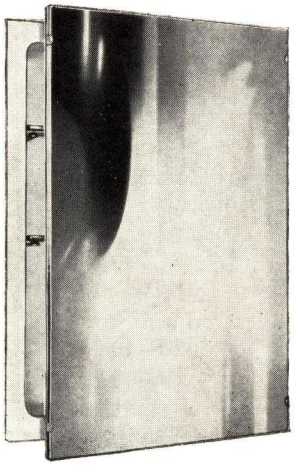
Number	Mirror, in.	Wall opening, in.
1622C	16 x 22	14 x 20 x 4
1826C	18 x 26	16 x 24 x 4



HOTEL CABINET

Number	Mirror, in.	Wall opening, in.
1616C	16 x 16	14 x 20 x 4
1819C	18 x 19	16 x 24 x 4

WITH *Plain Edge* MIRROR

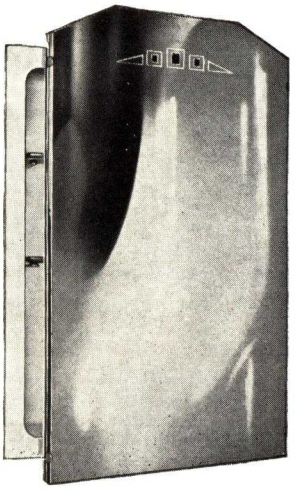


At Left:

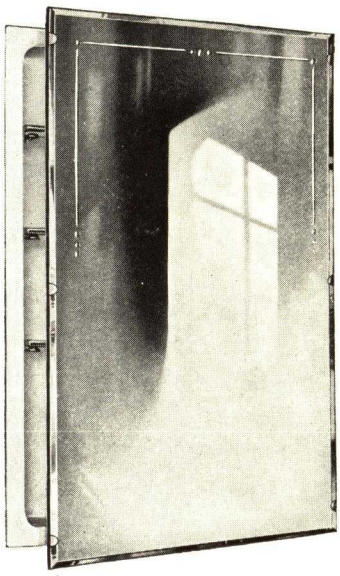
Number	Mirror, in.	Wall opening, in.
1622A	16 x 22	14 x 20 x 4

At Right:

Number	Mirror, in.	Wall opening, in.
1624A	16 x 24	14 x 20 x 4



WITH *Beveled Edge* MIRROR

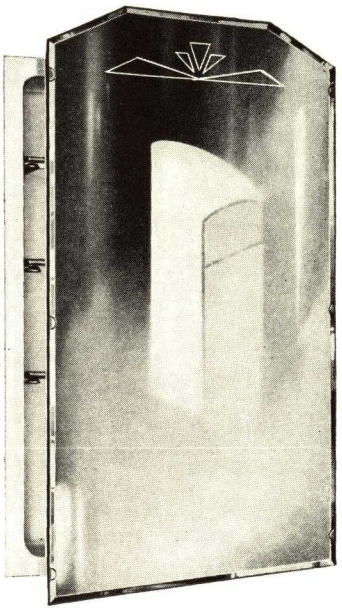


At Left:

Number	Mirror, in.	Wall opening, in.
1622	16 x 22	14 x 20 x 4
1826	18 x 26	16 x 24 x 4

At Right:

Number	Mirror, in.	Wall opening, in.
1624	16 x 24	14 x 20 x 4
1828	18 x 28	16 x 24 x 4



SPECIAL FEATURES

THE SEAMLESS CABINETS

The models pictured above and on the opposite page are drawn seamless from one piece of metal—without any clinching, crimping, soldering or welding.

The first two models at the top of the opposite page have chrome binding on the bottom and sides of the mirror. The Hotel Cabinet (upper right on page 12) has its mirror door bound on four sides with chromium-plated brass channel.

THE BAKED ENAMEL FINISH

The interiors of the cabinets pictured above and on the opposite page are finished with three coats of oven-baked enamel. This finish is recommended for lower priced jobs. The Hotel Cabinet, however, is also finished in Lifetime Porcelain; see page 11.

Lumiline BATHROOM LIGHTS • •

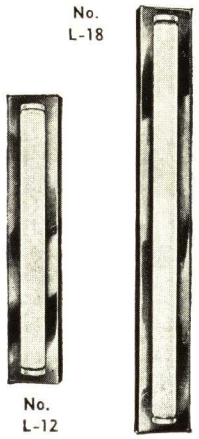
These lights are especially designed for use with any Hall-Mack Cabinet. They furnish exceptionally fine light for shaving or make-up—without glare or shadows.

Base of modern design is brass, chromium-plated. Wall switch control. Gem box required.

DIMENSIONS:

No. L-12: $2\frac{1}{4}$x$12\frac{3}{4}$ in.

No. L-18: $2\frac{1}{4}$x$18\frac{3}{4}$ in.



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https://archive.org/details/buildingtechnologyheritagelibrary

HALL-MACK

Bathroom Accessories and Seamless Medicine Cabinets

HALL-MACK Aristocrome Accessories of chromium plated forged brass and HALL-MACK Seamless Porcelain Cabinets are smart . . . but not expensive. Produced in large quantities and distributed throughout the nation, they are competitive in price with lines far less attractive.

HALLENSCHEID & McDONALD

FACTORY AND GENERAL OFFICES
LOS ANGELES • 1344 WEST WASHINGTON BOULEVARD

SAN FRANCISCO • 1159 HOWARD STREET CHICAGO • 743 N. WELLS STREET

Bathroom Accessories

by

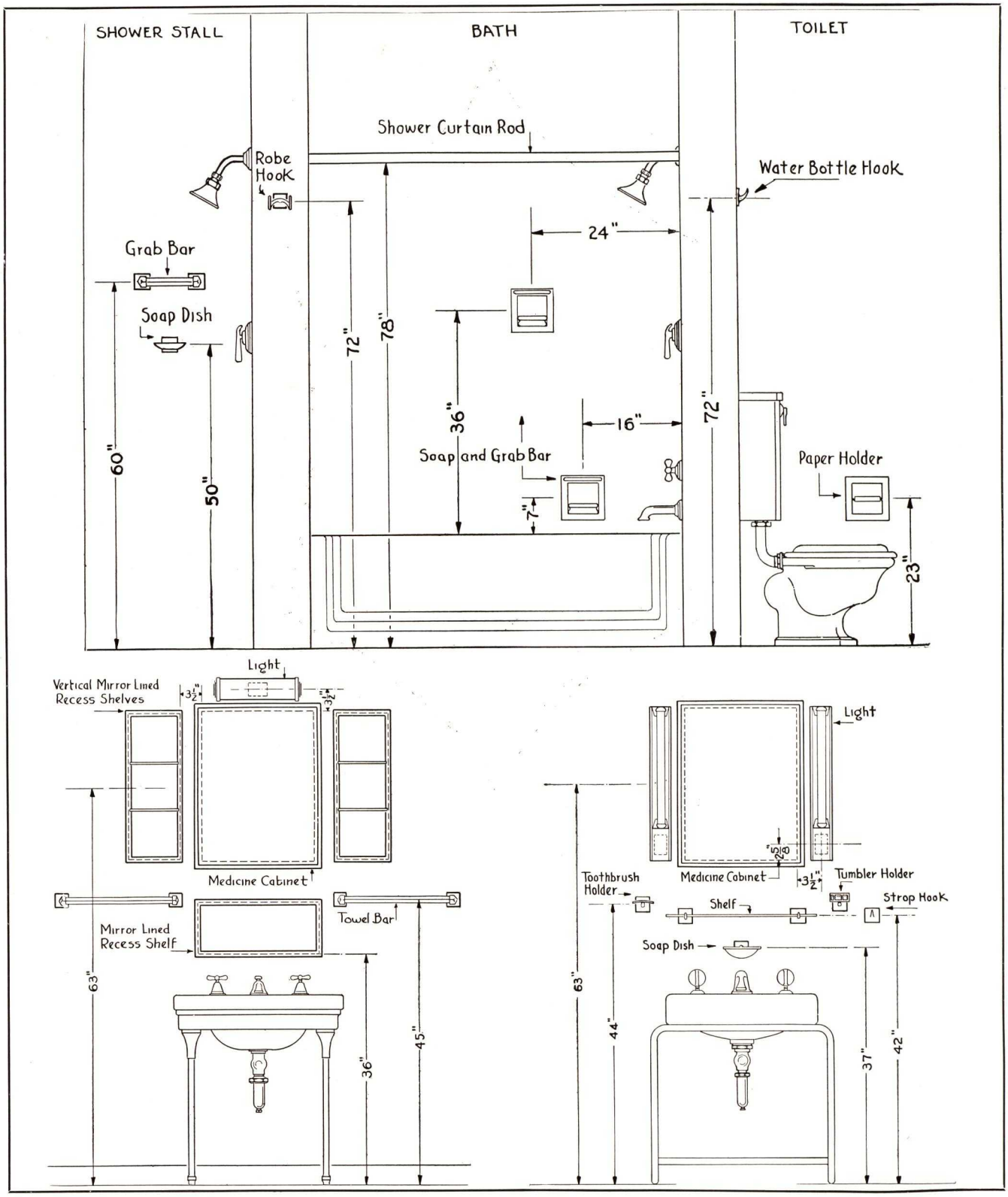
HOEGGER

HOEGGER Mounting Heights and Specifications HOEGGER

SPECIFICATION

All bathroom accessories, mirrors and medicine cabinets shall be those manufactured by Hoegger, Inc., Weehawken, New Jersey, and unless written consent is given by the architect or/and owner, no substitutions shall be made.

Hoegger Suggests these Mounting Heights for Your Convenience



HOEGGER, Inc. Weehawken, New Jersey

HOEGGER Installation Data, Prices & Deliveries HOEGGER

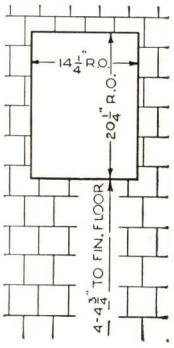
HOEGGER PATENTED RECESS CABINETS SHOULD NOT BE PLASTERED IN THE WALL.

LEAVE HOLE IN WALL EXACTLY AS INDICATED IN LITERATURE.

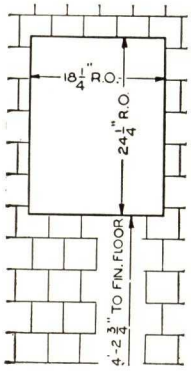
FINISH WALL **LEVEL** TO EDGE OF OPENING.

CABINET IS HELD IN WALL BY FOUR WOOD SCREWS THROUGH SIDES OF RECESS CASE.

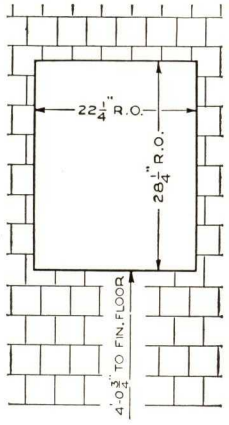
Please do not install cabinets until room is completely decorated and ready for occupancy.



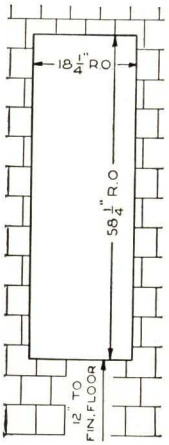
For Cabinets 43, 44, 46, 50, ST-50, 61, 75, ST-75, 272, 277, 292, 296



For Cabinets 40, 45, 47, 49, 51, ST-51, 62, 74, 76, ST-76, 273, 278, 293, 297

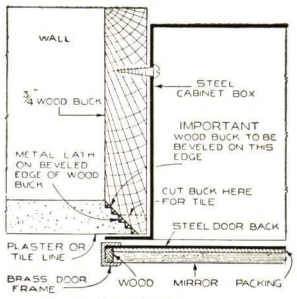


For Cabinets 63, 274, 294

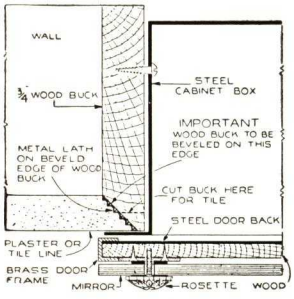


For Cabinets 65, 279

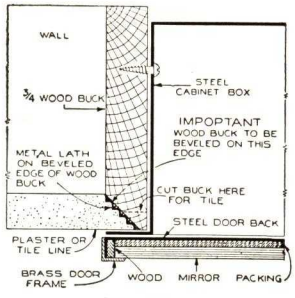
If cabinet door overhangs case, center of mirror should be 63" from finished floor.



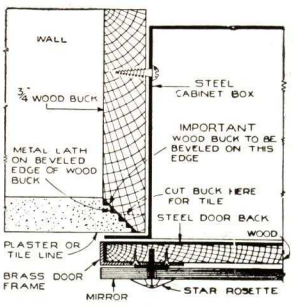
Installation "Imperiale" Cabinet



Installation "Parfait" Cabinet



Installation "Park Ave." Cabinet



Installation "Park Ave." Cabinet

Prices and Deliveries

Prices—All prices are F.O.B. Weehawken, N. J. Subject to change without notice.

Trade Discounts—On application, subject to change without notice.

Export Packing—An extra charge of 3% is made for all export packing.

Handling Charges—A handling charge of 25c is made for all orders under $10.00 net.

Returned Material—A 10% handling charge will be made on all material returned for credit with our permission, if in resalable condition.

Finish—For Satin Finish Crodon Accessories in small quantities add 20%; in large quantities add 10% to prices shown. For Satin Finish Crodon Cabinets and Mirrors, add $3.00 each to prices shown.

Deliveries—The Carriers are responsible for all goods lost, damaged or delayed in transit after accepting the shipment at our factory and claims MUST be made to the carrier's agent at destination by CONSIGNEE in writing to substantiate any formal claim necessary.

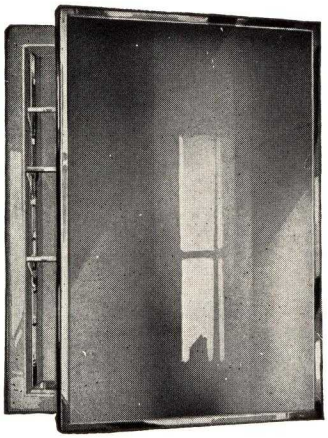
Errors—No claims for errors in shipments will be considered unless made within TEN DAYS of receipt of goods.

Special Products—Orders covering special goods are not subject to cancellation, except upon agreement to make payment for special work which has been performed.

Recess Medicine Cabinets

(Patents 1707013, Reissue 17510, 1738705)

14 Gauge Silver Finished Electrically Welded Steel Cabinets. Chromium Plated Brass Doors Flush with Wall. Stainless Steel Concealed Jack Knife Hinges and Door Stops. Adjustable Chromium Plated Brass Shelf Brackets —"First Quality" Mirrors. ½" Chromium Plated Brass Frames



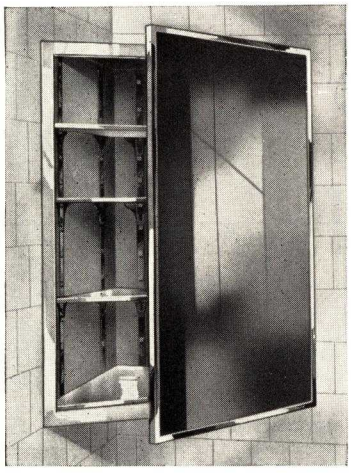
"PARK AVENUE" RECESS CABINETS

Cat. No.	Mirror	Rough Opening	Price
C-272-S	16x22	14¼x20¼x4½	**$30.00**
C-273-S	20x26	18¼x24¼x4½	**40.00**
C-274-S	24x30	22¼x28¼x4½	**50.00**

SPECIAL DEPTH CABINETS

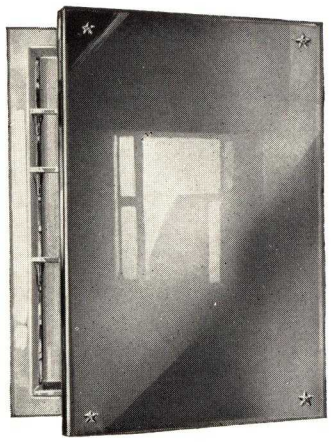
SINGLE CABINETS are regularly furnished 3½" and 4½" deep at the prices shown, but can be supplied in the following depths on order.

6"—Add..... **$10.00**
8"—Add..... **15.00**
10"—Add..... **20.00**
12"—Add..... **25.00**



"PARK AVENUE" CORNER CABINETS
Cabinet Extends 14" Each Way from Corner

Cat. No.	Mirror		Price
C-403-S	20x26	.....	**$70.00**

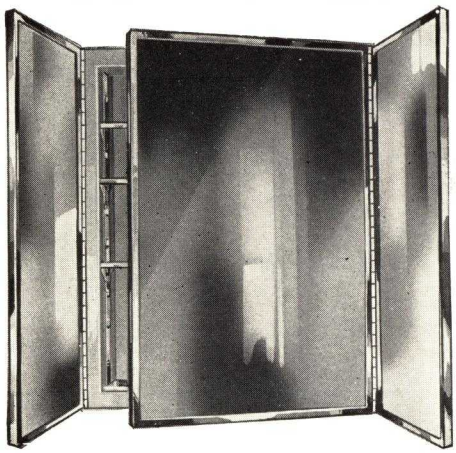


"PARK AVENUE" RECESS CABINETS
Polished Edge Mirrors

Cat. No.	Mirror	Rough Opening	Price
C-277-S	16x22	14¼x20¼x4½	**$36.00**
C-278-S	20x26	18¼x24¼x4½	**47.00**

"PARK AVENUE" MIRRORS ONLY
(No Cabinet)

C-977-S	16x22	.....	**$24.00**
C-978-S	20x26	.....	**32.00**

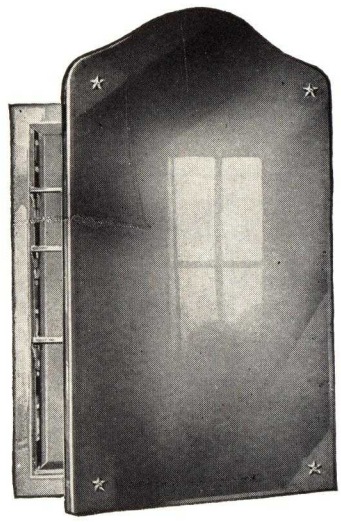


"PARK AVENUE" SINGLE RECESS CABINETS WITH SIDE MIRRORS

Cat. No.	Center Door	Side Mirrors	Rough Opening	Price
C-292-S	16x22	8x22	14¼x20¼x4½	**$63.00**
C-293-S	20x26	10x26	18¼x24¼x4½	**82.00**
C-294-S	24x30	12x30	22¼x28¼x4½	**101.00**

"PARK AVENUE" TRIPLE MIRRORS ONLY
(No Cabinet)

Cat. No.	Center Mirror	Side Mirrors	Price
C-992-S	16x22	8x22	**$50.00**
C-993-S	20x26	10x26	**66.50**
C-994-S	24x30	12x30	**87.50**

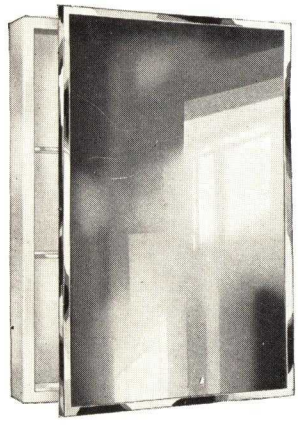


"PARK AVENUE"
CROWN TOP RECESS CABINETS
Polished Edge Mirrors

Cat. No.	Mirror	Rough Opening	Price
C-296-S	16x26	14¼x20¼x4½	**$41.00**
C-297-S	20x32	18¼x24¼x4½	**53.00**

ABOVE MIRRORS ONLY (No Cabinet)

C-996	16x26	.....	**$31.00**
C-997	20x32	.....	**42.50**



"PARK AVENUE"
MEDICINE CABINETS (SURFACE TYPE)

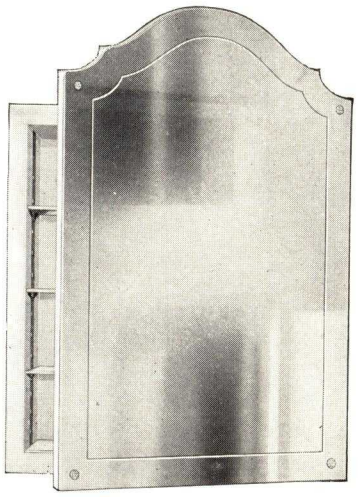
18 Gage Silver Finished Case (Inside and Outside) 3½" Deep—Other Depths to Order

C-442-S—16x22x4" deep..... **$33.50**
C-443-S—20x26x4" deep..... **43.10**

Recess Medicine Cabinets

(Patents 1707013, Reissue 17510, 1738705)

14 Gauge Silver Finished Electrically Welded Steel Cabinets. Chromium Plated Brass Doors Flush with Wall. Stainless Steel Concealed Jack Knife Hinges and Door Stops. Adjustable Chromium Plated Brass Shelf Brackets —"AA" Quality Mirrors. ½" Brass Chromium Plated Frames.



"PARFAIT" MEDICINE CABINETS
Polished Edge Mirrors

Cat. No.	Mirror	Rough Opening	Price
C-50-S	18x27	14¼x20¼x4½	$100.00
C-51-S	22x32	18¼x24¼x4½	120.00

"PARFAIT" MIRRORS ONLY
(No Cabinet)

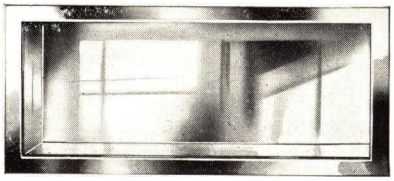
C-950-SP	18x27	.....	$81.50
C-951-SP	22x32	.....	96.50

STRAIGHT TOP "PARFAIT" RECESS CABINETS
Polished Edge Mirrors

Cat. No.	Mirror	Rough Opening	Price
ST-50-S	18x23	14¼x20¼x4½	$76.00
ST-51-S	22x27⅝	18¼x24¼x4½	93.50

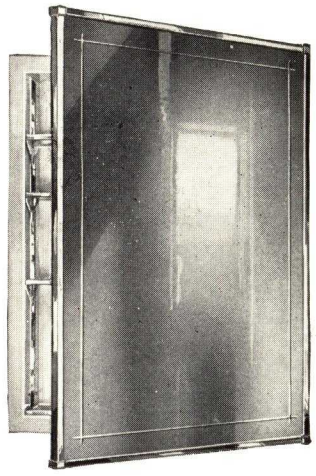
STRAIGHT TOP "PARFAIT" MIRRORS ONLY
(No Cabinet)

Cat. No.	Mirror	Price
ST-950	18x23	$58.00
ST-951	22x27⅝	71.00



MIRROR LINED RECESS SHELF

Cat.No.	Outside Size	Exact Opening	Price
C-644	16⅛x87⁄8x4	15½x8¼x4¼	$28.00
C-645	20⅛x87⁄8x4	19½x8¼x4¼	32.00
C-648	24⅛x87⁄8x4	23½x8¼x4¼	38.40
C-643	31⅛x9⅛x4	30½x8½x4¼	48.50



"IMPERIALE" CABINETS

Cat. No.	Mirror	Rough Opening	Price
C-61-S	16x22	14¼x20¼x4½	$52.00
C-62-S	20x26	18¼x24¼x4½	70.00
C-63-S	24x30	22¼x28¼x4½	88.00

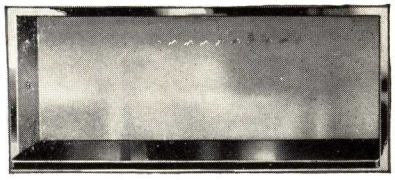
"IMPERIALE" MIRRORS ONLY (No Cabinet)

C-961-S	16x22	.....	$34.50
C-962-S	20x26	.....	48.00
C-963-S	24x30	.....	63.50

SPECIAL DEPTH CABINETS

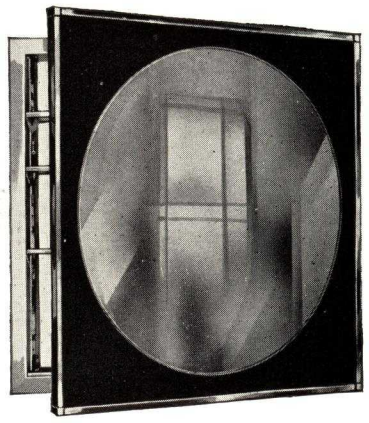
SINGLE CABINETS are regularly furnished 3½" and 4½" deep at the prices shown, but can be supplied in the following depths on order.

6"—Add..... $10.00
8"—Add..... 15.00
10"—Add..... 20.00
12"—Add..... 25.00



RECESS STAINLESS STEEL SHELF
With ⅜" Flange and 4½" Black Glass Shelf in Bottom

Cat.No	Outside Size	Exact Opening	Price
C-634	16x8¾x4	15½x8¼x4¼	$22.00
C-635	20x8¾x4	19½x8¼x4¼	25.65
C-639	24x8¾x4	23½x8¼x4¼	30.60
C-633	31x9 x4	30½x8½x4¼	39.00

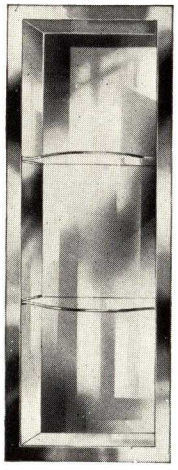


C-59-S

"ROUND-IMPERIALE" CABINET
Door 24x24"; Black Border Mirror 24x24"
Center Circle of Mirror 22"
Rough Opening 22¼x22¼x4½"
Price **$85.00**

C-959-S

"ROUND-IMPERIALE" MIRROR ONLY
(No Cabinet)
Black Border Mirror 24x24"
Center Circle of Mirror 22"
Price **$64.00**



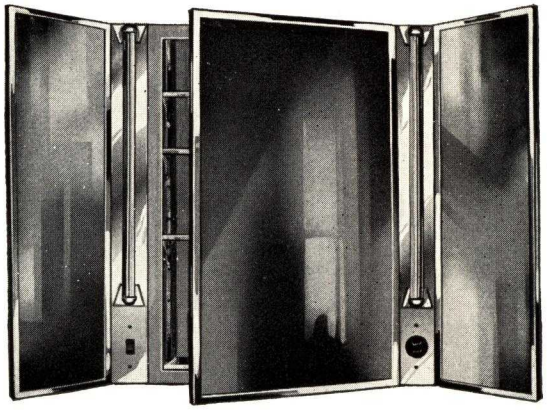
VERTICAL MIRROR LINED RECESS SHELVES

Cat. No.	Outside Size	Exact Opening	Price
C-653	8⅞x20⅛x4¼	8¼x19½x4½	$35.00
C-654	8⅞x24⅛x4¼	8¼x23½x4½	41.50
C-655	8⅞x28⅛x4¼	8¼x27½x4½	47.70

HOEGGER Illuminated Recess Medicine Cabinets HOEGGER

(Patents 1707013, Reissue 17510, 1738705)

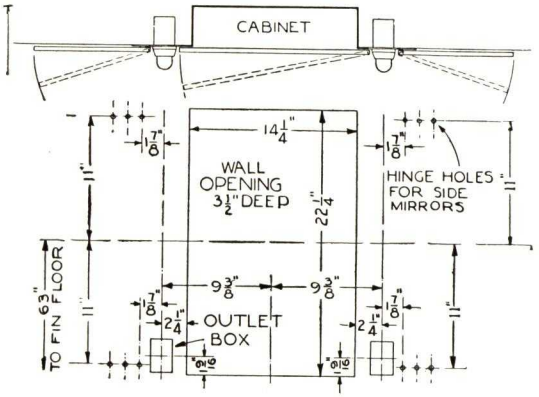
14 Gauge Silver Finished Electrically Welded Steel Cabinets. Chromium Plated Brass Doors Flush with Wall. Stainless Steel Concealed Jack Knife Hinges and Door Stops. Adjustable Chromium Plated Brass Shelf Brackets —"First Quality" Mirrors. ½" Brass Chromium Plated Frames.



Center Mirror 16x24"; Side Mirrors 10x24"
Overall Size 41½x24x3½" deep

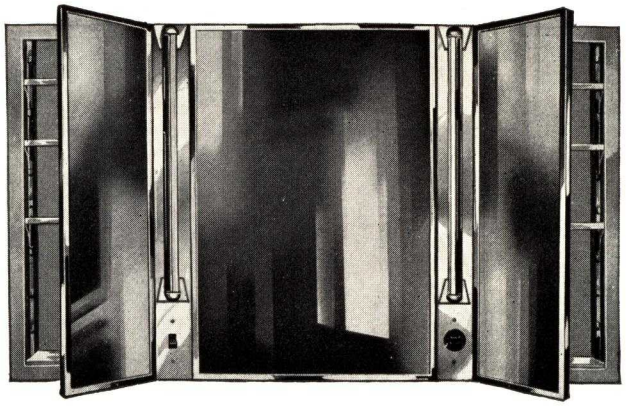
C-284-S—Illuminated Cabinet with Side Mirrors.....**$125.00**
C-281-S—Illuminated Cabinet—No Side Mirrors..... **81.00**

Wood Wall Buck for above **$20.00**



Installation Data for C-284 Cabinet Illustrated at Left

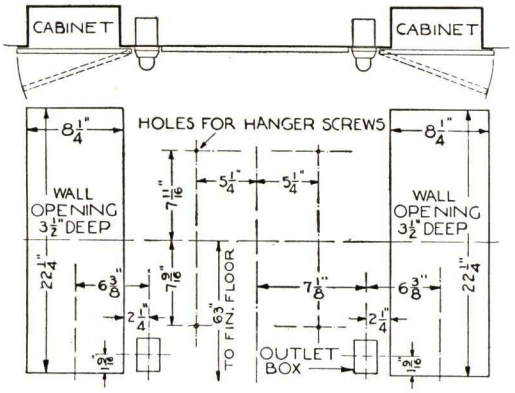
Cabinet, Lights and Side Mirrors are shipped as separate units to be assembled on job



Center Mirror 16x24"; Side Mirrors 10x24"
Overall Size 41½x24x3½" deep

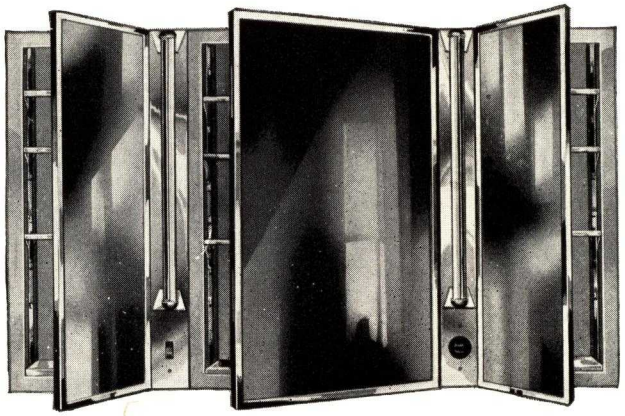
C-285-S—Illuminated Mirror with Recess Side Cabinets.....**$135.00**

Wood Wall Buck for above **$20.00**



Installation Data for C-285 Cabinet Illustrated at Left

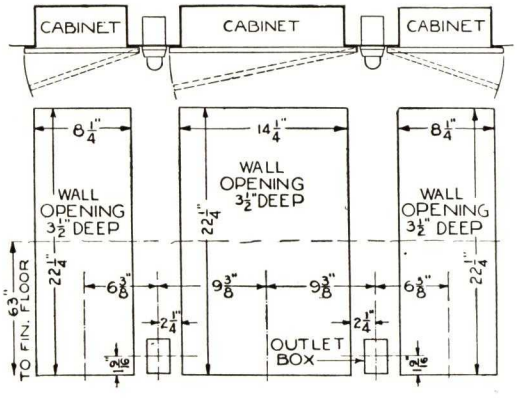
Mirror, Lights and Side Cabinets are shipped as separate units to be assembled on job



Center Mirror 16x24"; Side Mirrors 10x24"
Overall Size 41½x24x3½" deep

C-286-S—Illuminated Triple Recess Cabinets.....**$166.00**

Wood Wall Buck for above **$25.00**



Installation Data for C-286 Cabinet Illustrated at Left

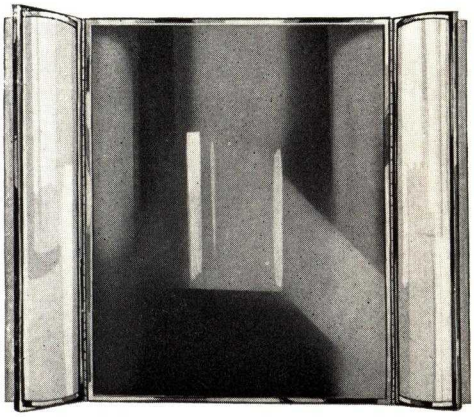
Center Cabinet, Lights and Side Cabinets are shipped as separate units to be assembled on job

Wood Bucks are recommended to simplify installation

"Hoeggerlite" and Supply Cabinets

(Patents 1707013, Reissue 17510, 1738705)

14 Gauge Silver Finished Electrically Welded Steel Cabinets. Chromium Plated Brass Doors Flush with Wall. Stainless Steel Concealed Jack Knife Hinges and Door Stops. Adjustable Chromium Plated Brass Shelf Brackets —"AA" Quality Mirrors. ½" Brass Chromium Plated Frames.



"HOEGGERLITE" RECESS CABINET
(Patents 1868104, 1948111, 1948112)

Adjustable Side Wing Illuminated Panels

C-64-S—Silver Finished Cabinet and Reflectors—First Quality Mirror—No Mitre Lines... **$130.00**

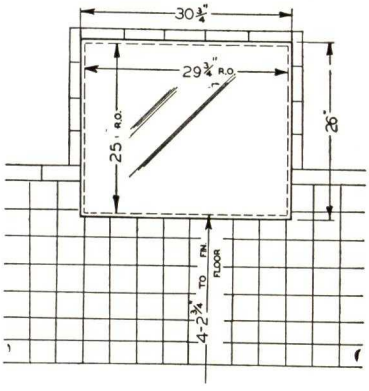
C-60-S—Silver Finished Cabinet — Stainless Steel Reflectors—"AA" Quality Mirror—With or Without Mitre Lines..... **180.00**

C-80-S—Stainless Steel Cabinet and Reflectors—"AA" Quality Mirror—With or Without Mitre Lines..... **250.00**

Center 20x26". Mirror Door conceals a 4½" deep Cabinet.

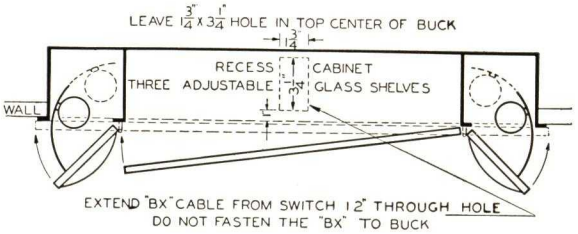
Illuminated 5x26" Side Panels, adjustable to any position, giving shadowless light in front of Mirror.

Takes standard bulbs up to 40 watt.

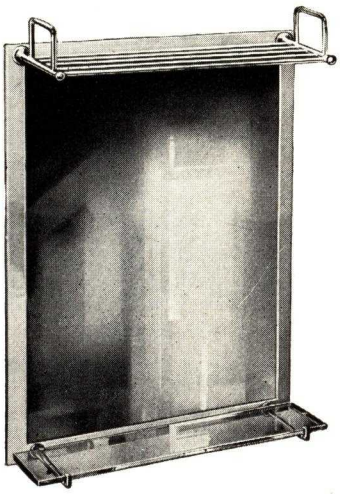


TYPICAL INSTALLATION OF "HOEGGERLITE" CABINET

Leave Rough Opening 29¾x25x4½" deep



These "Hoeggerlite" Cabinets are included under the Underwriters' Laboratories list of inspected electrical appliances.



COMBINATION MIRROR AND SHELF

"First Quality" 16x22" Mirror

Outside Size 18x24"
1" Frame

Cat. No.	Types	List Price
S-923-S	Mirror only (Silver Frame)..	$15.80
C-923-S	Mirror only (Crodon Frame).	25.00
S-924-S	Mirror (Silver Frame) and Glass Shelf Combination...	21.80
C-924-S	Mirror (Crodon Frame) and Glass Shelf Combination...	30.50
S-925-S	Mirror (Silver Frame) Glass Shelf and Towel Shelf Combination.....	28.40
C-925-S	Mirror (Crodon Frame) Glass Shelf and Towel Shelf Combination.....	36.70

GENERAL CABINET INFORMATION

SURFACE TYPE CABINETS

5" Projection

The following cabinets can be furnished "surface type"—ST-50, ST-51, C-61 and C-62, C-63, C-272, C-273, C-274, C-277 and C-278.

Cabinet Size	Add to List Price of Recess
16x22	$6.00
20x26	7.00
24x30	8.00

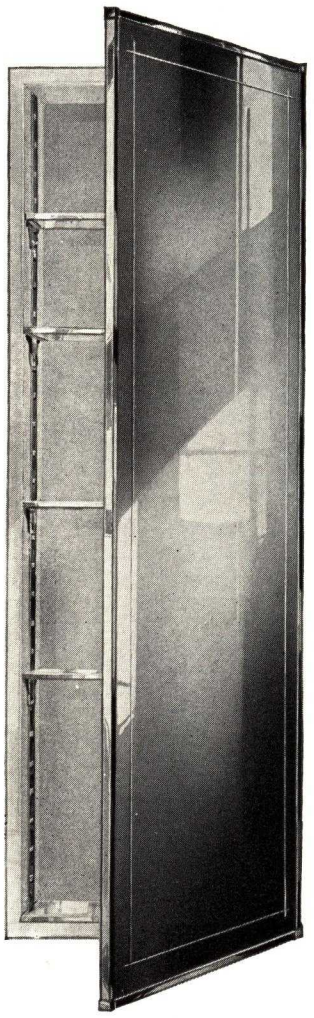
STAINLESS STEEL RECESS CABINETS 4½" DEEP

For Stainless Steel in place of white enamel cabinets, add the following to the list prices shown.

Single Cabinets

Cabinet Size	Add to List Price Shown
16x22	$40.00
20x26	50.00
24x30	60.00
20x60	90.00

C-281..... **$40.00**
C-284..... **40.00**



C-65-S

RECESS SUPPLY CABINET AND DRESSING MIRROR

Bottom of Cabinet should be 12" above finished floor line.

Mirror 20x60"

Wall Opening 18¼x58¼x4½

C-279-S—"First Quality" Mirror. No Mitre Lines—White Enameled Cabinet..... **$100.00**

C-65-S—"AA" Mirror. As Illustrated — Silver Finished Cabinet... **180.00**

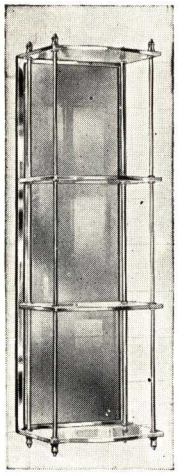
SPECIAL DEPTH SUPPLY CABINETS

These cabinets are regularly furnished 4½" deep, at the prices shown, but can also be supplied in the following depths on order:—

6" deep—Add..... **$15.00**
8" deep—Add..... **30.00**
10" deep—Add..... **45.00**
12" deep—Add..... **60.00**

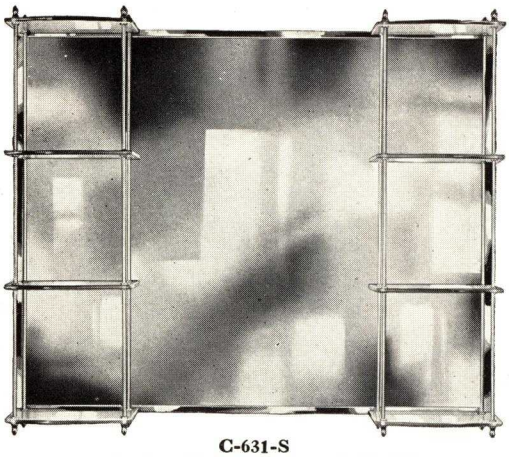
Mirror and Shelf Combinations

ALL MIRRORS SHOWN BELOW HAVE ½" CHROMIUM PLATED BRASS FRAMES AND HOEGGER CONCEALED HANGERS



Left:

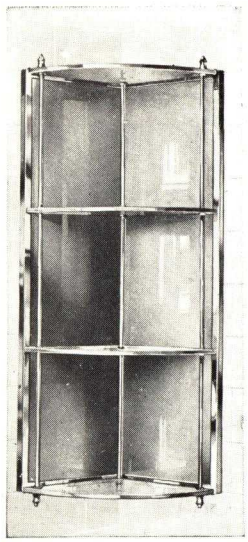
C-627-S
TIER OF SHELVES
"First Quality" Mirrors
½" Brass "Crodon" Angle Frame
Concealed Wall Hangers
Width 8"
Height 24"
Projection 7"
Crystal.....**$25.00**
Black..... **35.00**
As above only no Mirror or Frame
C-637
Crystal
$12.00
Black
$22.00



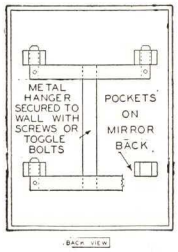
C-631-S
MIRROR AND SHELF COMBINATION
"First Quality" Mirrors
½" Brass "Crodon" Angle Frame
Concealed Wall Hangers
Overall Size 30x24"
Projection 7"
Crystal Glass Shelves.....**$52.00**
Black Glass Shelves..... **72.00**

Right:

C-628-S
CORNER TIER OF SHELVES
"First Quality" Mirrors
½" Brass "Crodon" Angle Frame
Concealed Wall Hangers
Sides 9x24"
Height 24"
Projection 9"
Crystal
$30.00
Black
$40.00
As above only no Mirror or Frame
C-638
Crystal
$12.00
Black
$22.00



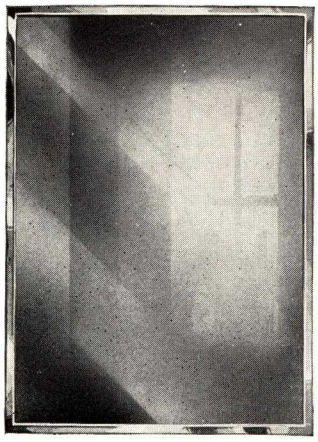
HOEGGER
PATENTED CONCEALED HANGER
Pats. 1,745,574; 1,908,147



Important

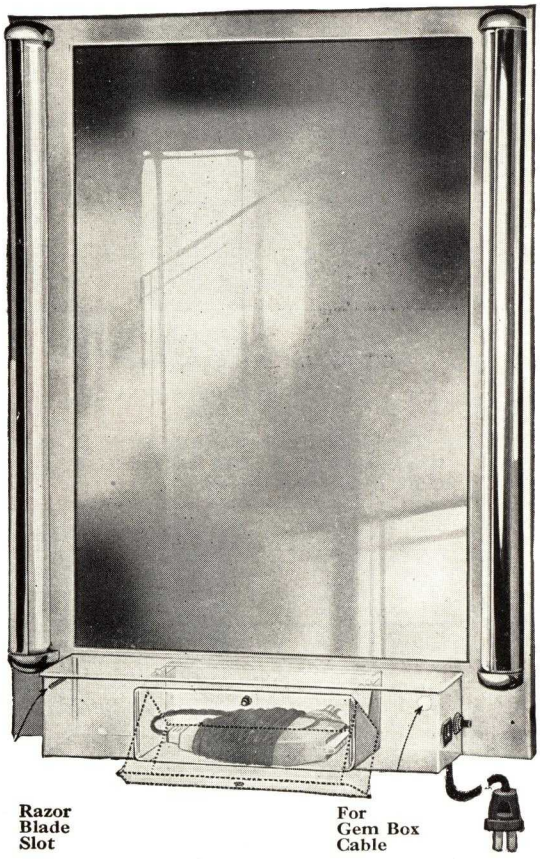
When ordering mirrors give first the width and then the height or state definitely which way the mirror will be hung so that the hangers may be properly placed.

THEFTPROOF HANGERS
If Theftproof Hangers Are Desired ADD $1.00 to List Price



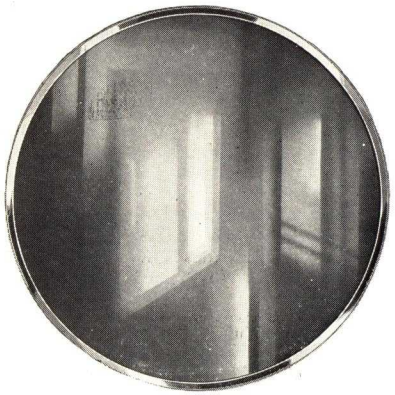
C-919-S
"FIRST QUALITY" MIRROR
½" Brass "Crodon" Angle Frame

Plain Mirror	Price	Plain Mirror	Price
12x18	$ 9.35	24x30	$26.40
14x20	11.30	24x36	31.40
16x22	14.30	24x48	41.30
18x24	17.50	24x60	50.60
20x26	20.20		



MODERN ILLUMINATED MIRROR
SHAVING AND VANITY
Designed for the NEW ELECTRIC RAZORS
Silver Baked Enamel on Steel

S-927—With Cord and Plug.....**$28.50**
S-928—Wired for Gem Box..... **28.50**



C-902
Circular Mirrors

Diameter	Price
18"	$30.00
24"	40.00
30"	50.00
36"	60.00

C-900-S MIRROR
Grade "A" Mirror
½" Brass "Crodon" Channel Frame

Mirror	Price
12x18	$15.45
14x20	18.90
18x24	26.75

Forged Brass Lighting Fixtures

TUBULAR LIGHT

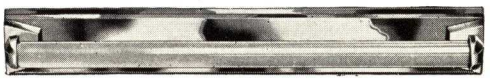
For Vertical or Horizontal Mounting

Diameter, 3½″; Projection, 3½″

Install center of GEM BOX 4″ from side or top of cabinet opening (or 4″ above crown of cabinet).

Cat. No.	Length or Height	Price
C-37-S	8″	**$ 9.00**
C-36-S	14″	**$12.00**
C-24-S	21″	**$18.00**

For Turn Canopy Switch on End Cap, and $1.00



HOEGGER LUMILITE

With Rotating Shade

U. S. Patent 1636364

Width, 2⅞″; Projection, 2¼″

Install center of GEM BOX 3⅜″ from side or top of cabinet opening (or 3⅜″ above crown of cabinet).

Cat. No.	Length or Height	Watts	With Shade
C-22	13″	**40**	**$11.00**
C-23	19″	**60**	**12.00**
C-21	26″	**80**	**22.00**

Bulbs only C–22 **$2.50**, C–23 **$2.50**
C–21 **$5.00** pair
For External Switch on Flange add **$3.50**

C-14
$16.00

HOEGGER LUMILITES

With Switch and Service Outlet for mounting on Sides of Medicine Cabinet

With Rotating Shade

60 Watt Lamps

U. S. Patent 1636364
Width, 2⅞″
Length, 24″
Projection, 2¼″

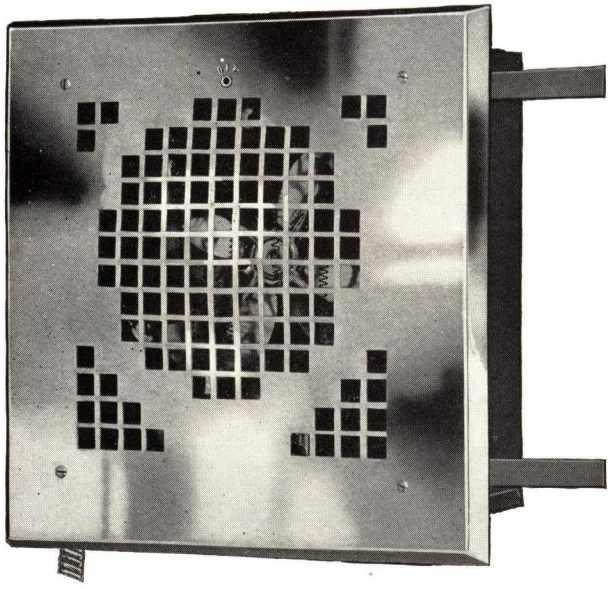
Install GEM BOX vertically on centers 3⅜″ from side and 1 9/16″ from bottom of cabinet opening

or

on centers 1 7/16″ from side and 2 9/16″ from bottom of light.

C-15
$16.00

RECESS CHROMIUM PLATED ELECTRIC HEATER

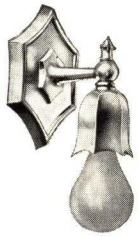


The steel wall buck is installed when the wall is erected. Heater buck is placed inside of wall buck and is adjustable to allow grill to fit tightly against wall surface.

Watts, 1300
Grill, 12x12″; Projection, ¾″
Wall Buck, 10½x10½x4½″ deep

C-192—$32.00

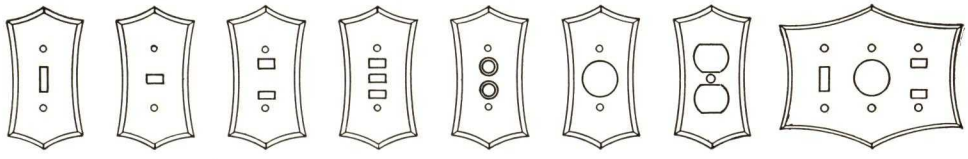
C-27-P—$8.50
Diameter, 6¾″
Depth, 5½″
Chain pull switch, add $2.00



C-33-P—$11.00
Projection, 4½″
Height, 8½″
Outlet box 69″ from floor line
If mounted with bulb up, outlet box 63″ from floor line
Switch on wall flange, add $1.00

C-28-P—$11.50
Projection, 5⅛″
Height, 8″
Outlet box 65″ from floor line
Switch on wall flange, add $1.00

"CRODON" PLATED BRASS PARFAIT SWITCH PLATES



"T" Toggle | **"JT" Junior Toggle** | **"2JT" Double Junior Toggle** | **"3JT" Triple Junior Toggle** | **"P" Push** | **"S" Service** | **"2S" Duplex Service** | **"3 Gang T-S-2JT" Method of Ordering Multiple Gang Plates**

Switch plates other than shown above made to order when sufficient details for manufacture are supplied.

LIST PRICES

Type	Width, in.	Height, in.	List Price
Single	3¼	5½	**$2.10**
*2-gang	5⅜	5½	**4.70**
*3-gang	7⅛	6	**6.60**
*4-gang	9	6	**8.20**

*Gang combination plates on order only

Mounting Features HOEGGER ACCESSORIES

(Patent No. 1636364)

HOEGGER surface applied accessories consist essentially of two parts, the fixture proper and the solid brass concealed back plate. The back plates are made in several types to facilitate mounting on the various kinds of wall construction. The fixture is rigidly secured to the back plate by a single concealed set screw which is regularly furnished slotted for screw driver, but where fixtures are used in public places, a special theft-proof set screw will be furnished when specified.

Advantages of HOEGGER Concealed Plate type mounting are:

(1) They are easily and quickly installed in any type of wall construction.

(2) The back plates may be shipped to the job and installed in advance, as the fixtures are not attached until the rooms are completely decorated, thus eliminating any possible loss from theft or injury.

(3) Fixtures may be easily removed whenever it is necessary to redecorate the room.

(4) Due to the construction of the patented back plate post the fixture is forced tightly against the wall surface when set screw is tightened, thus assuring a neat, tight-fitting assembly that will not work loose.

HOEGGER Concealed Back Plates are made in several types to meet the various conditions in wall construction:

"S" Type—(Supplied with fixtures.) Can be mounted on any type of wall. This is our regular plate and is shipped with all fixtures unless otherwise specified.

"SA" Type—(Supplied with fixtures.) "Anker-in" plate set in wall with plaster of paris. Anchors made in two lengths—1¼ in. long for tile or marble walls and 2¼ in. long for cement or plaster walls.

"B" Type—Wall anchor bar—made for new work only where tile or glass walls are erected. The brass lugs drilled to receive the regular "S" plates are mounted on a ⅛x1 in. galvanized bar which is placed in the wall during its erection.

All fixtures except 513 and 518 are interchangeable on all HOEGGER back plates.

Installing Directions for Hoegger Concealed Plates

(Patent No. 1636364)

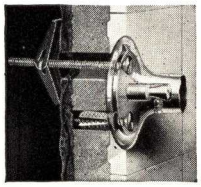
All HOEGGER Concealed Plates are mounted so that lug is on top (Fig. 1). This lug fits in a recess and keeps the fixture from turning on the concealed plates.

Where fixtures require two concealed plates, as towel and grab bars, carefully measure center to center distance of plates from assembled fixture.

Note: Where conditions warrant, a templet will be furnished for all double plate fixtures.

Important When Ordering

If Anker-in type of wall fastening is wanted add "A" to the letter already following the catalogue number and designate the length of anchor required. If concealed screw type is wanted use the catalogue number as shown.



Concealed Screw (S) Type Plate

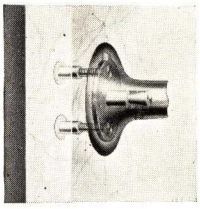
Installing Directions

On Wood—Use inclosed wood screws.

On Tile—Use inclosed wood screws and lead shields.

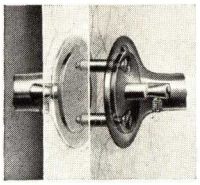
On Plaster—Use inclosed wood screws and rawl plugs or toggle bolts.

Note: Plate may be fastened by top screw only, fixture put on and adjusted as required, then fixture carefully removed and hole drilled for bottom screw.



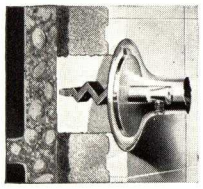
Left:
"S" Type Plate Mounted on Marble with Chromium Plated Buttons and Screw

Right:
"S" Type Plates Mounted Back to Back on Marble with Sleeves and Screws



Important: Drill holes vertically 1⅛ in. center to center.

Fig. 1 A



Anker-in (SA) Type Plate

Installing Directions

Cut hole in wall ¾ in. in diameter, 1½ in. deep for short anchor plates used on tile or marble walls, and 2½ in. deep for long anchor plates used on cement, plaster or glass walls. Fill hole with plaster of paris, placing some on anchor, and insert with lug at top (Fig 1). Hold until set—a few seconds.

Important: Fixtures should not be put on plates for at least one hour or preferably after room is decorated and ready for occupancy.

Brass Machine Screws

10-24 and 14-20

To fit Brass Sleeves and Chromium Plated Buttons

Brass Sleeves

Price Per 100

Length	¼″ Diam. Tapped 10-24	5/16″ Diam. Tapped 14-20
¾″	$4.30	$5.85
⅞″	4.40	6.05
1″	4.50	6.20

Chromium Plated Buttons

Price Per 100

Shank 9/32 dia. x 5/16″, Tapped 10-24 ..... **$6.50**

Shank ⅜ dia. x ¾″, Tapped 14-20 ..... **9.50**

Hoegger Wall Anchor Bars

(Patent applied for)

Wall Anchor Bar Used for Mounting Double Post Fixture

This type of wall anchorage was developed for large installations such as hotels, office buildings, apartments, schools, etc.

Can be used on new work only, as bars must be installed as tile wall is laid.

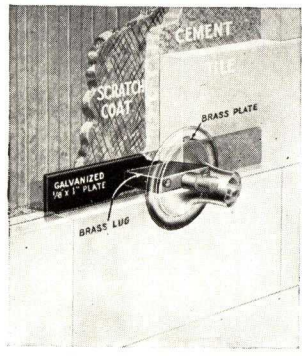
In addition to spacing for double post fixtures they assure that the fixtures will be level as the bars are placed on top of a course of tile nearest the proper height.

Always specify tile thickness when ordering Wall Anchor Bars.

Important When Installing Wall Anchor Bars—Brass lugs must not extend beyond tile surface.

Prices—Concealed Back Plates and Bars

	Each
F, H, M, S, T or Y. Plates with Wood Screws.	$0.25
FA, HA, MA, SA, TA or YA. "Anker-in" Plates—1¼″ Long	.40
FA, HA, MA, SA, TA or YA. "Anker-in" Plates—2¼″ Long	.50
FB, HB, SB, TB or YB. Anchor Bars—Single	.30
FB, HB, SB, TB or YB. Anchor Bars—Double	.70



"B" Wall Anchor Bar

Phantom view showing relative position of bar and wall construction.

CHASED ROSETTE

Chromium Plated Brass Rosette and 1¼″ No. 8 Wood Screw

C-301 **$0.50**

"STAR" ROSETTE

Chromium Plated Brass Rosette and 1¼″ No. 8 Wood Screw

C-302 **$0.50**

HOEGGER "SNAP-ON" BUTTON

Chromium Plated Brass Button Snaps on head of 2″ No. 12 Brass Wood Screw

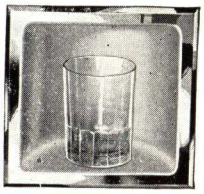
C-303 **$0.50**

HOEGGER "Square" Recess & Tyteset Accessories HOEGGER

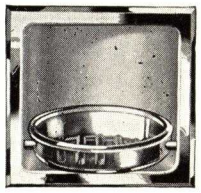
(Patents 1636364—1773815—1962739—1997686)

Drawn in one piece from .040″ brass—chromium plated. Designed to be cemented in wall—no buck required.

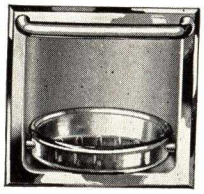
OUTSIDE SIZE 7¼x7¼″—LEAVE EXACT OPENING 6x6x2⅞″ DEEP



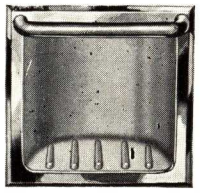
C-168-S
TUMBLER HOLDER
Price **$4.20**
(Without Tumbler)



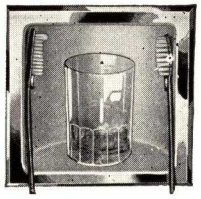
C-164-S
SOAP HOLDER
Crystal Dish.....**$5.85**
Black Dish..... **6.05**
Metal Tray..... **7.85**



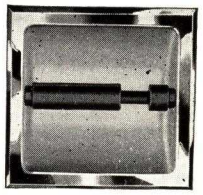
C-165-S
SOAP and GRAB BAR
Projection 2″
Crystal Dish.....**$7.60**
Black Dish..... **7.80**



C-166-S
SOAP and GRAB BAR
Projection 2″
Removable Metal Tray
Price **$9.60**



C-169-S
TUMBLER AND TOOTHBRUSH HOLDER
Price **$5.60**
(Without Tumbler)



C-162-S
PAPER HOLDER
Wooden Roller...**$4.50**
Metal Roller..... **5.30**

METHOD OF INSTALLING TYTESET ACCESSORIES

Fasten concealed mounting plate to Wall (Fig. 1). Place wall shield over stud (Fig. 2). Attach fixture to stud with concealed set screw (Fig. 3), which draws three pieces together.

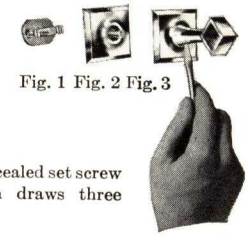


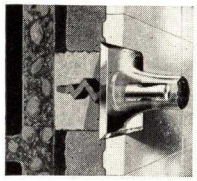
Fig. 1 Fig. 2 Fig. 3

SPRING LIP SHELF BRACKET

(Patent 1779236)

Front spring lip sets against edge of glass shelf holding it rigidly in place under rear lip.

ANKER-IN (SA) TYPE PLATE

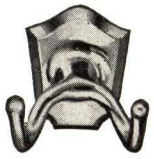


Installing Directions

Cut hold in wall ¾″ in diameter 1½″ deep for short anchor plate, used on tile or marble walls, and 2½″ deep for long anchor plates used on cement, plaster or glass walls. Fill hole with plaster of paris, placing some on anchor, and insert with screw holes level horizontally. Hold until set—a few seconds.

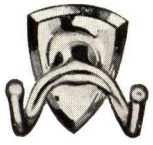
Important: Fixtures should not be put on plates for at least one hour or preferably after room is decorated and ready for occupancy.

C-8-H



C-8-M

C-8-T



C-8-F

TUMBLER HOLDER
C-801-Y $3.00

TOOTH BRUSH HOLDER
C-813-Y $2.00

TUMBLER AND TOOTH BRUSH HOLDER
C-815-Y $2.40

METAL SOAP HOLDER
C-717-Y $2.20

SINGLE HOOK
C-4-Y $1.05

DOUBLE HOOK
C-8-Y $1.40

C-704-Y
SOAP HOLDER
Dish size, 6¼x5x2″
Crystal.....**$3.55**
Black..... **3.75**
For drain hole,add **.50**

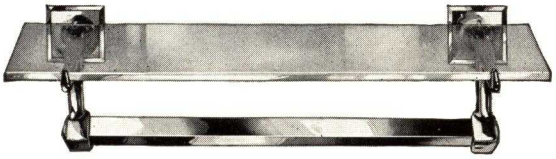
C-715-Y
SOAP HOLDER
Dish size, 7¼x5¾x2″
Crystal.....**$4.15**
Black..... **4.25**
For drain hole, add .. **.50**

THESE TYTESET ACCESSORIES CAN ALSO BE FURNISHED IN THE DESIGNS ILLUSTRATED AT THE LEFT, AT THE SAME PRICES.

IMPORTANT—USE PROPER SUFFIX LETTER AFTER CATALOGUE NUMBER.

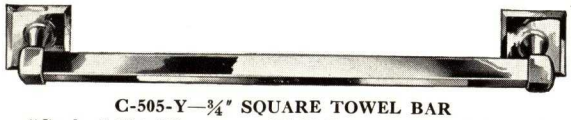
C-600-Y—¼x5″ CRYSTAL OR BLACK GLASS SHELF
(Spring Brackets, Patent 1779236)

Crystal Shelf.....	18″	**$5.10**	24″	**$5.30**	30″ **$5.70**
Black Shelf.....	18″	**6.50**	24″	**7.30**	30″ **8.30**



C-614-Y ¼x5″ CRYSTAL SHELF and ¾″ SQUARE METAL TOWEL BAR
(Spring Brackets, Patent 1779236)

Length Shelf.....	18″	24″	30″
Length Bar.....	14″	18″	24″
Price.....	**$8.60**	**$9.30**	**$10.00**



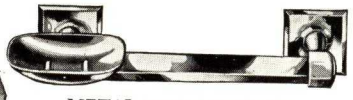
C-505-Y—¾″ SQUARE TOWEL BAR

"Crodon" Metal Bar.....	18″	**$3.80**	24″	**$4.20**	30″ **$4.60**
Crystal Drawn Glass Bar...	18″	**4.70**	24″	**5.20**	30″ **5.60**
Black Drawn Glass Bar.....	18″	**4.90**	24″	**5.40**	30″ **5.80**

C-525-F—⅞″ DIA. TOWEL BAR
Projection, 3⅝″

"Crodon" Metal Bar.....	18″	**$3.80**	24″	**$4.10**	30″ **$4.40**
Crystal Glass Bar.....	18″	**3.80**	24″	**4.10**	30″ **4.40**
Black Glass Bar.....	18″	**4.35**	24″	**4.70**	30″ **5.00**

SWING TOWEL BAR
Bars, ⅜x12¼″ **C-540-Y—$5.30**



METAL SOAP HOLDER AND ¾″ SQUARE GRAB BAR
Soap at right if specified
C-C Posts, 9″ **C-730-Y—$4.50**

¾x9″ SQUARE METAL GRAB BAR
C-512-Y—$3.20

C-523-F—⅞″ DIA. x 9″ GRAB BAR

"Crodon" Brass Bar.....	**$3.45**
Crystal Glass Bar.....	**3.45**
Black Glass Bar.....	**3.85**

METAL SOAP HOLDER
Dish size, 6x3½x1″ **C-711-Y—$4.00**

C-859-Y—PAPER HOLDER
C-C of Posts, 6″

Wooden Roller.....	**$2.90**
Metal Roller.....	**3.70**

HOEGGER Forged Brass Bathroom Accessories HOEGGER

C-600-S—⅜x5″ Crystal or Black Glass or Stainless Steel Shelf
Spring Brackets, (Patent 1779236) Wall flange, 2¼″; Projection, 5¾″

Crystal Shelf	18″	$ 9.15	24″	$10.50	30″	$11.90	36″ $13.20
Black Shelf	18″	10.10	24″	11.70	30″	13.40	36″ 15.10
Stainless Steel	18″	11.05	24″	12.85	30″	14.70	36″ 17.20

C-602-S—5/16x5″ Crystal or Black Glass Shelf

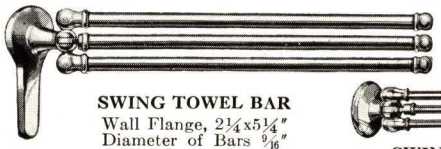
Crystal Shelf	18″	$6.30	24″	$6.50	30″	$6.90
Black Shelf	18″	7.70	24″	8.50	30″	9.50

C-507-S—1″ ROUND TOWEL BAR
Wall flange, 2¼″; Projection, 3¼″

"Crodon" Metal Bar	18″	$5.40	24″	$5.85	30″	$6.25	36″	$6.65
Crystal Glass Bar	18″	5.40	24″	5.85	30″	6.25	36″	6.65
Black Glass Bar	18″	5.85	24″	6.45	30″	7.00	36″	7.55

C-506-S—⅞″ SQUARE POLISHED CUT GLASS TOWEL BAR
Wall flange, 2¼″; Projection, 3½″

"Crodon" Metal Bar	18″	$6.00	24″	$ 6.60	30″	$ 7.20	36″	$ 7.80
Crystal Glass Bar	18″	8.70	24″	10.20	30″	11.70	36″	13.20
Black Glass Bar	18″	8.70	24″	10.20	30″	11.70	36″	13.20

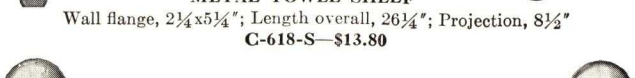


SWING TOWEL BAR
Wall Flange, 2¼x5¼″
Diameter of Bars 9/16″
C-534-S—16″ overall **$8.00**
C-535-S—20″ overall **9.00**

SWING TOWEL BAR
Wall flange, 2¼″
Length, 12″; Dia. of bars, ⅜″
C-540-S—$5.70

CLOTHES HANGER PIN
(Exposed Mounting Screws)
Wall Flange, 2¼x5¼″
Projection, 12″
C-380—$2.50

ROLL PAPER HOLDER
Wall flange, 2¼″; Width, 8½″
C-C of Posts, 6½″
C-850-S—$5.00



Solid Brass Guard Rail for 5″ Glass Towel Shelves
C-612 (Crodon)—18″ **$3.10**, 24″ **$3.30**, 30″ **$3.50**, 36″ **$3.70**

METAL TOWEL SHELF
Wall flange, 2¼x5¼″; Length overall, 26¼″; Projection, 8½″
C-618-S—$13.80

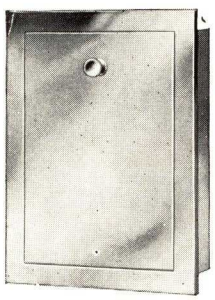
C-510-S—⅜x¾″ RECTANGULAR ALL METAL TOWEL BAR
(U. S. Patent 1773815)
Wall flange, 2¼″; Projection, 3″
"Crodon", 18″ **$3.90**, 24″ **$4.30**, 30″ **$4.70**

C-530—⅜x¾″ METAL TOWEL BAR
Wall flange, ¾x2″; Projection, 2½″
12″ **$1.40**, 18″ **$1.70**, 24″ **$2.25**, 30″ **$2.70**

C-515-S—ROLLER TOWEL BAR—$7.00
Wall flange, 2¼″; Length overall, 21½″; Projection, 4¼″

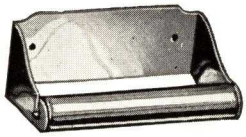
C-518-S—1½″ GRAB BAR
Wall flange, 3″; Projection, 3½″

"Crodon" Metal Bar	9″	$ 8.35	12″	$ 8.65	18″	$ 9.20	24″	$ 9.80
Crystal Glass Bar	9″	11.10	12″	12.30	18″	14.70	24″	17.10
Black Glass Bar	9″	11.55	12″	12.90	18″	15.60	24″	18.30

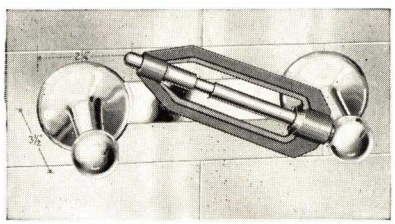


RECESS TOILET PAPER BOX
Chromium Plated Brass
Use 5x7″ sheet paper
Exact Opening:
5⅞″ Wide, 8⅛″ High
2⅜″ Deep
C-183-S—$18.00

RECESS TOILET PAPER BOX
Wyco on Steel
For 6x8″ sheet paper
Exact Opening:
7⅝″ Wide, 9¾″ High
3″ Deep
W-854—$12.00



ROLL PAPER HOLDER
Width, 5¼″
C-853—Metal Roller **$2.80**
C-858—Wooden Roller **2.00**



TENSION SPRING ROLL TOILET PAPER HOLDER
(Patent 1665739)
Holder shown in open position
Wall flange, 2¼″; Width, 8″
C-862-S—$5.75

TENSION SPRING ROLL PAPER TOWEL HOLDER
Wall flange, 2¼″; Width, 15″
Made with same features as C-862-S above.
Takes standard rolls of paper towels
C-863-S—$10.00

C-516-S—1″ GRAB BAR
Wall flange, 2¼″; Projection, 2¾″

"Crodon" Metal Bar	6″	$4.15,	9″	$4.40				
Crystal Glass Bar	6″	4.15,	9″	4.40				
Black Glass Bar	6″	4.30,	9″	4.60				

TOWEL PIN
Wall flange, 2¼″
Flange hook, ⅞″
Height, 4¼″
Projection, 3¾″
C-514-S—$2.70

C-551—TOWEL HORSE—$24.75
Length 24″, Height 30″, Width 7″

HOEGGER Forged Brass Bathroom Accessories HOEGGER

TUMBLER HOLDER
Wall flange, 2¼″
Width, 3¼″
Height, 3¾″
Projection, 4″
C-801-S—$3.75

STROP OR BAG HOOK
Projection, 1¼″
Height, 1″
C-2-S—$0.70

STROP OR BAG HOOK
Wall flange, 2¼″
Projection, 2¼″
C-4-S—$1.35

ROBE OR BAG HOOK
Wall flange, 2¼″
Projection, 3¾″
C-10-S—$1.90

DOUBLE ROBE HOOK
Wall flange, 2¼″
Width, 3″
Projection, 2¾″
C-8-S—$2.40

COAT AND HAT HOOK
Wall flange, 2¼″
Projection, 4″
Height, 3½″
C-13-S—$2.40

COAT AND HAT HOOK
Wall flange, 1½x1¾″
Height, 3¾″
Projection, 3″
Exposed Screw only
C-6—$0.70

TOOTHBRUSH HOLDER
Wall flange, 2¼″
Width, 3″
Projection, 2¼″
C-841-S—$2.50

STROP HOOK
Flange, 1½″ dia.
Projection, 1″
Exposed Screw only
C-11—$0.50

ROBE HOOK
Wall flange, 1½x1½″
Projection, 2″
Exposed Screw only
C-10—$0.50

COAT AND HAT HOOK
Wall flange, 2x1¼″
Height, 2¾″
Projection, 2¼″
Exposed screw only
C-9—$0.70

TRIPLE ROBE HOOK
Width, 3½″
Height, 4¼″
Projection, 3″
Exposed Screw only
C-12—$1.00

DOOR STOP AND COAT HOOK
Wall flange, 2¼″
Projection, 3¼″
Height, 3¼″
C-395-S—$1.90

TOOTHBRUSH HOLDER
Wall flange, 2¼″
Height, 2¾″
Projection, 4″
C-813-S—$2.75

C-704-S—SOAP HOLDER
Wall flange, 2¼″; Projection, 5¾″
Dish size, 6¼x5x2″
Crystal—**$4.60**
Black— **4.80**
For drain hole—add $0.50

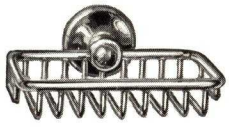
C-715-S—TUB SOAP HOLDER
Wall flange, 2¼″; Projection, 6½″
Dish size, 7¼x5¾x2″
Crystal—**$5.50**
Black— **5.80**
For drain hole—add $0.50

CUT GLASS CRYSTAL TUMBLER
92—$1.40

CUT GLASS BLACK TUMBLER
94—$2.00

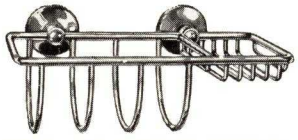
METAL SOAP DISH
Rubber Tipped Feet
Size, 4¼x3⅛x1⅜″
C-707—$2.95

METAL SOAP HOLDER
Wall flange, 2¼″
Width, 4½″
Projection, 4″
Dish size, 4½ x 2¾ x 1¼″
C-717-S—$3.50



SOAP HOLDER
Wall flange, 2¼″
Projection, 4¾″
Dish size, 6x3½x1″
C-711-S—$4.80

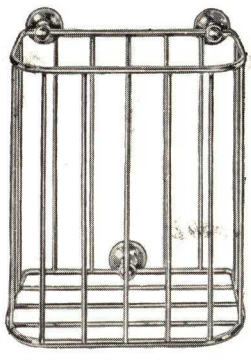
SOAP HOLDER
(Same as above only to fit over rim of tub)
C-708—$4.30



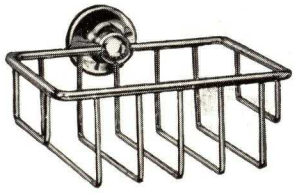
SOAP AND SPONGE HOLDER
Wall flange, 2¼″; Projection, 6″
Height, 4¼″
C-725-S—$9.20

SOAP AND SPONGE HOLDER
(Same as above only to fit over rim of tub)
C-712—$8.00

SOILED TOWEL BASKET
Solid Bottom 11″ Dia.
Top 1″ Dia., Height 18″
C-554—$23.50



SOILED TOWEL BASKET
Width 12¾″; Height 16″
Projection 7½″
C-553-S—$23.00



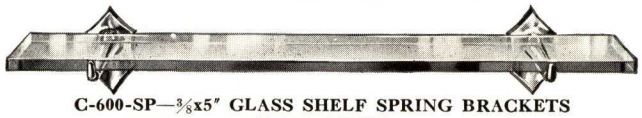
SPONGE HOLDER
Wall flange, 2¼″; Projection, 8″
Size, 7x7x3¼″
C-702-S—$7.65

SPONGE HOLDER
(Same as above only to fit over rim of tub)
C-709—$7.00

"LATHURN" LATHER
Leakproof Soap Dispenser
Dispenses Creamy Lather from Any Liquid Soap
C-720—$6.50

HOEGGER "Parfait" Forged Brass Accessories HOEGGER

A beautiful and distinctive design by HOEGGER which may be matched with cabinets and lighting fixtures, and which will add charm to the most luxurious bathroom.



C-600-SP—⅜x5" GLASS SHELF SPRING BRACKETS
(Patent 1779236)
Wall flange, 2x3½"; Projection, 5½"

Crystal Glass Shelf	18"	$10.75	24"	$12.10	30"	$13.50	36" $14.80
Black Glass Shelf	18"	11.70	24"	13.30	30"	15.00	36" 16.70
Stainless Steel	18"	12.65	24"	14.45	30"	16.30	36" 18.80

C-4-SP—$2.25
STROP OR BAG HOOK
Wall flange, 2x3½"
Projection, 2"

C-8-SP—$3.20
DOUBLE ROBE HOOK
Wall flange, 2x3½"
Width, 3¼"
Projection, 3"

C-10-SP—$2.70
STROP OR BAG HOOK
Wall flange, 2x3½"
Projection, 2⅞"

C-841-SP—$3.30
TOOTHBRUSH HOLDER
Wall flange, 2x3½"
Width, 2½"
Projection, 3⅜"

C-813-SP—$3.55
TOOTHBRUSH HOLDER
Wall flange, 2x3½"
Width, 2⅜"
Projection, 3⅞"

C-801-SP—$5.00
TUMBLER HOLDER
Wall flange, 2x3½"
Width, 3"
Height, 4¼"
Projection, 4"

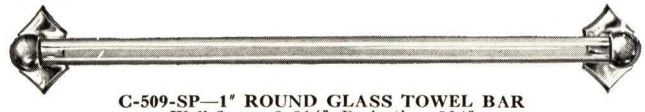
C-704-SP—SMALL SOAP DISH
Wall flange, 2x3½"; Projection, 6"
Dish size, 6¼x5x2"
Crystal Dish **$6.00**, Black Dish **$6.20**
With drain hole, add $0.50

C-715-SP—LARGE SOAP DISH
Wall flange, 2x3½"; Projection, 6¾"
Dish size, 7¼x5¾x2"
Crystal Dish **$7.00**, Black Dish **$7.20**
With drain hole, add $0.50

C-717-SP.....$5.00
ALL-METAL SOAPHOLDER
Wall flange, 2x3½"
Width, 4½"
Projection, 3¾"
With drain holes—same price

C-506-SP—⅞" SQUARE POLISHED CUT GLASS TOWEL BAR
Wall flange, 2x3½"; Projection, 3¾"

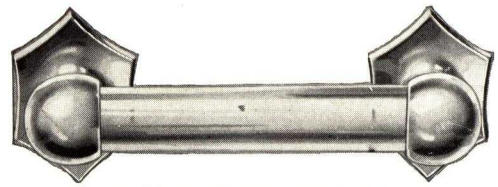
Crodon Metal Bar	18"	$ 7.60	24"	$ 8.20	30"	$ 8.80	36" $ 9.40
Crystal Glass Bar	18"	10.30	24"	11.80	30"	13.30	36" 14.80
Black Glass Bar	18"	10.30	24"	11.80	30"	13.30	36" 14.80



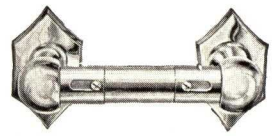
C-509-SP—1" ROUND GLASS TOWEL BAR
Wall flange, 2x3½"; Projection, 3¾"

Crodon Metal Bar	18"	$6.60	24"	$7.05	30"	$7.45	36" $7.85
Crystal Glass Bar	18"	6.60	24"	7.05	30"	7.45	36" 7.85
Black Glass Bar	18"	7.05	24"	7.65	30"	8.20	36" 8.75

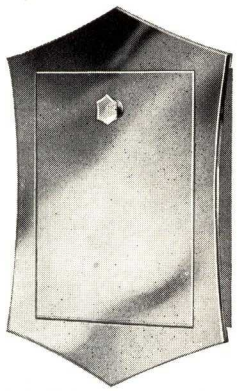
C-516-SP.....$6.00
1" ALL-METAL GRAB BAR
Center to center of brackets, 9"; Wall flange, 2x3½"; Projection, 2½"; Width, 11"



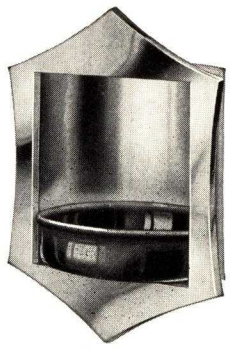
C-513-SP—1½"x9" GRAB BAR
Center to center of brackets, 9"; Wall flange, 2⅞x4"; Projection, 3½"
Width, 12"
Crodon Metal Bar **$9.25**, Crystal Glass Bar **$12.00**
Black Glass Bar **$12.45**



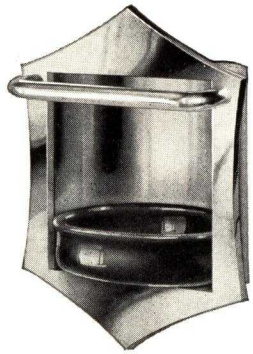
C-856-SP.....$6.60
TOILET PAPER HOLDER
Takes standard 5" roll toilet paper
Center to center of brackets, 6"
Wall flange, 2x3½"
Width, 7½"



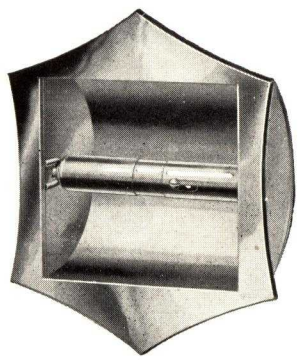
C-173-SP.....$18.40
"PARFAIT" RECESS TOILET PAPER BOX
Use 5x7 sheet paper
Width, 7¼"; Height, 11⅝"
Depth, 2¾"
Exact Opening
5⅞" Wide; 8⅛" Hh
2½" Deep



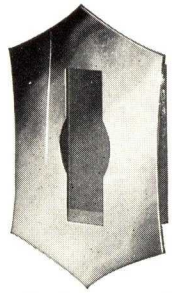
C-174-SP.....$13.30
"PARFAIT" RECESS SOAP OR TUMBLER HOLDER
Width, 7⅞"; Height, 10⅛"
Depth, 3½"
Exact Opening:
6⅛" Wide; 5⅞" High
3⅜" Deep
Black or Crystal Dish



C-175-SP.....$15.40
"PARFAIT" RECESS SOAP HOLDER AND GRAB BAR
Width, 7⅞"; Height, 10⅛"
Depth, 3½"
Projection, 2¼"
Exact Opening:
6⅛" Wide; 5⅞" High; 3⅜" Deep
Black or Crystal Dish



C-172-SP.....$14.20
"PARFAIT" TOILET PAPER HOLDER
Takes Standard 5" Roll Toilet Paper
Width, 7⅞"; Height, 10⅛"
Depth, 3½"
Exact Opening:
5⅞" Wide; 6⅛" High; 3⅜" Deep



C-171-SP.....$8.50
"PARFAIT" RECESS TOILET PAPER BOX
Takes Folded Paper
Width, 5¼"; Height 8"
Depth, 2"
Exact Opening
4¼" Wide, 5¼" High
1⅞" Deep

DOUBLE CURTAIN TRAVERSE RODS

SHOWERS
DRAPERIES

(Patent No. 2049061—Other Patents Pending)

NEW—DUPLEX OVERLAPPING CURTAIN RODS AND VERTICAL WALL CURTAIN CHANNELS

For Watertight Shower Compartments

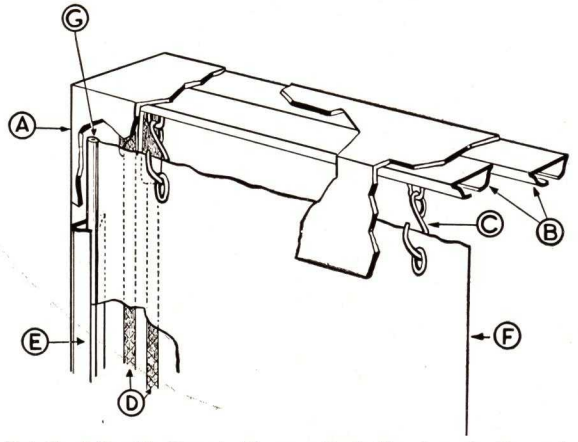
The curtain is securely fastened against the side wall by a turned welt in curtain edge inserted into a vertical wall channel as illustrated. Makes a watertight joint and splash proof compartment.

Tracks are chromium plated brass. They are concealed by a metal apron extending the full width of the compartment. Securely supported by adjustable bracket at each end.

Curtains are suspended by hook-carriers sliding in the tracks. They are operated by pull cords or manually. Curtains overlap 6 inches in center. Pull cords are conveniently located inside of enclosure. Curtains are easily removed for laundering.

These Double Curtain Traverse Rods are attractive and inconspicuous. A slight pull operates the heaviest shower curtain.

A—Metal Angle—Supports and conceals track and hooks.
B—Double Track—Permits curtains to overlap.
C—Curtain Hooks—Operated by pull cord "D."
D—Pull Cord—Opens and closes curtains.
E—Vertical Wall Channel—Holds entire edge of curtain tightly to wall.
F—Shower Curtain—With 5/16" welt at edge—inserted in vertical wall channel "E."
G—Cotton Cord—Sewed in vertical edge of curtain to form 5/16" welt—inserted in vertical channel.



Details of Double Curtain Traverse Rods Showing the Concealing Apron and Method of Holding the Shower Curtain Tightly Against the Wall. Also the Operation of the Pull Cords from Inside of the Shower Compartment.

RECESS SHOWER CURTAIN ROD

Chromium Plated Brass—Complete with Adjustable End Brackets and Hooks.

C-346—66"—With Pull Cord.....**$23.50**
C-347—66"—No Pull Cord.....**20.00**

Use two curtains each 4½ ft. wide. Right side of one and left side of other beaded for attaching to C-331 Channel.

CORNER SHOWER CURTAIN ROD

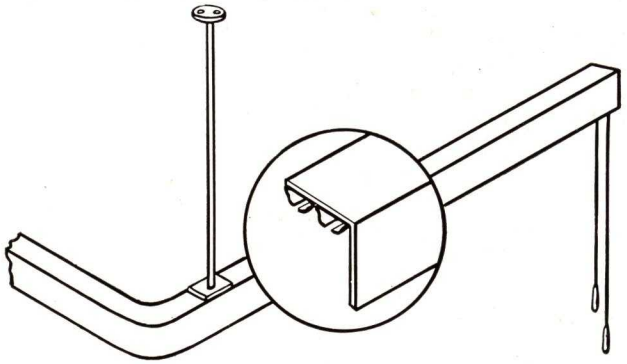
Left or Right—Chromium Plated Brass—Complete with End Brackets, Ceiling Bracket and Hooks.

C-348—25x66"—With Pull Cord.....**$34.50**
C-349—25x66"—No Pull Cord.....**30.75**

Use two curtains each 6 ft. wide. Right side of one and left side of other beaded for attaching to C-331 Channel.

VERTICAL WALL CHANNEL "E"

C-331—Chromium Plated Brass.....**$0.75** ft.
C-335—Aluminum.....**.25** ft.
C-334—Hold Back Chain and Hook.....**1.00** ea.

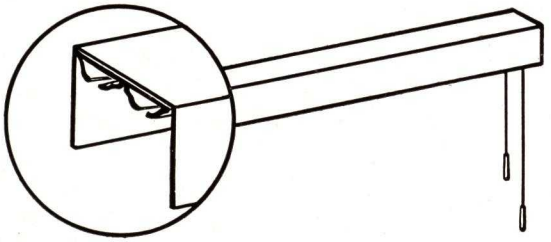


Method of Supporting Curved Traverse Rod from the Ceiling. Also showing the Concealing Apron.

DRAPERY RODS

Hoegger Double Traverse Drapery Rods are smaller and neater than the customary type of drapery device for open or overlapping curtains. They fit any window and are inconspicuous. Operate with or without pull cords.

For curved bay windows they are ideal, as we make specially curved tracks to suit each condition. They are mounted on the ceiling by means of special supports and are fastened to side walls by adjustable brackets. Hooks are completely enclosed.



Drapery Rod with Hooks Entirely Concealed.

DOOR DRAPERY ROD

C-320—Double Track with Double Apron.....**$3.30** ft.
C-321—End Brackets with Pull Cord.....**6.00** pr.
C-305—Hooks—Used, without Pull Cord.....**.06** ea.
C-304—Hooks—Used, with Pull Cord.....**.12** ea.

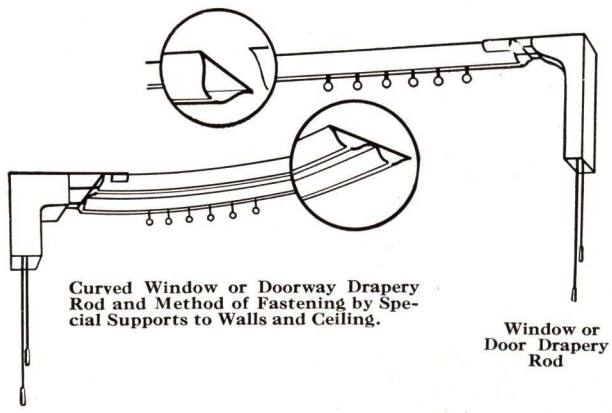
Note: Without pull cords—no end brackets required.

WINDOW OR DOOR DRAPERY ROD

316—Aluminum Track.....**$0.25** ft.
C-317—Chromium Plated Brass Track.....**.75** ft.
C-318—Adj. End Brackets, Inside Mounting, No Pull Cord.....**.30** pr.
C-319—Adj. End Brackets, Surface Mounting, No Pull Cord.....**.50** pr.
C-323—Adj. End Brackets, Inside Mounting, with Pull Cord.....**2.30** pr.
C-324—Adj. End Brackets, Surface Mounting, with Pull Cord.....**2.50** pr.
C-325—Ceiling Bracket.....**.15** ea.
C-305—Hooks—Used, without Pull Cord.....**.06** ea.
C-304—Hooks—Used, with Pull Cord.....**.12** ea.

CURVED WINDOW OR DOORWAY DRAPERY ROD

C-341—Double Chromium Plated Brass Track.....**$1.75** ft.
C-342—End Bracket—No Pull Cord.....**1.00** pr.
C-343—End Bracket—With Pull Cord.....**6.00** pr.
C-344—Ceiling Bracket.....**.25** ea.
C-305—Hooks—Used, without Pull Cord.....**.06** ea.
C-304—Hooks—Used, with Pull Cord.....**.12** ea.



Curved Window or Doorway Drapery Rod and Method of Fastening by Special Supports to Walls and Ceiling.

Window or Door Drapery Rod

Bathroom Accessories

by

HOEGGER

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Lawco

BATHROOM CABINETS

WALL MIRRORS • ACCESS UNITS • BATHROOM ACCESSORIES

THE F. H. LAWSON COMPANY • CINCINNATI

CABINET DIVISION

CHICAGO • BOSTON • NEW YORK • MONTREAL

MINNEAPOLIS • WASHINGTON • PHILADELPHIA

1938

Lawco Cabinets ARE BUILT FOR TODAY ... and tomorrow!

WHEN you study the classic designing of Lawco Cabinets . . . when you consider the world of experience a century has given their fabricators . . . when you examine their unique refinements, the quality of their materials and the workmanship that is truly craftsmanship — you'll understand why far-seeing architects are specifying these Lawco creations for interiors that anticipate the trends of tomorrow.

SINCE 1816 . . . for more than a century . . . The F. H. Lawson Company has pioneered in fabricating sheet metal specialties of unusual merit. It is today one of the hundred oldest concerns in the United States. Its tradition, its reputation, its appreciation of fine craftsmanship have been handed down from generation to generation. Today Lawson Products reflect the same business integrity that inspired the early founders.

AND THROUGH ALL THESE YEARS of constant change and improvement, of new ideas and new designs, one thing has remained fixed: QUALITY. Quality of design, of material, of manufacture . . . keeping untarnished the enviable Lawson reputation a century has succeeded in building. The products in this catalog are guaranteed to be exactly as represented: each unit is constructed of the finest materials compatible with the purchase price.

THE STEEL . . . especially selected and rigidly inspected. Both heavy and medium gauges are stretcher-leveled to remove even the slightest buckles and twists.

THE FINISH . . . Lawco's famous time-defying **"WHITECAP."** The steel is first thoroughly cleansed of stains and impurities, and then rust-proofed by a patented, electrolytic process. The cabinets are then given a base coat of red oxide, which is baked at a high temperature. Two separate coats of the finest quality, pure-white lacquer are then applied. *Result:* the "Whitecap" finish — guaranteed not only to resist rust, and stain (from iodine, etc.) but to remain free from peeling, chipping and cracking under normal usage. This finish is supplied on all DE LUXE CABINETS.

THE MIRRORS . . . Except where otherwise noted, the mirrors of Lawco Cabinets are made of *plate glass* and comply fully with the requirements of the United States Bureau of Standards. Each mirror is carefully inspected before shipping. And to give Lawco Mirrors *extra* years of service, their silver backing is protected by a coating of copper. This copper prevents deterioration of the silver and makes possible our rigid guarantee against silver spoilage. The copper (in solution) is *sprayed on* — to eliminate any possibility of pinholes, air bubbles or moisture spots. *You can depend on Lawco Mirrors!*

SERVICE TO ARCHITECTS

Our engineering department is constantly working with architects and contractors who are planning new work and renovating old structures. It likewise supplies blue prints upon request. These services, of course, are without obligation. We invite inquiries.

In addition to our regular line, we are equipped to handle special orders from architects' drawings — providing the quantity of units involved justifies the cost of the production run.

The prices mentioned in this catalog are only approximate. They are shown merely to assist the architect, contractor or home owner in determining the *relative values* of the various products. These prices *should not* be used for quotation.

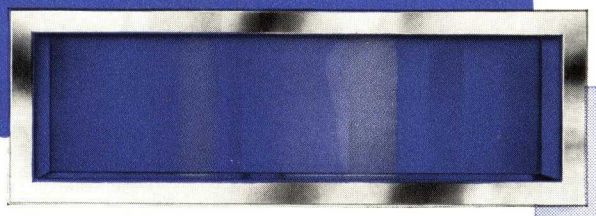
INSTALLATIONS

Lawco Cabinets, Mirrors, Access Units and Accessories are specified by the nation's leading architects. Prominent installations include: the Waldorf-Astoria Hotel and the Empire State Building, both in New York . . . the Dayton (Ohio) Biltmore . . . Hotel Statler, Boston . . . Officers Quarters, Fort Benning, Ga. . . . Bachelor Officers Quarters, United States Military Academy, West Point, N. Y. In fact, Lawson Products are installed in practically every city in the country.

THE F. H. LAWSON COMPANY
Cabinet Division
CINCINNATI • OHIO

ROTUNDA
Nos. 700, 705, 710

TUBULAR LIGHT
No. 333



RECESS SHELF
No. 488

Lawco ROTUNDA

De LUXE CABINET with ROUND MIRROR

THIS handsome cabinet meets the present vogue for round mirrors. It is designed for bathrooms and dressing rooms in the ultra-modern or modern classic styles. Although pictured with the mirror decorated in a restrained motif (No. 705), the Rotunda is also furnished with a plain mirror (No. 700), and with a plain mirror and a narrow chromium frame (No. 710).

TUBULAR WALL BRACKETS

The striking Wall Brackets shown (No. 333) . . . designed for use with any Lawco Cabinet . . . are particularly effective with the Rotunda. These units provide efficient, glareless lighting — sufficient to illuminate the entire bathroom. Price includes: frosted candles, set screws and switch . . . but not the required 40-watt T-8 bulb, easily obtainable.

De LUXE RECESS SHELF

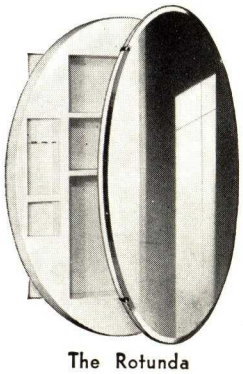
Lined with beautifully colored mirrors, this Recess Shelf is a fitting companion to the Rotunda . . . and especially desirable in dressing rooms. Mirror interiors in blue, green, rose, gun-metal or silver. Face flange chromium plated.

TWO IMPORTANT FEATURES

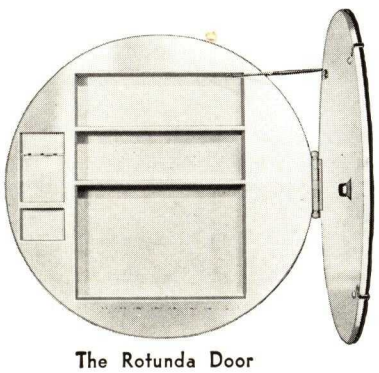
Due to its ingenious, mechanically correct construction the Rotunda has two important features:

As shown below, its door is easily opened with one hand to a full 90° angle. No possibility of the door striking the wall when opening.

The second big feature of the Rotunda is its rectangular-shaped box. Thus, this cabinet can be set in the wall with the same ease as a rectangular model. It is no wonder that the Rotunda is gaining such wide popularity!



The Rotunda with Plain Mirror

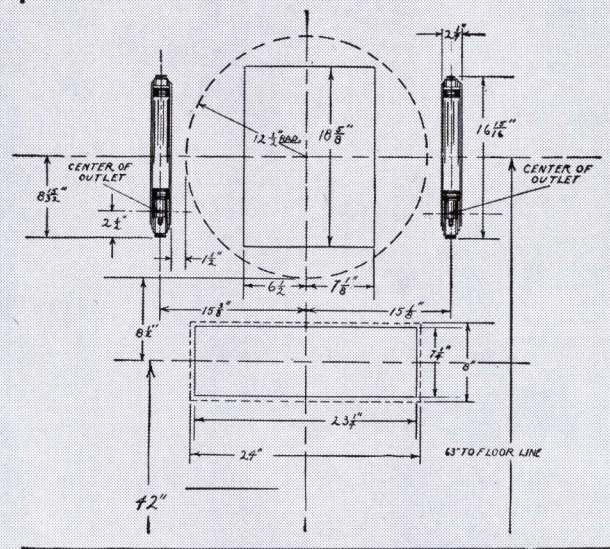


The Rotunda Door opens to 90° angle

Construction

Heavy gauge stretcher-level steel . . . Lawco guaranteed "Whitecap" *ELECTRO-RUSTPROOFED* lacquer finish *over baked red oxide prime coat* . . . plate glass mirror with 5-year silver-spoil guarantee . . . "Jiffy" ratchet mirror clips . . . heavy bulb-edge glass shelf cover . . . toothbrush compartment . . . razor blade drop . . . bullet door catch . . . sturdy chromium-finish door stop.

The Rotunda is also supplied as a wall mirror — consisting of only mirror and door. In the back of the door, concealed hanger-slots are provided. Price of wall mirror is three-quarters that of complete cabinet.



Type of Mirror	Number	Mirror, In.	Wall Opening, In.	Shelves	Shipping Wgt., lb.
Engraved, frameless..	705	25 dia.	13 5/8 x 18 5/8 x 3 3/8	2	42
Plain, frameless.....	700				42
Plain, framed.....	710				45

WALL BRACKETS (No. 333): 2¼ x 17 in.; Candle, 12 in. high.
RECESS SHELF (No. 488): Overall, 24 x 8 in.; Wall Opening, 23⅜ x 7⅜ x 4 in.

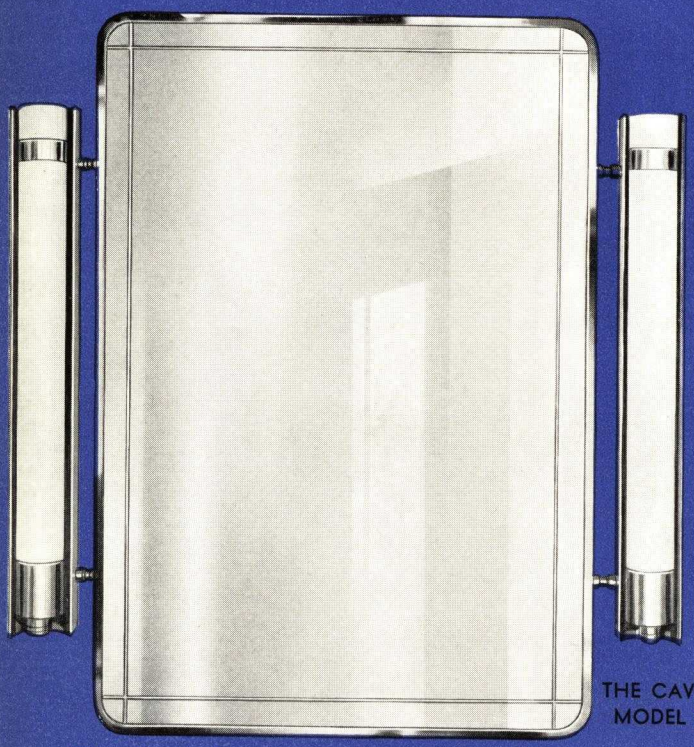
LIST PRICES of the Rotunda Cabinets range approximately from $31.00 to $35.00. The Wall Brackets, approx. $16.50 per pair. The Recess Shelf, approx. $30.00 each.

Lawco DeLUXE LIGHTED

FOUR OUTSTANDING CABINETS from the famous Lawco DeLuxe line. All are made on the same body . . . are equipped with side lights, switch and convenience outlet. The lights are the popular tubular type . . . held by smartly styled cup and arm-and-ring brackets, chromium plated and securely fastened to a chromium plated reflecting light-well, which in turn is secured to the return flange of the cabinet. The cup holds the bakelite socket into which the light bulb is screwed; the arm and ring support the bulb.

THE CAVALIER

Model DRD . . . below. Same as the Florentine . . . except the mirror is rectangular and encased in a chromium frame with smoothly rounded corners. Its simple decoration — the crossed U-mitered lines — makes the Cavalier especially suitable for master bathrooms where a more restrained decoration is preferred.



THE CAVALIER
MODEL DRD

The list prices of the cabinets shown on these two pages range approximately from $56.00 to $61.00.

THE FLORENTINE

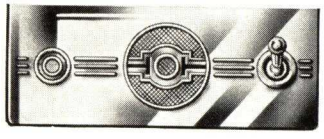
Model FLF. The "decorator" cabinet above . . . well proportioned in every detail . . . designed for the finest bathrooms. Its graceful scroll-top Venetian mirror is frameless and richly engraved in silver . . . in a delicate floral pattern.

Lawco Combination Switch and Convenience Unit

A new development . . . insuring easy access to both switch and outlet. Face of unit is chromium plated; *its back is flush with plaster line.* Only necessary to remove two half-pieces of tile . . . no cutting into plaster or studding.

This Combination comes attached to all Lawco DeLuxe and Pioneer Lighted Cabinets — unless specifications call for use with wall switch:

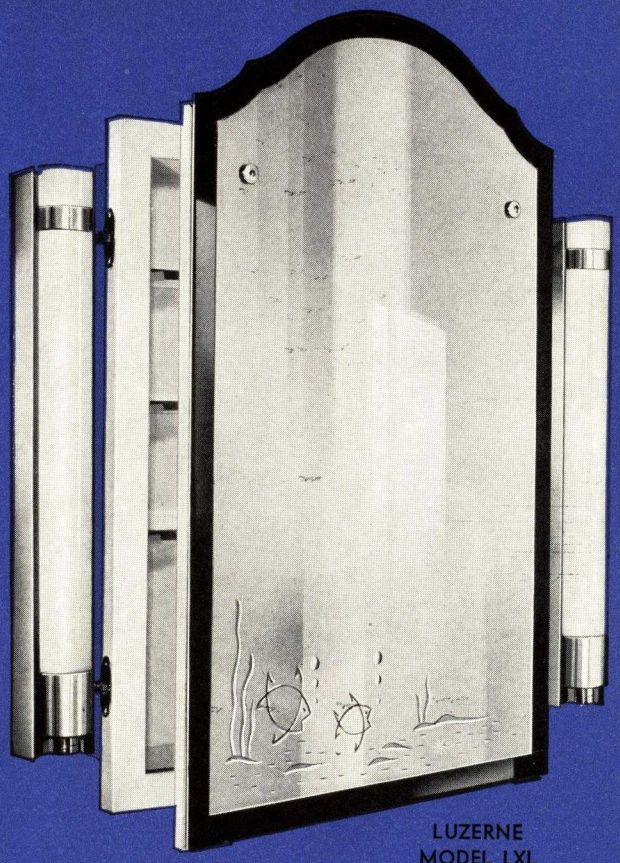
Dimensions: Face, 4⅜ x 2⅜ in. Depth of box, ⅞ in.



CABINETS

THE LUZERNE

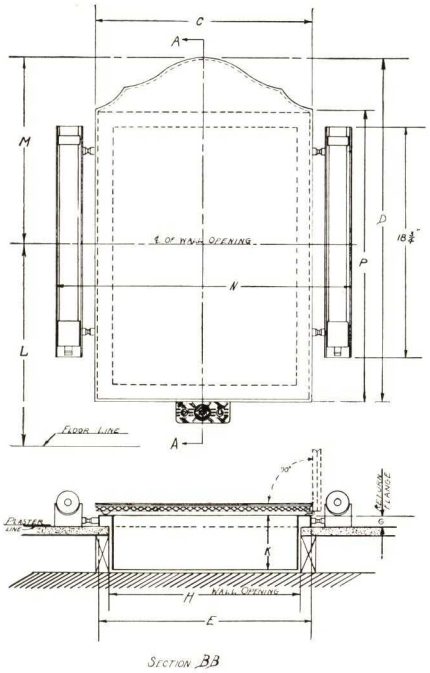
Model LXL . . . at right. The latest note in bathroom decoration. This cabinet has the same scroll-top Venetian mirror as the Florentine. Its decoration, however, consists of a marine design engraved in the lower left of the mirror . . . with the border painted in black. This border can also be supplied in colors to harmonize with surrounding tile (send tile sample or refer to number on accepted color chart).



LUZERNE
MODEL LXL

THE GENEVAN

Model GFG . . . above. Similar to the Cavalier shown on the opposite page . . . except the mirror of the Genevan is frameless and is held to the door by four chromium-finished mirror bolts.



Construction

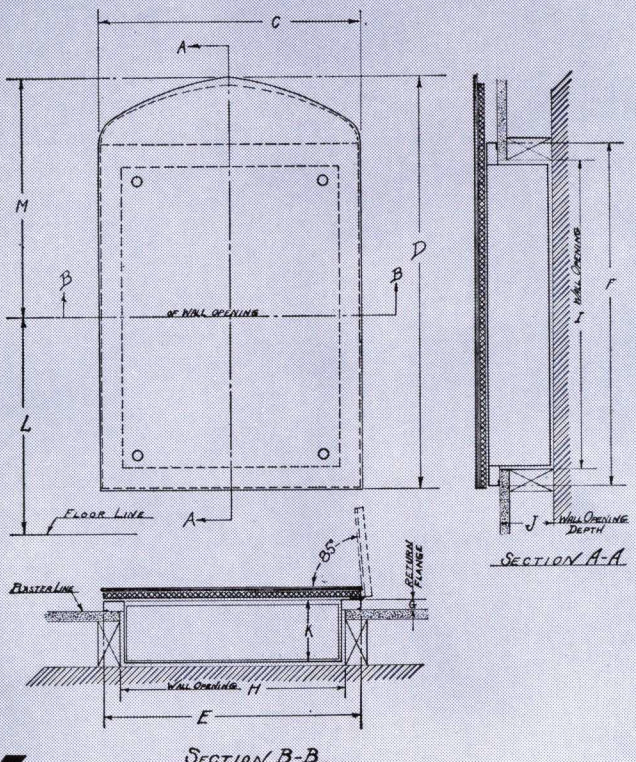
OF CABINETS ON BOTH PAGES

Heavy gauge stretcher-level steel . . . Lawco guaranteed "Whitecap" *Electro-Rustproofed* lacquer finish *over baked red oxide prime coat* . . . plate glass mirror with 5-year silver-spoil guarantee . . . heavy bulb-edge glass shelves . . . opal glass lower shelf cover . . . toothbrush holder . . . razor blade drop . . . bullet door catch . . . sturdy chromium-plated door stop . . . De Luxe shelf adjustment . . . chromium-plated piano hinge . . . wiring completely housed *and approved by Underwriters' Laboratories*. Removable door on framed models.

Cabinet	No.	Door, In.	Wall Opening, In.	Shelves	Shipping Wt., lb.
Florentine	FLF	18x30	15½x23¾x3½	4	70
Cavalier	DRD	18x28			
Luzerne	LXL	18x30			
Genevan	GFG	18x27			

Lawco De LUXE

ACROPOLIS
No. 1850



SIX exquisite cabinets of Lawson's finest line—the De-Luxe. Styled with patrician Gothic tops . . . built with the traditional Lawco guarantee of quality materials and quality workmanship . . . yet moderate in their price.

●

THE ACROPOLIS

No. 1850. An unusually pleasing interpretation of the Gothic-topped style. The mirror is enclosed in a narrow chromium frame . . . and has as its only decoration an engraved U-mitered line following the contour of the frame and accented in gold. (Silver line on request.) *One size only.*

●

Construction

OF CABINETS ON BOTH PAGES

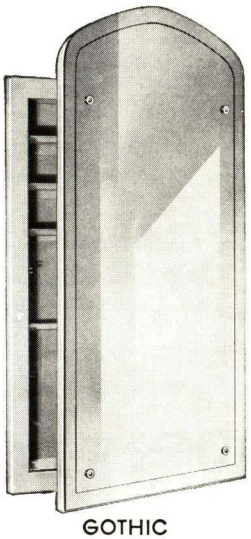
Heavy gauge stretcher-level steel . . . Lawco guaranteed "Whitecap" ELECTRO-RUSTPROOFED lacquer finish *over baked, red oxide prime coat* . . . plate glass mirror with *lifetime* silver-spoil guarantee . . . heavy bulb-edge glass shelves . . . opal glass bottom shelf cover . . . toothbrush holder . . . razor blade drop . . . bullet door catch . . . sturdy chromium door stop . . . DeLuxe shelf adjustment . . . chromium-plated piano hinge. Removable door.

●

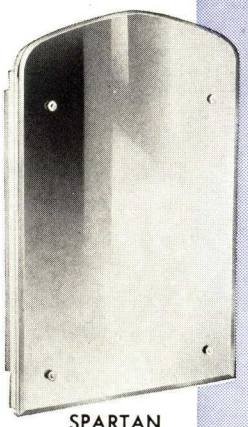
The list prices of Cabinets shown on these two pages range approximately from $37.00 to $64.00

Cabinet Number	C	D	E	F	G	H	I	J	K	L	M
1800 Series	18	28	17¾	23¼	¾	15¼	20¾	3½	4¼	63	16¼
1850 Series	18	28	17¾	23¼	¾	15¼	20¾	3½	4¼	63	16¼
1900 Series	20	36	19¾	30¾	¾	17½	28¼	3½	4¼	63	22

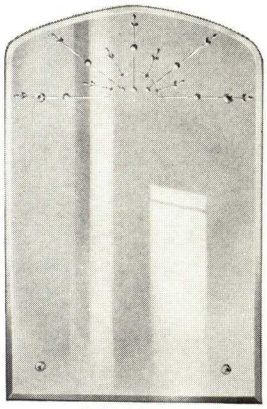
CABINETS



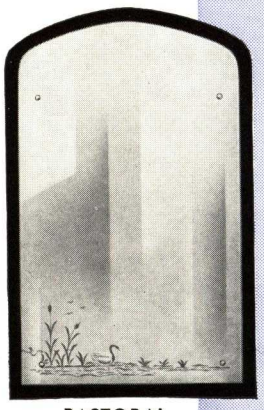
GOTHIC
Nos. 1800, 1900



SPARTAN
Nos. 1804, 1904



COLONIAL
Nos. 1803, 1903



PASTORAL
Nos. 1802, 1902

The Gothic-topped cabinets shown on this page have the same DeLuxe features as the Acropolis . . . except that their mirrors are *frameless* and held to the door by gold-plated mirror bolts. In addition, these frameless cabinets are obtainable in *two* convenient sizes . . . the larger, more roomy size being adequately dimensioned for large master bathrooms.

THE GOTHIC

Nos. 1800, 1900. With the same style of decoration as the Acropolis shown on the opposite page: a frameless mirror with engraved U-mitered line following the mirror's contour and accented in gold (in silver on request).

THE SPARTAN

Nos. 1804, 1904. A beveled edge mirror with the characteristic Gothic top but no engraving. Decidedly effective due to its uncompromised simplicity.

THE COLONIAL

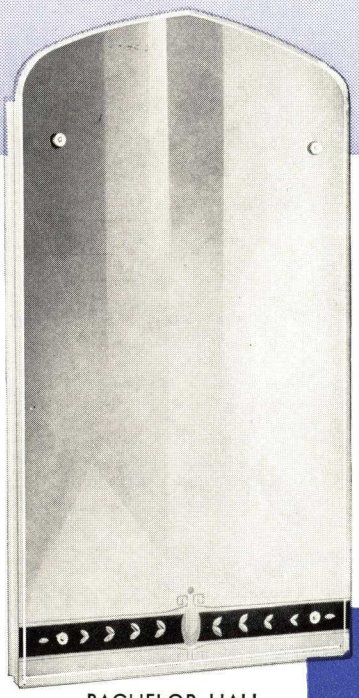
Nos. 1803, 1903. Simply but effectively engraved . . . especially designed for residences where the Colonial idea is carried into the bathroom design.

THE PASTORAL

Nos. 1802, 1902. An unusual mirror decoration . . . swan and waterlily engraved at the base of the mirror and accentuated in gold (in silver on request) . . . and mirror border painted black. Borders in other colors to harmonize with colored tile, however, can be obtained (send tile sample or refer to number on accepted color chart).

THE BACHELOR HALL

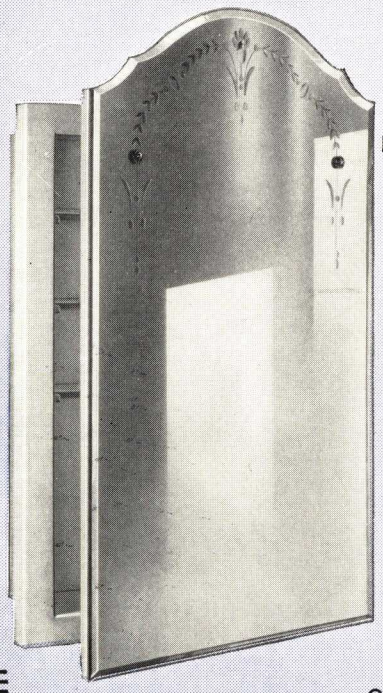
Nos. 1805, 1905. A new note in mirror decoration. A black stripe near the bottom of the cabinet is boldly outlined and studded in gold (in silver, if preferred). The stripe, however, can be furnished in other colors on request.



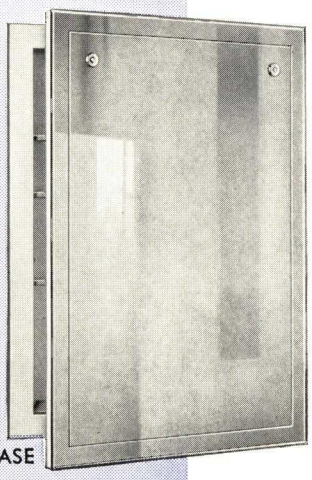
BACHELOR HALL
Nos. 1805, 1905

Cabinet	Number	Door, In.	Wall Opening, In.	Shelves	Shipping Wgt., lb.
Acropolis	1850	18 x 28	15¼ x 20¾ x 3½	3	45
Spartan	1804	18 x 28	15¼ x 20¾ x 3½	3	43
	1904	20 x 36	17½ x 28¼ x 3½	4	85
Gothic	1800	18 x 28	15¼ x 20¾ x 3½	3	43
	1900	20 x 36	17½ x 28¼ x 3½	4	85
Bachelor Hall	1805	18 x 28	15¼ x 20¾ x 3½	3	43
	1905	20 x 36	17½ x 28¼ x 3½	4	85
Colonial	1803	18 x 28	15¼ x 20¾ x 3½	3	43
	1903	20 x 36	17½ x 28¼ x 3½	4	85
Pastoral	1802	18 x 28	15¼ x 20¾ x 3½	3	43
	1902	20 x 36	17½ x 28¼ x 3½	4	85

Lawco De LUXE CABINETS



CAPITOL
Nos. 880, 885



CHEVY CHASE
No. 850

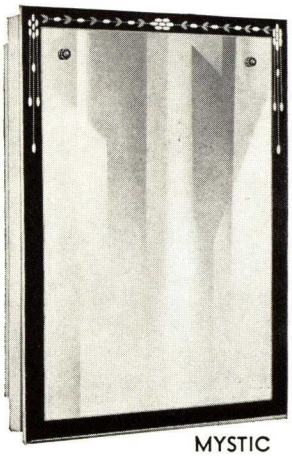
THE CAPITOL

Nos. 880, 885. A veritable leader in fine bathroom cabinets. Its mirror has a graceful scroll top and is engraved in silver . . . in either a rich floral design (designation "F") or a simple but effective mitered line (designation "M"). Two convenient sizes.

THE LAWCO CABINETS shown on this page . . . while moderate in price . . . are "quality" products in every detail. The mirror of each cabinet is plate glass of high quality . . . and is fastened to the door by chromium-finished mirror bolts and further secured by resting on two chromium-finished clips at the bottom of the door. The hardware is sturdily built and finished in chromium.

THE CHEVY CHASE

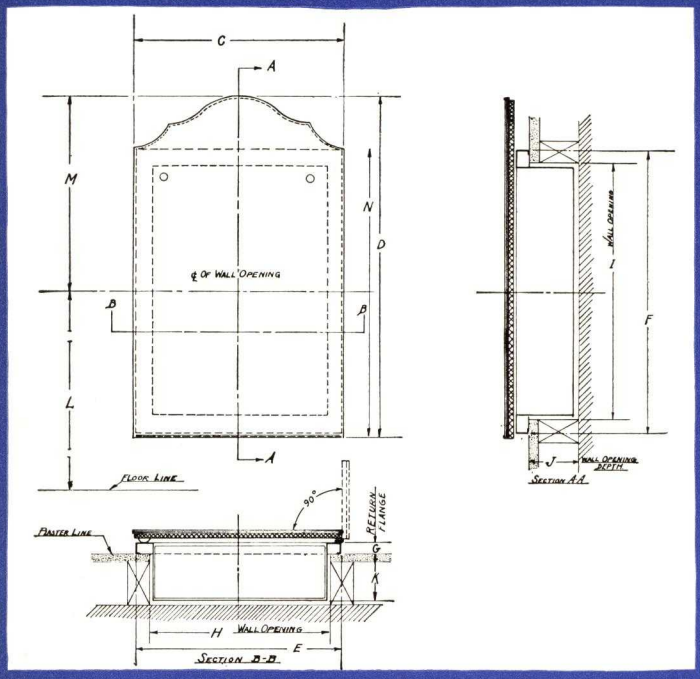
No. 850 . . . at left. A well-proportioned cabinet . . . with a rectangular frameless mirror. The mirror of the Chevy Chase is usually supplied with mitered line (designation "M") . . . but can be obtained with floral decoration (designation "F"). One size only.



MYSTIC
No. 878-EB

THE MYSTIC

No. 878EB. Same as the Chevy Chase . . . except its mirror border is painted black and studded with silver. The Mystic is decidedly effective in bathrooms trimmed in black and equipped with chromium accessories. One size only.



Construction

Heavy gauge stretcher-level steel . . . Lawco guaranteed "Whitecap" ELECTRO-RUSTPROOFED lacquer finish *over baked red oxide prime coat* . . . plate glass mirror with 5-year silver-spoil guarantee . . . heavy bulb-edge glass shelves . . . *opal glass bottom shelf cover* . . . tooth-brush holder . . . razor blade drop . . . bullet door catch . . . sturdy chromium-plated piano hinge.

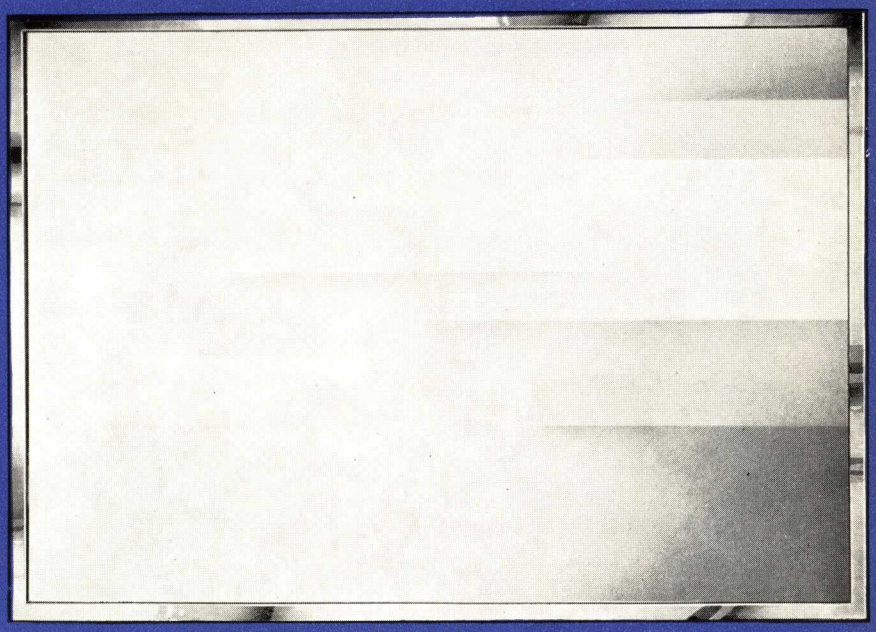
The list prices of the cabinets shown on this page range approximately from $25.00 to $32.00.

SPECIFICATIONS

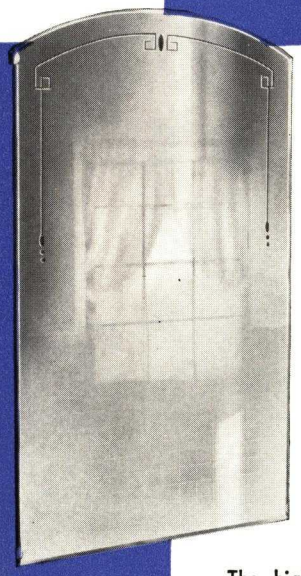
Cabinet	Number	Door, In.	Wall Opening, In.	Shelves	Shipping Wgt., lb.
Capitol	880	16x25½	13½x19½x3½	3	35
	885	18x30	15½x23¾x3½	4	44
Chevy Chase	850	16x22	13½x19½x3½	3	30
Mystic	878-EB	16x22	13½x19½x3½	3	30

Lawco MIRRORS for WALL HANGING

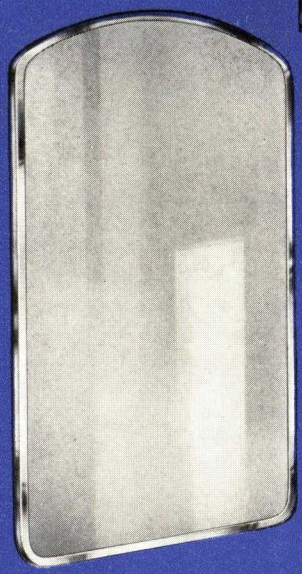
BUILT for years of service, Lawco Wall Mirrors are used not only in bathrooms and dressing rooms — but, likewise, in bedrooms, halls and other parts of the home. They are widely specified for hotels, schools, theatres, institutions, rest rooms and office and municipal buildings.



LAWCO WALL-HUNG MIRRORS: Nos. 30, 40, 45, 50, 60



Doors of Lawco Cabinets make fine Wall Mirrors

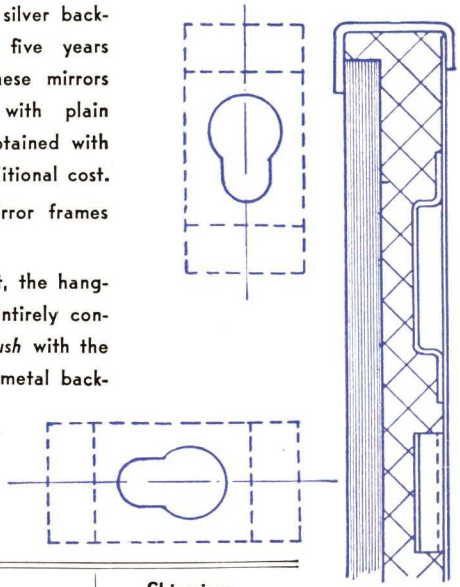


List prices of the Lawco Mirrors described above range approximately from $9.00 to $14.00.

In addition to the regular Lawco Wall-Hung Mirrors (Nos. 30, 40, 45, 50, 60), the door of any Lawco Cabinet shown in this catalog can be furnished as a wall mirror . . . with metal back and slots for hanging . . . the price being 75% of that of the complete cabinet. The two mirrors pictured at the left are, in reality, the mirror doors of two of our more popular cabinets. These mirrors, however, are not carried in stock and should be ordered well in advance of the delivery date.

LAWCO MIRRORS are high quality plate glass . . . and, because of the copper that protects their silver backing, are guaranteed for five years against silver spoilage. These mirrors are generally furnished with plain edges . . . but can be obtained with beveled edges at 10% additional cost. The highly polished chromium-surface mirror frames merit special attention.

As shown in the cross-section at the right, the hanging equipment of all Lawco Mirrors is entirely concealed and permits the mirrors to hang *flush* with the wall. The hanger slots are placed *in* the metal backing. Lawco rectangular Mirrors are slotted to hang in either a vertical or horizontal position.

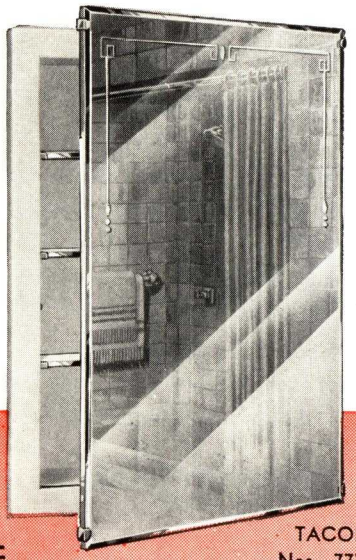


Mirror Number	Size, In.	Shipping Weight, lb.
30	12 x 18	12
40	14 x 20	14
45	16 x 20	17
50	16 x 22	19
60	18 x 24	29

Lawco PIONEER

THE PIONEER ASSEMBLAGE of cabinets is planned for moderate priced homes. These cabinets combine the traditional Lawson quality with reasonable price. Constructed and finished with the same care and precision that characterize our DeLuxe models, Pioneer Cabinets are built to withstand years of hard service. *The frameless models are equipped with the new Lawco "Jiffy" Ratchet Mirror-Clip . . .* (see *page 19*). The doors of framed models are removable.

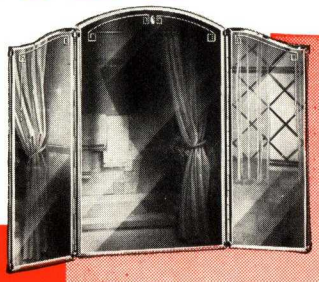
The list prices of the cabinets shown on these two pages range approximately from $17.00 to $35.00.



TACONIC
Nos. 777, 822

THE BERKSHIRE

Nos. 799, 888, 1000, 1399 . . . below. The most popular of all Lawco Cabinets. Its gracefully arched mirror and its simple engraving make the Berkshire excellent for the modest bathroom. Four "usable" sizes.



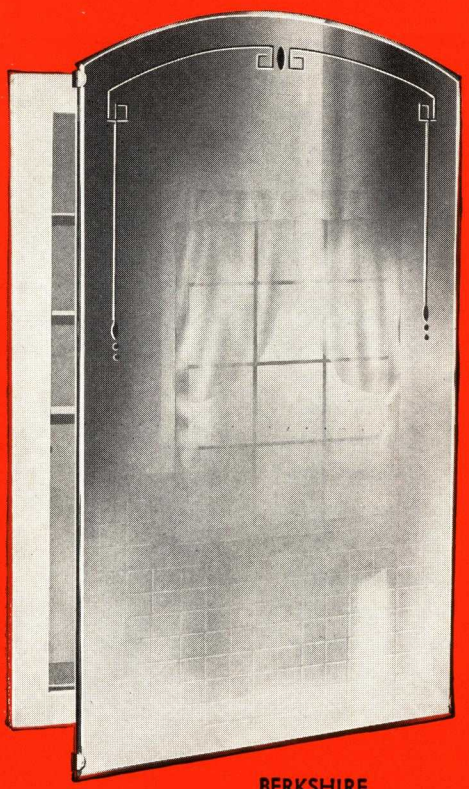
LENOX
No. 791W

THE TACONIC

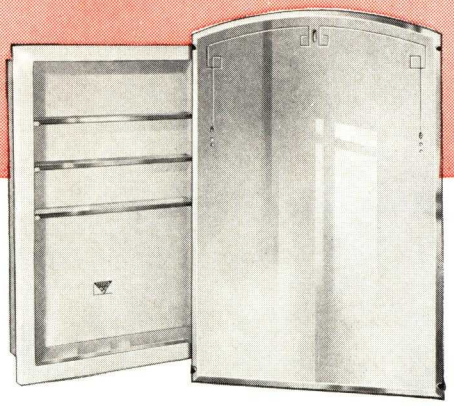
Nos. 777, 822. Same as the Berkshire . . . except with rectangular door. Two convenient sizes.

THE LENOX

No. 791-W. The Berkshire . . . *plus side wing mirrors.* Especially desirable for shaving and make-up. Wings have curved bow tops and are decorated to match the center mirror. One size only.



BERKSHIRE
Nos. 799, 888, 1000, 1399



A SPECIAL Lawco CABINET with Adjustable Hinge

A new cabinet with an unusual feature: shows either side of the face to advantage. As shown above, the door of this cabinet—after it is swung on its normal axis to a 90° angle (like all cabinets)—can then be pivoted in the opposite direction. Thus, this cabinet gives a perfect vision of the right side of the face as well as of the left. (See page 19.) Two Venetian mirror styles: frameless (No. 899); and with stainless steel frame (No. 64).

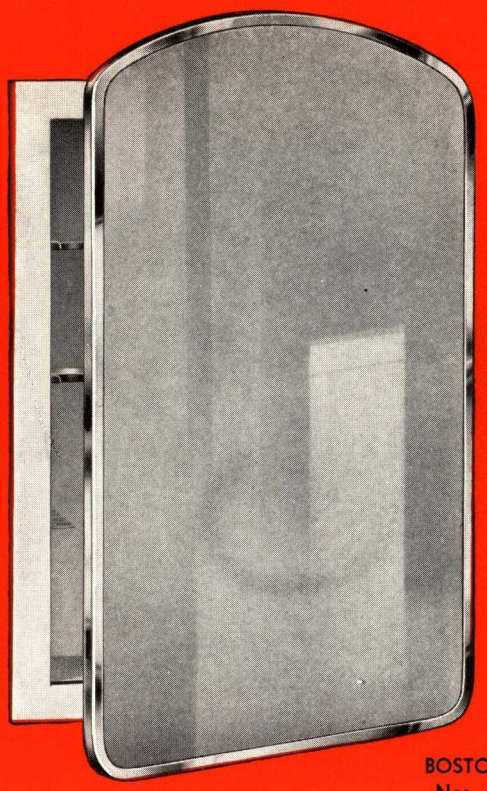
Cabinet	Number	Door, In.	Wall Opening, In.	Shelves	Shipping Wgt., lb.
Berkshire	799	16 x 24	13½ x 19½ x 3½	3	30
	888	18 x 26	15½ x 21½ x 3½	4	34
	1000	18 x 28	15½ x 23¾ x 3½	4	40
	1399	18 x 31	15½ x 27 x 3½	4	45
Lenox—Center Wings	791W	15½ x 24 8 x 22	13½ x 19½ x 3½	2	68
Taconic	777	16 x 22	13½ x 19½ x 3½	3	28
	822	18 x 24	15½ x 21½ x 3½	4	35

Nos. 899 and 64: same specifications as Nos. 799 and 54, respectively.

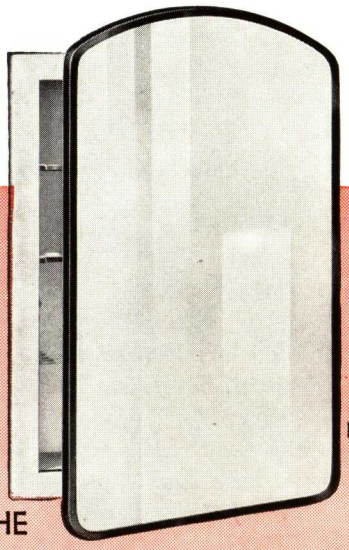
CABINETS

THE BOSTONIAN

Nos. 54, 65 . . . at right. Same as the Berkshire on the opposite page . . . except the mirror is safeguarded and held to the door by a stainless steel frame. The advantages of this frame, of course, are self-evident: it retains its rich lustre year after year, never needs replating. Two sizes.



BOSTONIAN
Nos. 54, 65



NEW YORKER
No. 054B

THE NEW YORKER

No. 054B . . . above. Same as the Bostonian . . . except its frame is finished in black lacquer. One size.

CHAMPLAIN
Nos. 46, 48, 51

LUMILINE WALL LIGHT BRACKETS
No. 222

THE CHAMPLAIN

Nos. 46, 48, 51. A substantial cabinet with wide appeal. Its mirror has stainless steel frame with rounded corners. Furnished in three sizes for special uses: The smallest size (No. 46) is suitable for first-floor lavatories. The second size (No. 48) for bathrooms where a cabinet of increased height—but not exceptional width—is required. The largest size (No. 51) for remodeling jobs where an old wood cabinet is to be replaced with a steel cabinet using the same rough wall opening.

The Champlain Cabinet at right is particularly pleasing with Lumiline Wallset Light Brackets (No. 222) as illustrated. These Brackets . . . 2¼x17 in. overall . . . can be used with any Lawco Recess Cabinet.

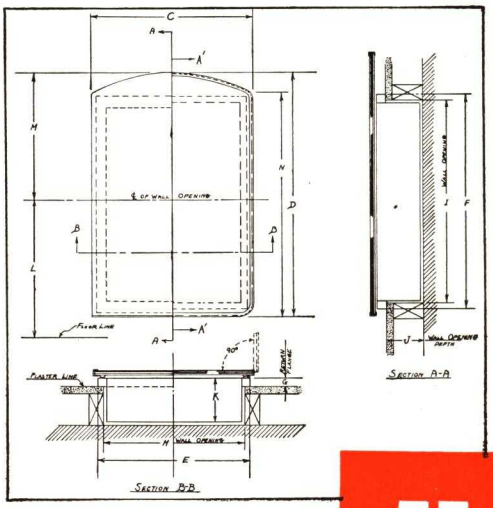
List price of brackets approx. $15.00 pair.

Construction

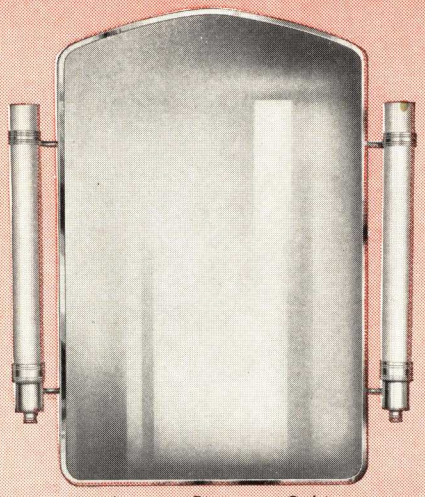
OF CABINETS ON BOTH PAGES

Heavy gauge stretcher-level steel . . . finished in fine quality hot-baked white enamel . . . plate glass mirror with 5-year silver-spoil guarantee, removable doors on framed cabinets, "Jiffy" ratchet mirror clips (on frameless cabinets) . . . bulb-edge glass shelves . . . glass bottom shelf cover . . . toothbrush holder . . . razor blade drop . . . bullet door catch . . . sturdy chromium door stop and piano hinge . . . shelves adjustable to 10 positions.

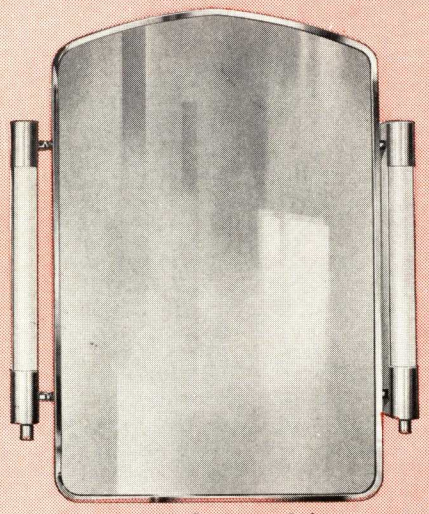
Cabinet	Number	Door, In.	Wall Opening, In.	Shelves	Shipping Wgt., lb.
Bostonian	54	16 x 24	13½ x 19½ x 3½	3	31
	65	18 x 28	15½ x 23¾ x 3½	4	42
New Yorker	054B	16 x 24	13½ x 19½ x 3½	3	31
Champlain	46	16 x 22	13½ x 19½ x 3½	3	29
	48	18 x 31	15½ x 27 x 3½	4	45
	51	21 x 27	18¼ x 24 x 3½	4	62



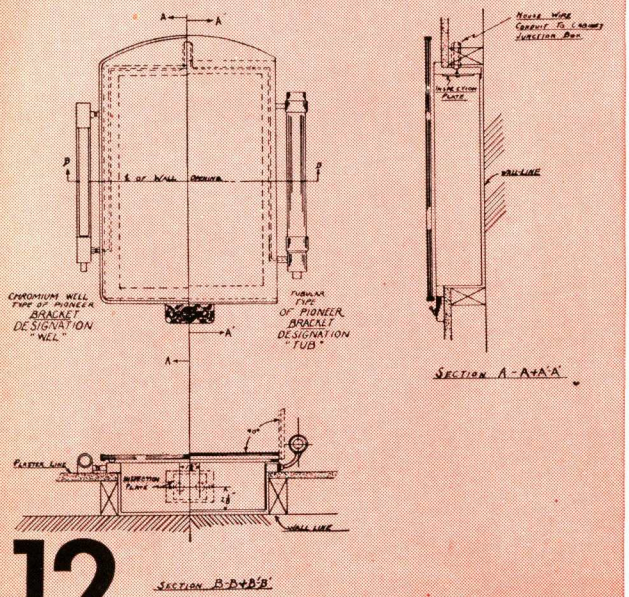
Lawco PIONEER LIGHTED CABINETS



A Lawco Pioneer Cabinet equipped with Shade Candle Side Lights.



A Lawco Pioneer Cabinet equipped with Well Bracket Side Lights.



The following Pioneer Cabinets can be equipped with either of the two popular styles of side lighting shown: Nos. 054B . . . 46 . . . 54 . . . 65 . . . 777 . . . 799 . . . 822 . . . 888 . . . 1000.

SHADE CANDLE SIDE LIGHTS

This style of lighting . . . with its tubular shade candles . . . gives a soft, glareless light. It consists of a cup attached to each side of the cabinet. This cup contains the socket into which a *clear* T-8 light bulb is screwed; it also supports the tubular shade candle of frosted glass. An arm and ring placed further up on the side of the cabinet hold the candle in place. Cabinets equipped with this style of lighting are designated by "TUB" (example: No. 799-TUB).

WELL BRACKET SIDE LIGHTS

This style lighting gives full illumination and diffuses the light without glare. It consists of a long, narrow, chromium-plated light-well attached to each side of the cabinet. At each end of the well a cup is provided: in the lower cup is the socket into which the *frosted* T-8 light bulb is screwed; in the upper cup the top of the bulb is concealed and held secure. The well is firmly fastened to the return flange of the cabinet . . . with its back flush with the plaster line. Cabinets equipped with these Well Light Brackets are designated by "WEL" (example: No. 799-WEL).

To determine the approximate list price of Pioneer Cabinets equipped with these Lighting Brackets, add to the list prices of the cabinets:

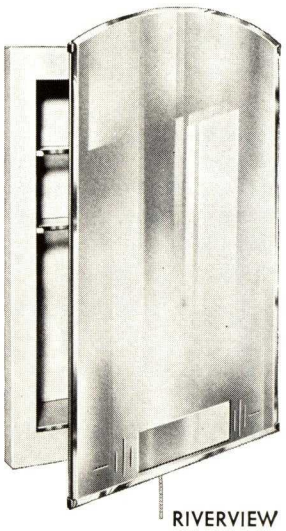
For the Shade Candle Lights, add approx. $20.50
For the Well Bracket Lights, add approx. $17.50

Prices include all necessary equipment—except the T-8 light bulbs which are easily obtainable.

On these electrically lighted cabinets we also supply the new Lawco Combination Switch and Convenience Outlet Unit described on pg. 4.

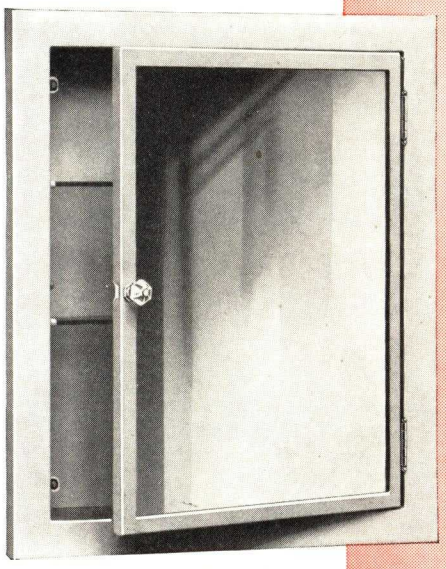
THE RIVERVIEW

Model ML. This cabinet has a Venetian mirror with an ingenious and novel lighting feature: its light shines through a frosted panel in the lower part of the mirror. As this light casts a brilliant glow over the reflected object, it is particularly advantageous for shaving and make-up. The T-10 tubular light bulb in the cabinet base also illuminates the cabinet interior. Construction of the Riverview same as cabinets illustrated on Pages 10 and 11. Dimensions same as those of the Berkshire (No. 799) shown on page 10. Approximate price, including light bulb: $18.00.



RIVERVIEW
Model ML

Lawco CHALLENGER CABINETS



CHALLENGER
With Full Door
Nos. 1100, 3100, 4100

FOR HOTELS AND APARTMENTS

Lawco Challenger Cabinets are built unusually durable to withstand years of severe usage. As they are low in price, they are widely specified for large hotel and apartment projects. Generally furnished with plain mirror . . . beveled mirror also available at 10% additional cost. Detail drawings on request.

THREE DISTINCT MODELS

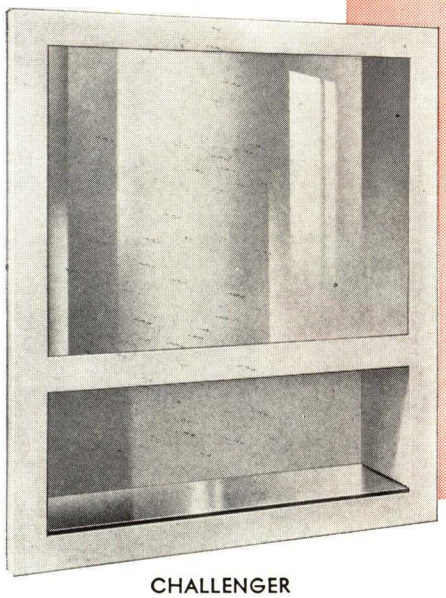
With Full Door (Nos. 1100, 3100, 4100) . . . sturdily constructed in every detail. List prices range approximately from $10.00 to $15.00. (Only when ordered in large quantities, can this type Challenger be equipped with hotel accessories.)

With Open Shelf (Nos. 5600, 5650) . . . available with or without hotel accessories. List price, without accessories, approximately from $15.00 to $17.00. When ordered in quantity, this type Challenger can also be furnished with chromium-framed door—details on request.

With Recess Shelf and Mirror Combination (No. 535) . . . available with or without hotel accessories. List price, without accessories, approximately $15.00.

Construction

Heavy gauge stretcher-level steel finished in high quality hot-baked enamel . . . mirror, plate glass (crystal on No. 1100) with 5-year silver-spoil guarantee . . . bulb-edge glass shelves . . . glass bottom shelf cover . . . razor blade drop . . . bullet door catch . . . sturdy chromium-plated door stop . . . shelf adjustment . . . semi-concealed nickel-plated hinge.



CHALLENGER
Recess Shelf
and Mirror
No. 535

Hotel Accessories

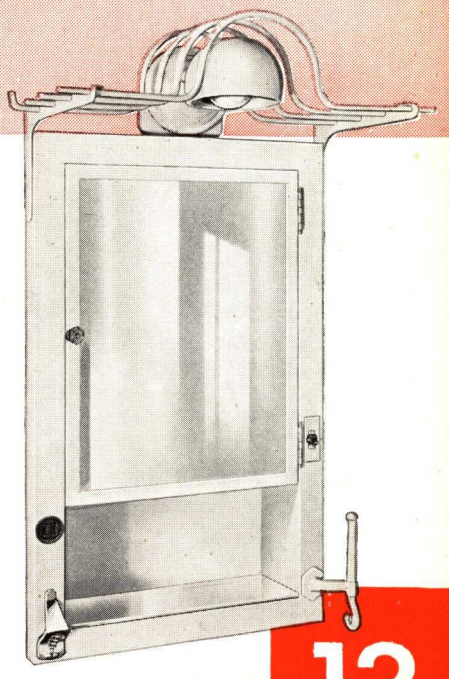
The following accessories can be readily furnished on Open Shelf type (Nos. 5600 and 5650) and on the Recess Shelf and Mirror Combination (No. 535). For cost estimate, see price list.

(a) Wet Towel Hook.
(b) Bottle Opener.
(c) Bottle Opener and Cork Screw Combination.
(d) Convenience Outlet.
(e) Hump Towel Rack.
(f) Overhead Light Fixture with switch (illustrated).
(g) Overhead Light Fixture with pull chain.
(h) Overhead Light Fixture *without* switch or chain, for use with wall switch.
(i) Single Cup Light Brackets (chromium) and switch. Brackets located on side flanges of cabinet box.
(j) Single Cup Light Brackets (chromium) *without* switch. For use with wall switch.
(k) Straight Towel Rack—for use either without lights or with side brackets.

For wall accessories see page following.

Style	No.	Mirror, in.	Outside Dimensions of Flange, in.	Wall Opening, in.	Shelves	Shipping Wt., lb.
Full Door	1100	12x16*	16 x20 x1 1/4	13 3/8x17 3/8x3 3/8	2	17
	3100	12x16	16 x20 x1 1/4	13 3/8x17 3/8x3 3/8	2	17
	4100	14x18	18 x22 x1 1/4	15 3/8x19 3/8x3 3/8	3	24
Open Shelf	5600	12x16	16 x26 x1 1/4	13 3/8x23 3/8x3 3/8	3	24
	5650	14x18	18 x28 x1 1/4	15 3/8x25 3/8x3 3/8	3	27
Mirror & Shelf	535	18x14	20 1/2x24 1/8x1	6 1/2x18 x4 3/4		22

*Crystal Mirror on No. 1100. Plate glass mirrors on all others.

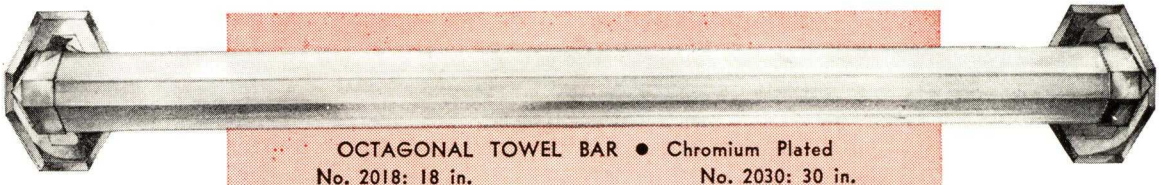


CHALLENGER
With Open Shelf
Nos. 5600, 5650

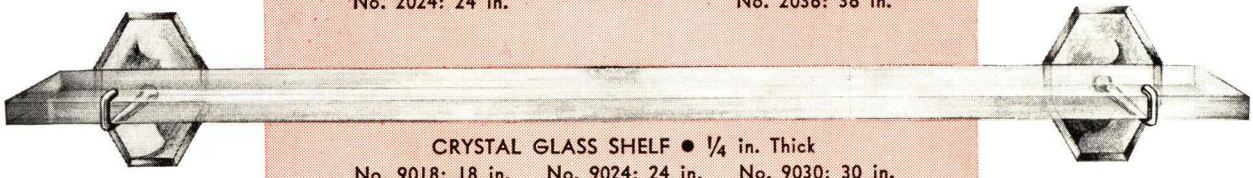
Lawco FORGED CHROMIUM BATHROOM ACCESSORIES

These newly designed Accessories . . . fitting compliments to Lawco Cabinets . . . harmonize beautifully with any style bathroom or dressing room. Because of their sturdy construction — forged brass, heavily plated first with nickel and then with hard chromium — these Lawco Accessories insure lifetime service and permanent satisfaction.

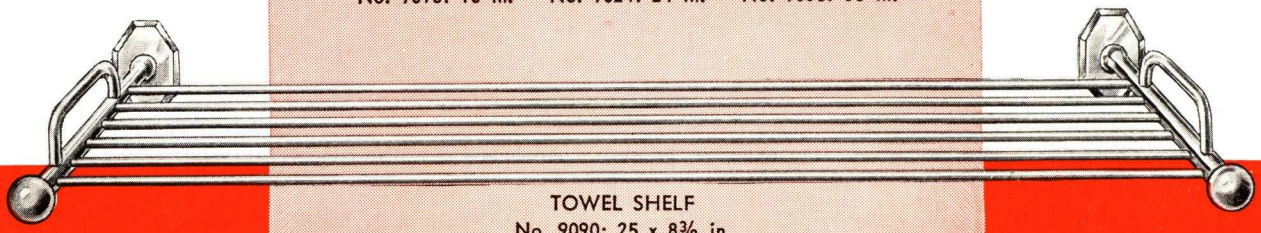
They are decidedly resistant to scratching and withstand the abuse of grouting on tile walls.
The Recess Accessories have a larger and wider flange . . . fit perfectly. The Projecting Accessories have a new plug key that holds — *and holds securely!*



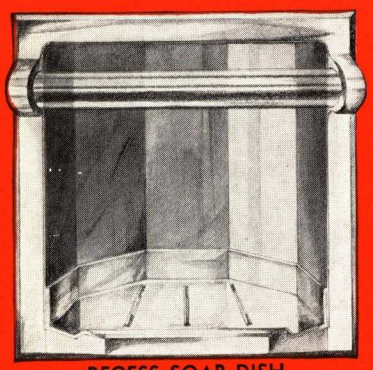
OCTAGONAL TOWEL BAR • Chromium Plated
No. 2018: 18 in. No. 2030: 30 in.
No. 2024: 24 in. No. 2036: 36 in.



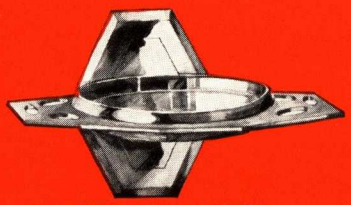
CRYSTAL GLASS SHELF • 1/4 in. Thick
No. 9018: 18 in. No. 9024: 24 in. No. 9030: 30 in.



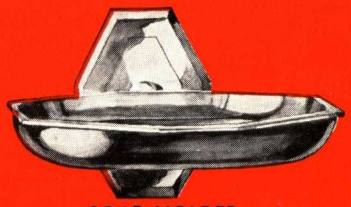
TOWEL SHELF
No. 9090: 25 x 8 3/8 in.



RECESS SOAP DISH AND GRAB BAR
No. 9780: with glass tray, 6 1/4 x 6 1/4 in.

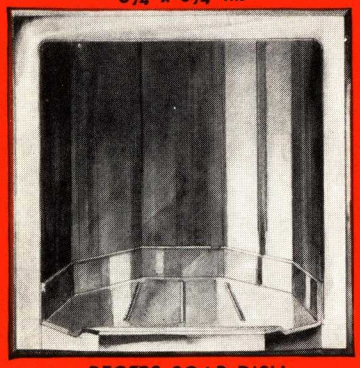


TUMBLER AND TOOTHBRUSH HOLDER
No. 9045: as shown
No. 9040: without toothbrush holes



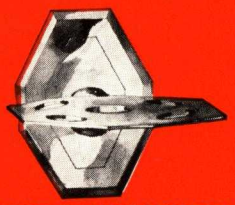
SOAP HOLDER
No. 9531: with drain holes
No. 9530: non-draining

RECESS TUMBLER HOLDER
No. 9760: 6 1/4 x 6 1/4 in.

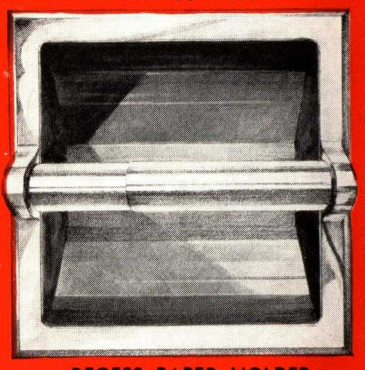


RECESS SOAP DISH
No. 9750: with glass tray, 6 1/4 x 6 1/4 in.

ROBE HOOK
No. 9060: as shown
No. 9065: double hook



TOOTHBRUSH HOLDER
No. 9050: for 5 brushes



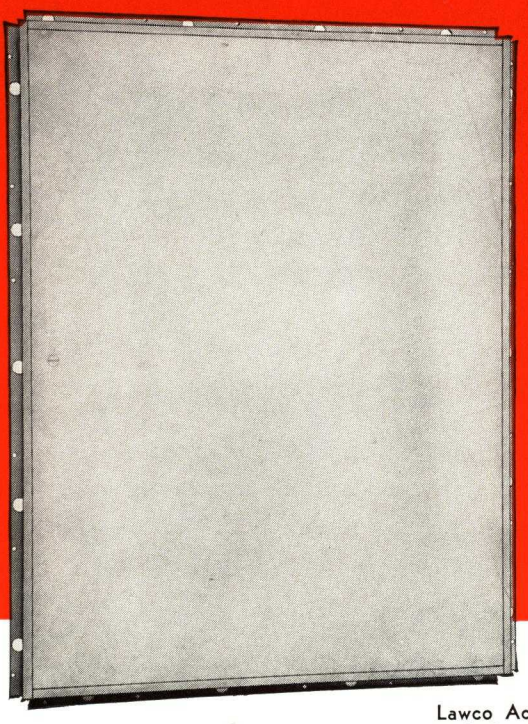
RECESS PAPER HOLDER
No. 9770: chromium roller, 6 1/4 x 6 1/4 in.
No. 9775: black wood roller, 6 1/4 x 6 1/4 in.

PROJECTING PAPER HOLDER
No. 9070: chromium roller
No. 9075: black wood roller

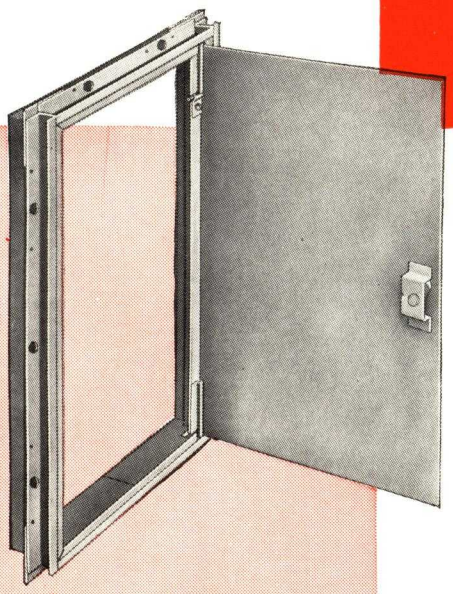
IN ORDERING ABOVE ACCESSORIES: For screw or toggle bolt installation, prefix catalog number with "S." For setting in cement with concealed screw feature, prefix number with "L." For estimates, see price sheet.

Lawco ACCESS PANELS

THESE ACCESS PANELS are used to permit immediate access to pipes, valves, air shafts and similar equipment located in or behind walls. The panel door closes firmly on the inside sill or flange . . . thereby prevents dust and dirt from entering the room. The entire Unit is made of steel and is, of course, fire-proof. After installation, it can be covered with plaster or wallpaper — and thereby totally concealed.



Lawco Access Panel with Door Closed. Note inconspicuous screw head.



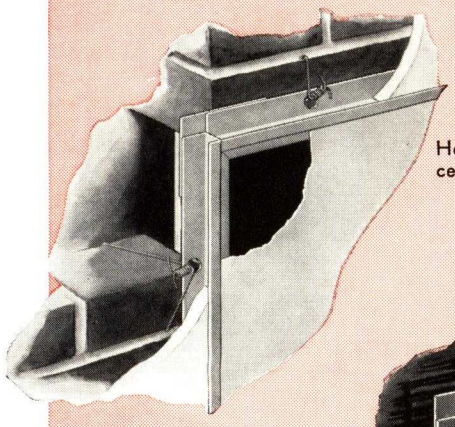
Lawco Access Panel with Door Open. Door is easily removed by loosening one screw and sliding back the pivot hinge.

The door of the Unit is held in place by an inconspicuous screw-head lock. This lock, when merely turned by a screw driver, operates a back-out type cam which throws the door lid, on opening, clear of the rebate. The door swings to a full 90° angle and can be removed and replaced with ease.

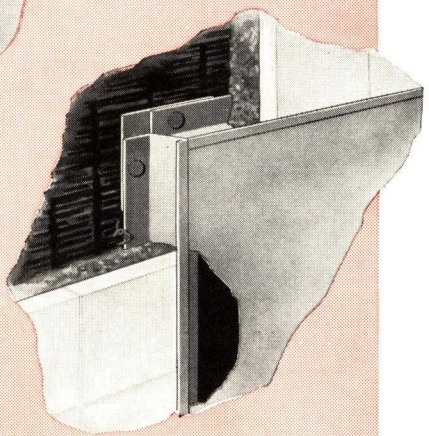
FURNISHED IN 2 TYPES

When used in plaster walls, the Lawco Access Panel — as shown in the upper illustration at the left — is supplied with the fastening flange of the panel set ½ inch back from the face of the panel.

When used with walls faced with marble, tile or similar material requiring a setting bed of mortar, the Access Panel — as shown in the lower illustration — is supplied with the fastening and key flange set 1½ inches back from the face of the panel.



How the Lawco Access Panel is set in plaster.



How the panel is set in walls faced with marble, tile or similar material.

List Prices of Lawco Access Panels range approximately from $5.00 to $13.00

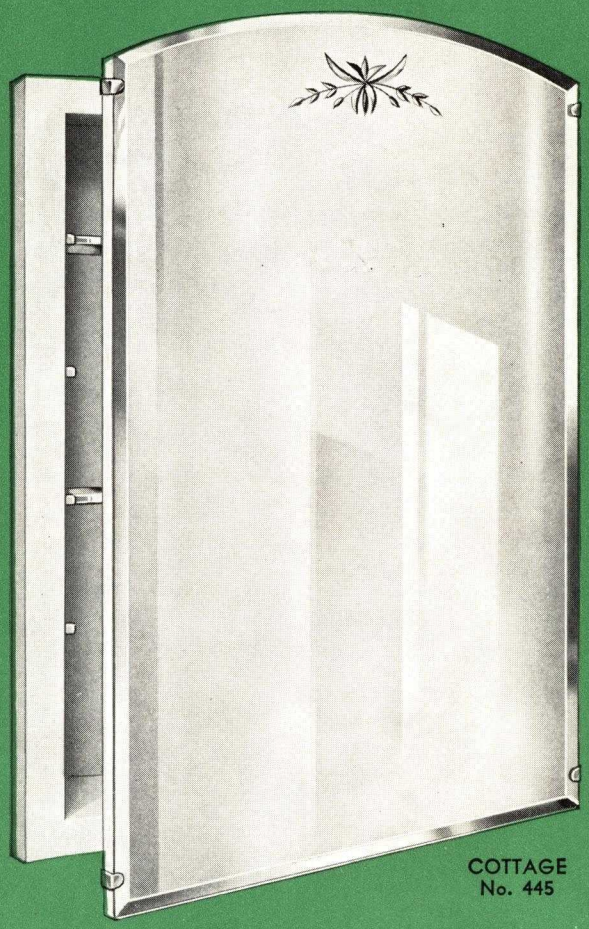
Panel Number		Panel, In.	Wall Opening, In.	Shipping Wgt., lb.
For use in plaster walls	For use in hard surface walls			
5	55	7½ x 11½	8 x 12	9
11	115	14½ x 18½	15 x 19	12
21	215	18½ x 24½	19 x 25	19
23	235	18½ x 30½	19 x 31	24

Lawco PURITAN

THE LAWCO CABINETS pictured on this and the opposite page combine strong construction with remarkably reasonable price. They are particularly designed for low cost residences ($5,000 and under) and for summer cottages. Puritan Cabinets are priced as low as substantially made recess cabinets can be fabricated and sold.

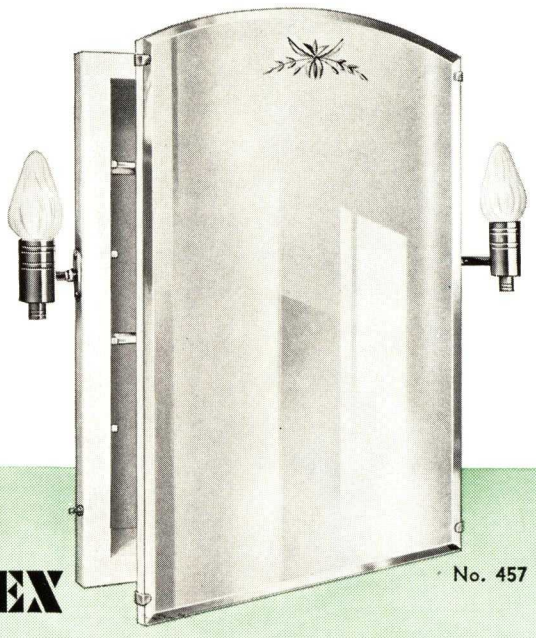
THE COTTAGE

No. 445 . . . below. This cabinet is of the true frameless Venetian type with the typical floral engraving. An unusually popular model.



COTTAGE
No. 445

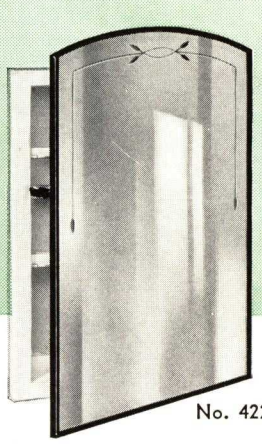
List prices of Cabinets on these two pages range approximately from $9.00 to $18.00. Lighted Cabinet approximately $20.00.



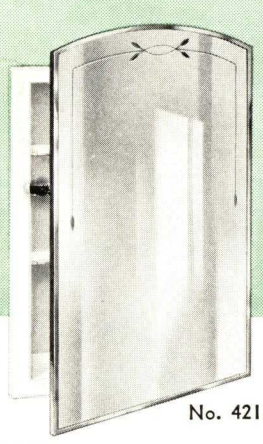
No. 457

THE ESSEX

No. 457. A big selling feature for homes built for the market. A Venetian cabinet . . . smart chromium-plated side lights . . . and a surprisingly low cost. The cost, in fact, is as low as a lighted cabinet with Lawco construction permits. Same construction as the Cottage. Wired complete, with switch located on return flange; no convenience outlet supplied.



No. 422



No. 421

THE NASSAU

No. 422. Same as the Cottage . . . except the mirror is held to the door by black enameled frame designed to harmonize with bathrooms trimmed in black.

THE SUFFOLK

No. 421. Same as the Cottage . . . except the mirror is held to the door by highly polished frame of stainless steel. Frame retains its lustre year after year, never needs replating.

Construction OF CABINETS ON THIS PAGE

Medium gauge automobile body steel . . . baked enamel finish . . . crystal mirror with 5-year silver-spoil guarantee . . . "Jiffy" ratchet mirror clips (on frameless mirrors) . . . bulb-edge glass shelves . . . toothbrush holder . . . razor blade drop . . . bullet door catch . . . nickel plated door stop . . . selective shelf adjustment (*i.e.*, four positions for three shelves) . . . sturdy butt hinges.

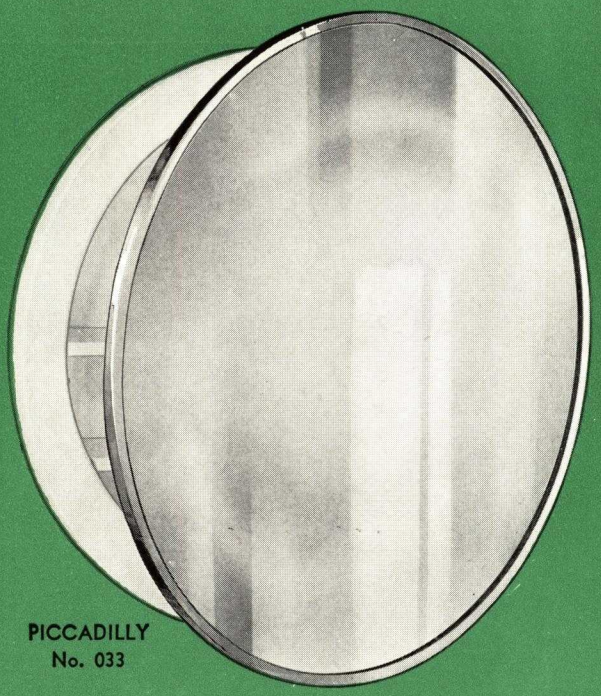
CABINETS

THE PICCADILLY

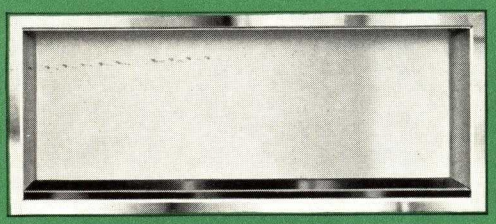
No. 033 . . . at right. The popular round mirror recess cabinet . . . with chromium framed mirror and effective simple engraving. Round pan-shaped body. Surprisingly low in cost. Furnished with four expanded metal pieces, triangular in shape, to facilitate the setting of this round cabinet in a square rough opening. *Complete installation instructions with each cabinet.*

THE RECESS SHELF

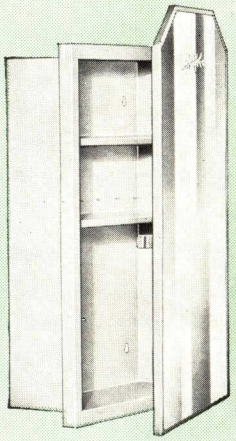
No. 599. Decidedly smart with the Piccadilly. Built of stainless steel, this Shelf retains its lustre, never needs replating. The bottom of the shelf is covered with *black* opal glass.



PICCADILLY
No. 033

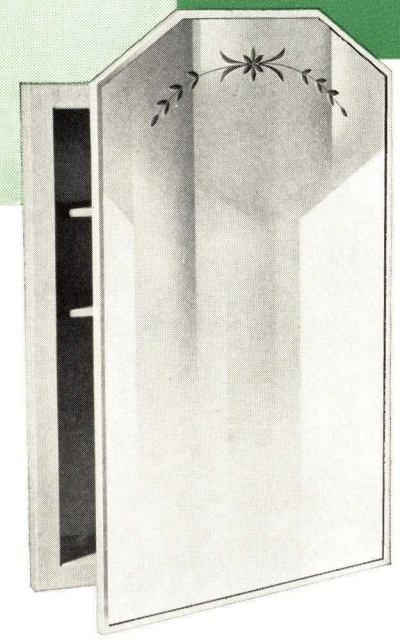


RECESS SHELF
No. 599



THE CAMPER

No. 14-415 . . . at left. The lowest price recess cabinet in the Lawco line. Ideal for summer cottages . . . white enameled mirror frame.



THE BUNGALOW

No. 415 . . . at right. A remarkably low cost cabinet . . . with modernistic top, white enameled frame and "spray" engraving.

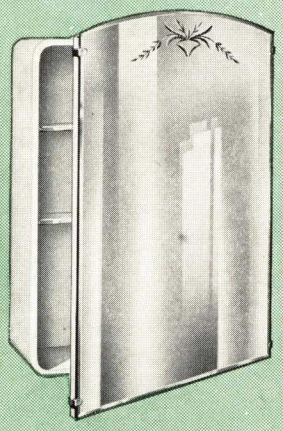
Construction OF CABINETS ON THIS PAGE

Medium gauge steel . . . white enamel finish . . . double strength glass mirrors . . . metal shelves . . . toothbrush holder . . . razor blade drop . . . bullet door catch . . . sturdy butt hinges.

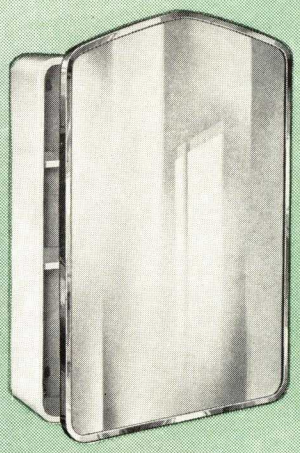
Cabinet	Number	Door, In.	Wall Opening, In.	Shelves	Shipping Wgt., lb.
Cottage	445	15½ x 22	13⅝ x 18⅝ x 3½	2	20
Essex	457	15½ x 22	13⅝ x 19¼ x 3½	2	30
Suffolk	421	15½ x 23	15⅝ x 18⅝ x 3½	2	17
Nassau	422	15½ x 23	13⅝ x 18⅝ x 3½	2	17
Piccadilly	033	19¾ diam.	15½ x 15½ x 3½	2	15
Camper	14-415	13½ x 20	12⅜ x 17⅜ x 3⅞	2	12
Bungalow	415	15½ x 23	13¾ x 18¾ x 3½	2	15

SHELF, No. 599: Overall, 17 x 7 in.; Wall Opening, 15⅞ x 6 x 3½ in.

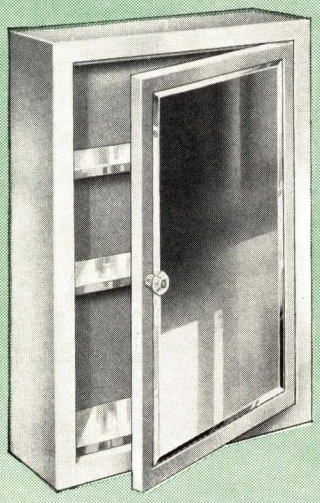
Lawco WALL-HUNG CABINETS



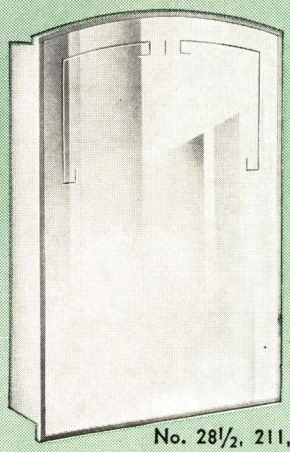
No. 94



Nos. 121, 131, 142, 152



No. 85



No. 28½, 211, 214

THESE LAWCO CABINETS . . . built with the typical Lawco sturdiness . . . are designed for use where recessing is not possible or desired. These cabinets conceal their hanging equipment and hang flush with the wall. This is accomplished by hanger slots cut in the back of the cabinet; into these slots fit the screws already inserted in the wall. The mirrors are guaranteed for five years against silver spoilage.

No. 94 . . . With frameless Venetian crystal mirror.

Nos. 131, 152 (illustrated) . . . With Venetian crystal mirror and chromium frame.

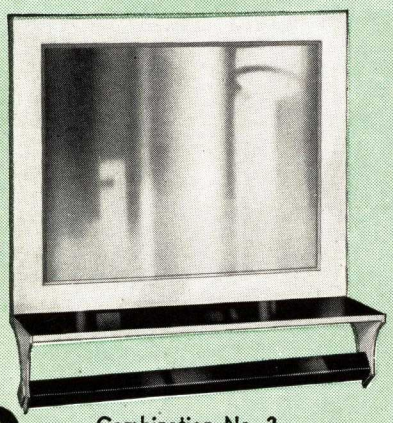
Nos. 121, 142 . . . With Venetian crystal mirror and black enameled frame.

No. 85 . . . Heavily constructed for severe usage. Built to comply with specifications of many government departments. Plate glass mirror.

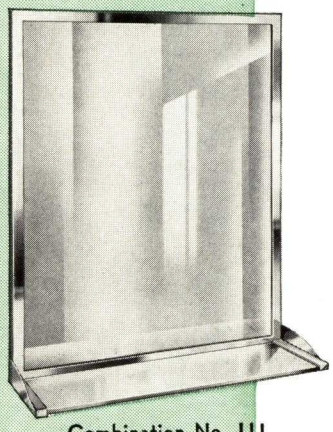
Nos. 28½, 211, 214 . . . With bowed-top mirror neatly engraved and bound with narrow white enamel frame. Three "convenient" sizes. Double strength glass mirror. For quotations on above cabinets, see price list.

Cabinet Number	Mirror, In.	Size, Overall, In.	Shelves	Shipping Wgt., lb.
94	14 x20	13½x18 x4½	2 (glass)	16
121, 131	12 x18	11½x16 x4½	2 (metal)	13
142, 152	14 x20	13½x18 x4½	2 (metal)	16
85	12 x16	16 x20 x4⅝	2 (glass)	21
28½	11 x15½	10¾x14 x3½	1 (metal)	5½
211	12 x17½	11¾x15¾x3¼	2 (metal)	7
214	13½x20	13¼x18¼x4½	2 (metal)	12

Lawco MIRROR and SHELF COMBINATIONS



Combination No. 2



Combination No. 111

Three Lawco specialty combinations . . . for kitchens, offices, schools, rest rooms, filling stations, etc. For quotations, see price list.

No. 2 (illustrated) . . . With rectangular plate mirror in white enameled frame . . . shelf of *black* opal glass . . . *black* towel bar.

No. 1 . . . Same as No. 2 . . . except with shelf of *white* opal glass and *white* towel bar.

No. 111 . . . A new Lawco Combination . . . with rectangular plate mirror in narrow chromium-plated frame. Crystal glass shelf is securely fastened to mirror by chromium-plated brackets.

Combination Number	Mirror, In.	Size, Overall, In.	Number Per Carton	Shipping Wgt. each, lb.
1, 2	13¼ x 15½	18 x 20 x 6	2	15
111	16 x 20	16½ x 20½ x 6	1	18

Lawco CABINET FITTINGS

The Fittings used in Lawco Cabinets play an important rôle in the year-after-year service of these units. They have therefore been designed with especial care and deserve careful study. . .

TOOTHBRUSH HOLDER . . . convenient and sanitary . . . located on the back of the mirror door. Stainless steel on DeLuxe and Pioneer Cabinets. Aluminum on Puritan Cabinets.

RAZOR BLADE DROP . . . "for safety's sake" . . . convenient. A slot in the back of the wall of the cabinet: discarded blades fall between the studding. Supplied on all Lawco Recess Cabinets.

DE LUXE DOOR STOP . . . chromium-plated finish . . . on DeLuxe Cabinets only.

SHELF ADJUSTMENT

On DeLuxe Cabinets: stainless steel standards with shelf supports to match (as shown) . . . permits universal adjustment.

On Pioneer Cabinets: louvres in side walls of cabinet box support fitted aluminum shelf supports . . . shelves adjustable to 10 different positions.

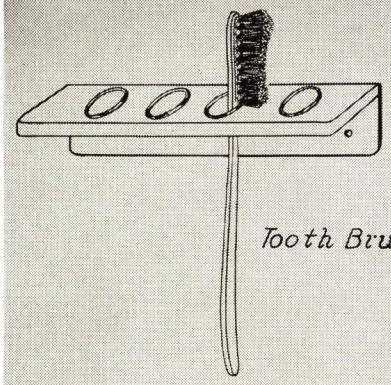
On Challenger and Puritan Cabinets: pairs of welded-in shelf supports — in addition to those required by the number of shelves — are supplied . . . thereby giving selective shelf adjustment.

"JIFFY" RATCHET MIRROR CLIP (patent applied for) . . . a new Lawco feature. Makes possible the postponement of placing the mirror on the cabinet door until after the cabinet is set in the wall. With this new Clip, the mirror can then be fastened to the door with ease . . . in less than thirty seconds . . . without chance of damage. The "Jiffy" Clip is furnished on all Lawco Cabinets of the frameless Venetian type . . . except those that use the mirror bolt construction.

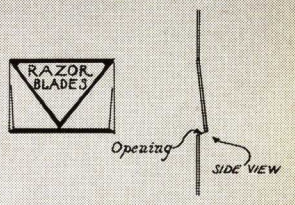
PIANO HINGE . . . strength where strength is needed . . . prevents sagging of the door . . . finished in chrome on DeLuxe Cabinets, in nickel on Pioneer Cabinets . . . (butt hinges on Puritan Cabinets).

ADJUSTABLE DOOR . . . illustration at right shows the unusual feature of the Special Cabinet (Nos. 899 and 64) described on page 10. This Door gives full view of either side of the face.

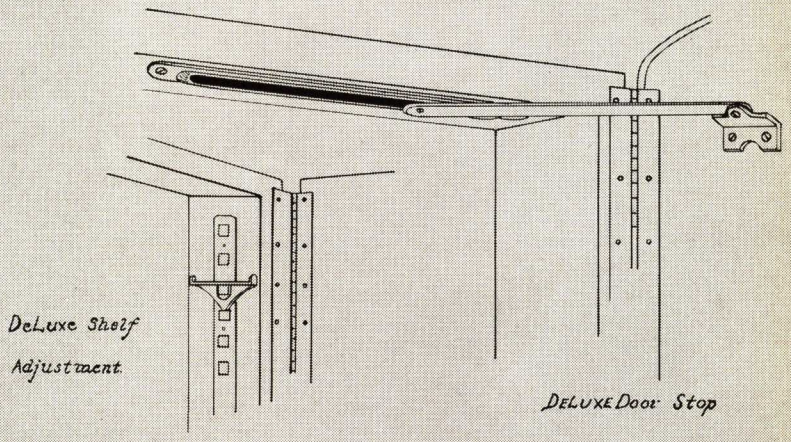
BAR AND SPRING DOOR STOP . . . a special feature on Lawco Pioneer Cabinets. Bar Door Stop (without spring) furnished on Puritan Venetian Cabinets. Chain door stop on other Puritan Cabinets.



Tooth Brush Holder

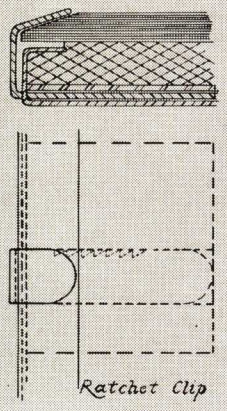


Razor Blade Drop

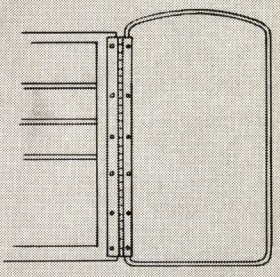


DeLuxe Shelf Adjustment

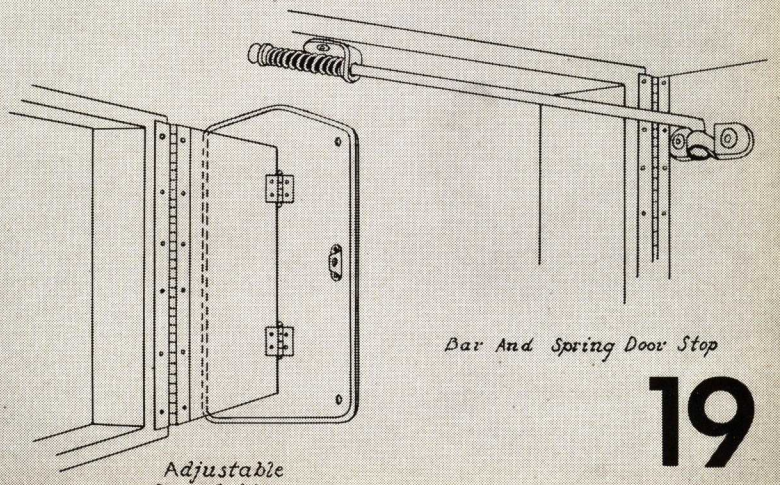
DeLuxe Door Stop



Ratchet Clip



Piano Hinge



Adjustable Door Cabinet.

Bar And Spring Door Stop

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Lawson DISTRIBUTION FACILITIES

Lawco Bathroom Cabinets, Wall Mirrors, Access units, and Bathroom Accessories are sold by leading dealers in plumbing supplies, lumber, builders hardware and tile . . . in every section of the country. These distributors are prepared to quote on your requirements and to make prompt delivery on standard Lawco products.

★

Lawson CABINET DIVISION SALES ORGANIZATION

*SALES HEADQUARTERS: Evans and Whateley Streets, CINCINNATI, OHIO

Ray E. Van Hart, Middle Western Territory, c/o Cincinnati Office
Hugh Smith, Northern Indiana Representative, P.O. Box 1885, Station "E," Cleveland, Ohio

*NEW YORK, N. Y., *George V. Galbreath*, 17 Warren St.

*CHICAGO, ILL., *H. L. Jillson*, 1327 W. Washington Blvd.

*BOSTON, MASS., *W. H. Maxwell*, c/o Bigelow & Dowse Warehouse, 169 "A" St.

*WASHINGTON, D. C., *I. A. Pectol*, 5616 13th St., N. W.

*MONTREAL, QUEBEC, CANADA, *R. G. K. Ward*, 4443 Beaconsfield Ave., N. D. G.

*MINNEAPOLIS, MINN., *Gene O'Reilly*, 714 Washington Ave., N.

*PHILADELPHIA, PA., *John Sloan, Jr.*, 1918 West 74th Ave.

*DETROIT, MICH., *E. J. Anderson*, 14 Smith St.

DETROIT, MICH. (hardware trade only), *F. C. Funke*, P. O. Box 244.

EXPORT DEPARTMENT, *C. C. Chopp, Mgr.*, Rockefeller Bldg., Cleveland, Ohio.

**Indicates warehouse stocks carried in these cities.*

★

BUFFALO, N. Y., Walter L. Hoffman, 84 Sterling Ave.

CLEVELAND, OHIO, S. Arthur George, 1200 W. 9th St.

DALLAS, TEX., A. T. Powell Co., 511 Great National Life Bldg.

DAYTON, OHIO, Charles L. Woodbury, 2053 Litchfield Ave.

DENVER, COLO., Carl H. Roath, 1925 W. 3rd Ave.

GRAND RAPIDS, MICH., T. J. Hughes, 1125 Madison Ave., S.E.

HOUSTON, TEX., A. T. Powell Co., J. M. Collins, Agt., 809 First National Bank Bldg.

JACKSONVILLE, FLA., Wesley C. Lantz, 543 W. 25th St.

KANSAS CITY, MO., Harold S. Thiem, P. O. Box 384

KNOXVILLE, TENN., James H. Rolen, P. O. Box 1464

MILWAUKEE, WISC., L. J. Novotny, Plankinton Bldg.

OKLAHOMA CITY, OKLA., L. A. Wheaton, P. O. Box 411

PHILADELPHIA, PA., J. Harvey Ward (for Eastern Pa.), 117 N. 2nd St.

PITTSBURGH, PA., Metal Cabinets & Built-In Corp., 3008 Jenkins Arcade

PORTLAND, ORE., Otto A. Cook, 331 N.W. 12th Ave.

ROCHESTER, N. Y., Charles A. Kolstad, 243 Long Acre Road

SALT LAKE CITY, UTAH, Rex Williams, 409 Dooly Bldg.

SAN ANTONIO, TEX., A. T. Powell Co., A. E. Connor, Agt., 419 Houston Bldg.

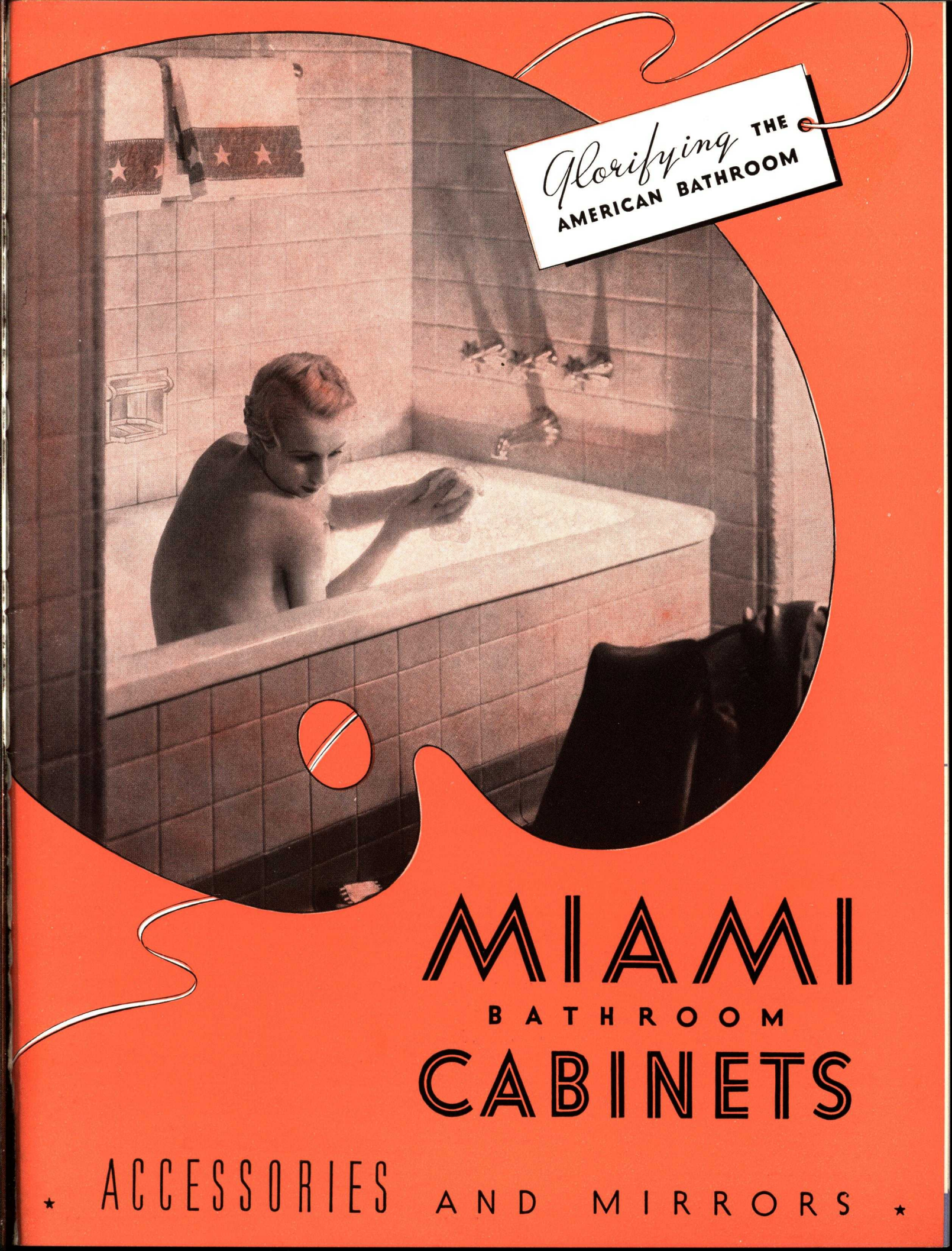
SEATTLE, WASH., J. W. Mitchell, 1515 Bellevue Ave.

ST. LOUIS, MO., The L. C. Watling Co., 100 N. Broadway Bldg.

TUCSON, ARIZ., Construction Service Co., 431½ N. 4th St.

VANCOUVER, B. C., W. G. Breeze Co., 119 Pender St.

WINNIPEG, MAN., George Peatt & Co., 35 Aikins Bldg.



MIAMI
BATHROOM
CABINETS

★ ACCESSORIES AND MIRRORS ★

MIAMI CABINETS

The Company The Philip Carey Company, an institution of international scope, purchased the Miami Cabinet Company in 1933. The trade name "Miami," which previously had a world-wide reputation for the highest standard of quality in steel bathroom cabinets, was linked with the name Carey—long famous through the building industry.

The products shown in this catalog are the result of thirty years' experience in the fabricating and finishing of metal. This experience, backed by the resources of The Philip Carey Company (organized 1873), is your guaranty of complete satisfaction.

Design The modern bathroom of today demands beauty. The first requisite for a cabinet is a pleasing design that will add a distinctive touch. The cabinet is one of the most frequently used pieces of equipment in the bathroom and must therefore be rugged in construction. It must not only have eye appeal, but must also be designed and constructed so that it will give a lifetime of useful service under the most adverse conditions. Miami Cabinets meet these requirements one hundred per cent.

The designs presented in this Catalog are the result of seventeen years' experience in manufacturing bathroom cabinets, and include many exclusive models which appeal to those who demand the ultra-modern in bathroom equipment. Never before in the history of the steel bathroom cabinet industry have so many new and outstandingly beautiful cabinets been offered in a single catalog.

Co-operation with Architects Miami-Carey designers and engineers work in close co-operation with architects, builders and contractors in the interest of a better understanding between the home owner, the architect and the manufacturer. Architects and contractors are invited to call on us for sketches and helpful suggestions on any unusual bathroom cabinet and mirror problems. If more complete details are required on any cabinets listed and illustrated in this catalog, please write to us.

Over two hundred practical cabinet men located in strategic points throughout the country are available to assist you with your cabinet and mirror problems. See back cover for partial list of branch offices and distributors.

MIAMI CABINET DIVISION — THE PHILIP CAREY COMPANY

Middletown, Ohio

A FEW TYPICAL INSTALLATIONS

For seventeen years, MIAMI Cabinets have been recognized as the finest examples in bathroom cabinet construction. In 1933, the Carey Cabinets were introduced for the first time. Today, the combined line is known as MIAMI-CAREY, the most complete line of cabinets, mirrors and accessories offered the trade.

It may well be said that the sun never sets on Miami-Carey Cabinets. Thousands of them are in use all over the world—in China, Japan, India, Italy, France, England and in the South American countries as well as in all the states in the United States; likewise, in ships that "Go Down to the Sea."

RESIDENCES

The Governor's Mansion, Jefferson City, Missouri
John D. Rockefeller, Jr., Estate, Pocantico Hills, N. Y.
Henry Ford, near Savannah, Georgia
Junior Chamber of Commerce Home, Birmingham, Alabama
Mrs. Horace Dodge Wilson, Detroit, Michigan
Elisha Walker, Syosset, Long Island, New York
Dickerson Estate, Brattleboro, Vermont
Kodak Realty Homes, Rochester, New York
A. L. Riley, Wilkes-Barre, Pennsylvania
S. N. Amster, Shaker Heights, Ohio

PUBLIC BUILDINGS

The Building of Italy, Rome, Italy
WWJ (Detroit News Radio Station), Detroit, Michigan
New York State Bathhouses, Saratoga Springs, New York
Hickman Memorial Home, West Chester, Pa.
Southwestern Bell Telephone Building, St. Louis, Missouri
U. S. Aerological Building, Los Angeles, Calif.
27 U. S. Army and U. S. Navy Barracks Bldgs.

HOTELS, CLUBS, THEATRES, APARTMENTS

19 East 72nd St. Apartments, New York City, N. Y.
Hotel Manila, Manila, P. I.
Hotel Astor, New York City, N. Y.
Greenbriar Hotel, White Sulphur Spgs., Virginia
Stevens Hotel, Chicago, Ill.
Broadway Mansions, Shanghai, China
Roxy Theatre, New York City, N. Y.
Hotel Isabel, Mexico City, Mexico
New Washington Hotel, Seattle, Washington
Hotel Dennis, Atlantic City, N. J.
Waldorf Apartments, Cincinnati, Ohio
Hotel Frontier, Cheyenne, Wyoming
Hotel Sylvan Lake, Rapid City, South Dakota
Merchants' Hotel, Moberly, Missouri
The Rahall Hotel, Beckley, West Virginia
Brentwood Village Apts., Washington, D. C.
Hotel St. Paul, St. Paul, Minn.
32 U. S. Government Housing Projects

UNIVERSITIES AND HOSPITALS

Notre Dame University, Notre Dame, Indiana
Columbia University, New York City
Creighton University, Omaha, Nebraska
Texas University, Austin, Texas
Yale University, New Haven, Connecticut
Duke University, Durham, North Carolina
John Carroll University, Cleveland, Ohio
Johns-Hopkins Hospital, Baltimore, Maryland
Allegheny General Hospital, Pittsburgh, Pa.
Fitzsimons General Hospital, U. S. Army, Denver, Colorado
U. S. Marine Hospital, Buffalo, New York
Maternity Hospital, Cleveland, Ohio

STEAMSHIPS

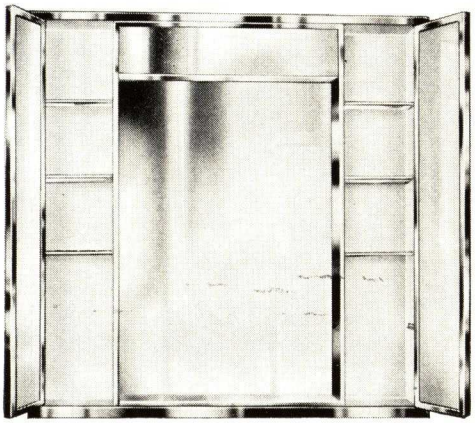
S. S. Manhattan, U. S. Line
S. S. George Washington, U. S. Line
U. S. Navy Warships
Chris-Craft Yachts and Cruisers

Presenting America's Newest

The IMPERIAL

Here is MIAMI'S latest development in Modern Bathroom Cabinets—an exclusive, distinctive DeLuxe Model for those of discriminating taste—the very finest cabinet that money can buy. The Imperial is distinguished by the skillful blending of Chrome and Glass. The frame around the entire cabinet is *brass, chromium plated*. Spacious side cabinets, one on each side of the large recessed mirror. have chromium framed mirror doors swung on *brass, chromium plated* piano-type hinges. Cabinets are finished inside in white *Crystal Snow* and are equipped with three glass shelves, *stainless steel* shelf supports and tooth brush holders. The shelf under the center mirror is white *vitrolite*.

The inside walls projecting outward from the center mirror are faced with mirrors that match the large center mirror.



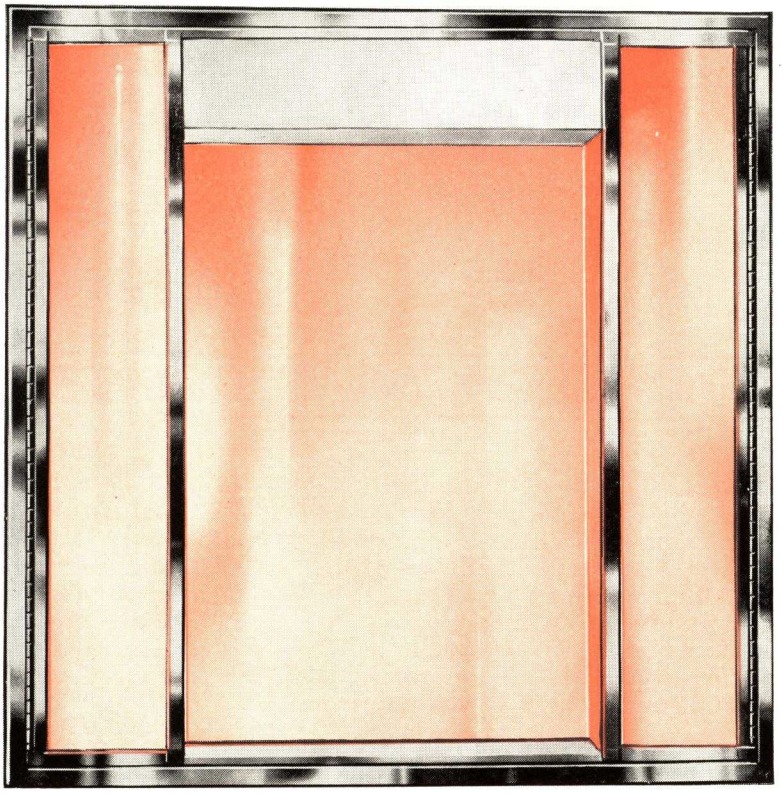
The "Imperial" with Side Cabinet Doors Open.

The lighting arrangement is indirect. Two light bulbs concealed behind the opal flash-glass panel at top of the center mirror provide perfect reflected light for shaving or dressing the hair. If fifty watt or larger bulbs are used, the light is sufficient to provide perfect illumination for the average bathroom. All wiring is completed at the factory.

Regular mirrors are "A" quality silver, *copper backed*, guaranteed for five years against silver spoilage. The new rose (or flesh) colored mirrors may be had if required.

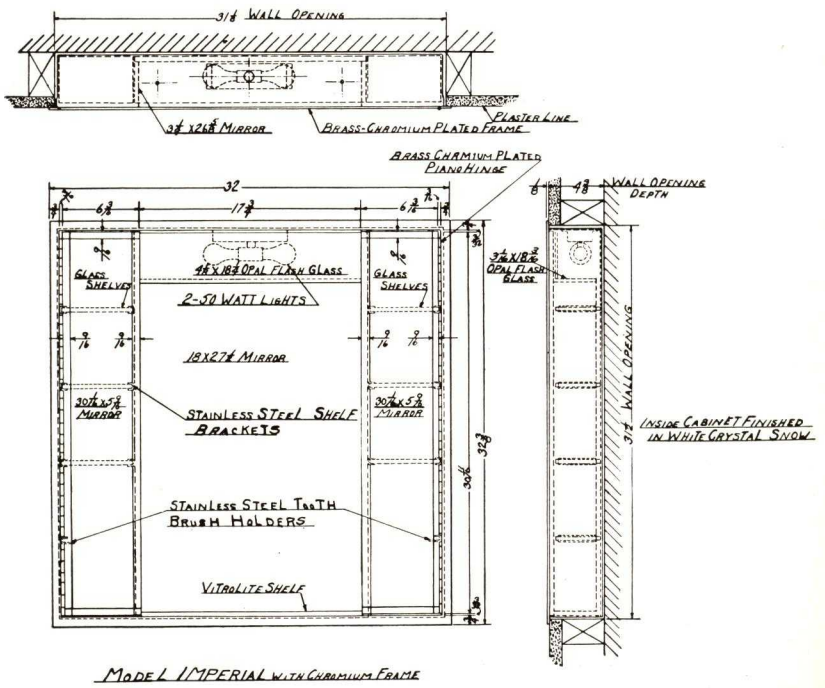
SPECIFICATIONS

Overall size	32"x32⅜"
Wall opening	31⅛"x31½"x4⅜"
Depth, front to back	4⅜"

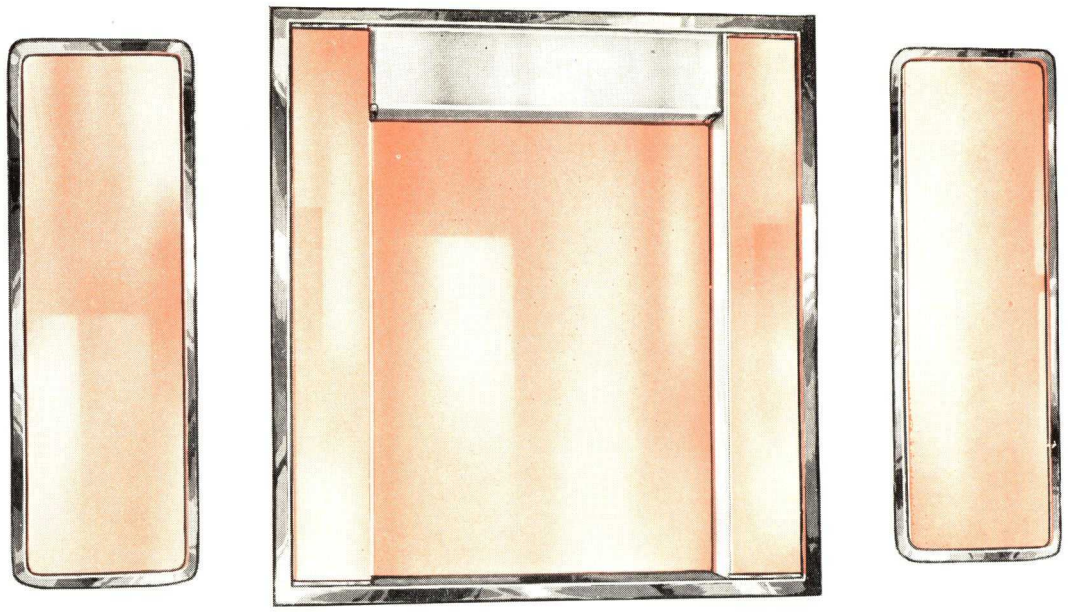


The "Imperial" with Side Cabinet Doors Closed.

The above illustration shows the Miami "Imperial" fitted with the new rose mirrors.



MODEL IMPERIAL WITH CHROMIUM FRAME



MIAMI LOUIS XIV BATHROOM CABINET . . . MIRROR ENSEMBLE

New, Different and Distinctive

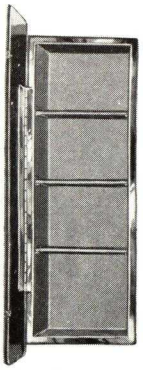
The Louis XIV unit is not merely a bathroom cabinet. but an ensemble of beautiful bathroom furniture. The flexibility of this ensemble is one of its most attractive features. If there is not sufficient wall space for the installation of all three units above the lavatory, the center unit, with its concealed light fixtures around the center mirror, may be installed over the lavatory and the individual side cabinets may be installed in the adjacent side walls (see catalog pages 16 and 17 for different installations).

DETAILS OF CONSTRUCTION

The center unit is a beautiful modern recessed mirror. There is no cabinet behind it. There is no door. The frame around the center unit is *brass, chromium plated*. The mirrors are genuine "A" quality plate glass, *copper backed*, guaranteed for five years against silver spoilage. The center mirror is the new rose (flesh) colored glass. Regular "A" quality silver mirror is optional. The small side mirror panels on the center unit are optional as to color—either rose (flesh), blue, gun metal, green or regular silver.

The lights concealed behind the white ground glass panel at the top of the center unit and behind the two narrow side mirrors are arranged so as to reflect proper illumination to the center of the mirror. Light is also reflected out into the room through the top front panel thus providing sufficient illumination for the average bathroom. Two 12-inch, 40-watt Lumaline lights are placed on each side of the center mirror. One 18-inch, 60-watt Lumaline light is located behind the ground glass panel directly above the large center mirror.

These bulbs will be furnished at extra cost if ordered. See price list for bulb cost. The wiring is complete at the factory.



Side Cabinet with Door Open

SIDE CABINETS

The two side cabinets are finished inside in Miami *Crystal Snow* white finish, guaranteed not to retain a stain nor to discolor with age. Three glass shelves are furnished with each cabinet.

The mirrors in the side cabinets are set in *brass, chromium plated* frames to match the frame of the center unit. These mirrors are the new rose (flesh) color. Regular silver mirrors are optional.

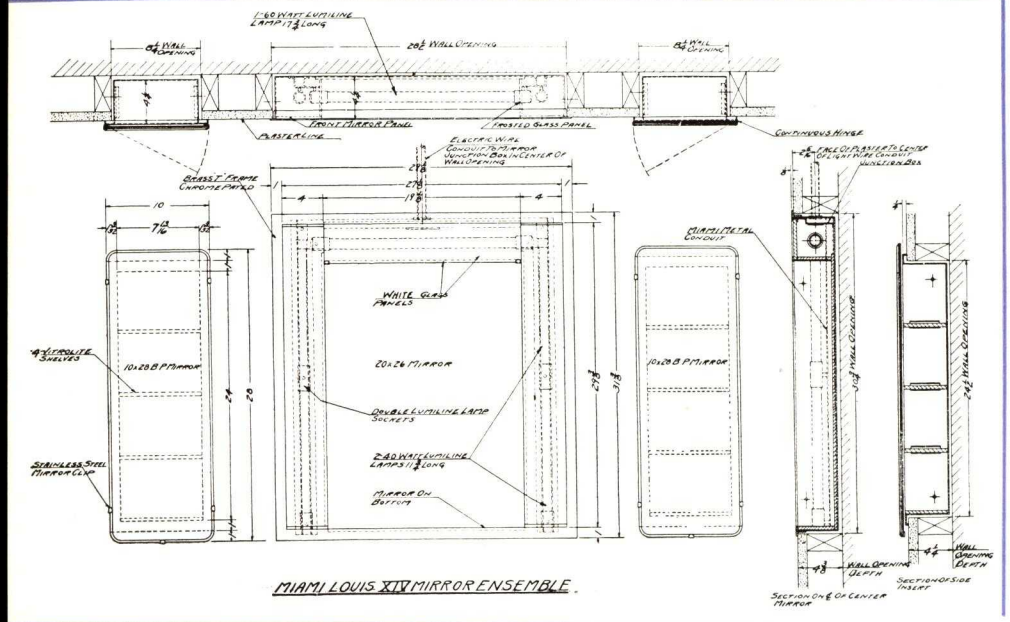
The door hinges are *bross, chromium plated* piano type.

SPECIFICATIONS

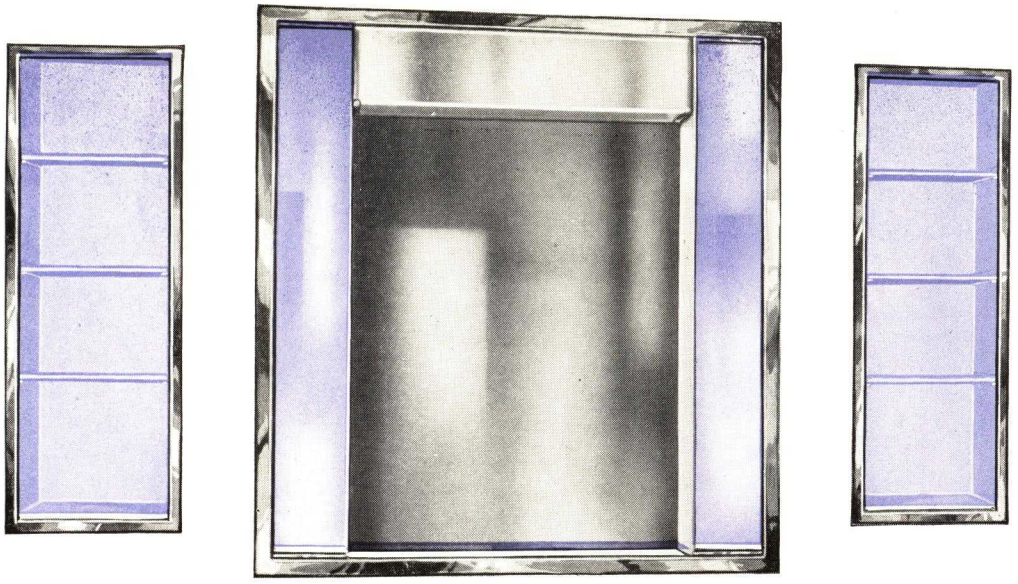
No return flanges on center unit. The side cabinets have one-quarter inch return flange.

When ordering, please specify:

1. Color of mirror for side cabinets, either rose (flesh) or regular silver.
2. Color of large mirror for center unit—rose (flesh) or regular silver.
3. Color of the two narrow side mirrors for the center unit—blue, green, gun metal, rose (flesh) or regular silver.
4. Specify whether light bulbs are to be furnished.



MIAMI LOUIS XIV MIRROR ENSEMBLE



MIAMI DUBARRY CABINET . . . MIRROR ENSEMBLE

A Masterpiece of Beauty, Convenience and Completeness

Lifetime beauty today, tomorrow and always—colorful, brilliant, modern—The DuBarry brings all of this to the bathroom. The beautiful center unit with its concealed lighting reflected onto the mirror and into the room is enhanced by the two open side cabinets. The deep lustre of Chromium combined with colored mirrors or regular silver mirrors presents the architect and home owner with opportunities they have never had before to create truly striking effects or to harmonize this complete unit with the general color scheme of the bathroom.

DETAILS OF CONSTRUCTION

The center unit consists of recessed mirror set in a *brass, chromium plated frame.* The concealed light fixtures are located behind ground glass panels at the top center and behind the narrow mirrors on both sides of the large center mirror. Perfect illumination for the entire bathroom and for shaving and dressing the hair is provided by four 12-inch, 40-watt Lumaline light bulbs, two on each side of the large center mirror and by one 18-inch, 60-watt Lumaline light bulb above the large center mirror. These five bulbs will be furnished, if ordered, at extra cost. See price list for cost. The unit is wired complete at the factory. See catalog pages 16 and 17 for suggested installations.

The large center mirror is optional as to color, either the new rose (flesh) or regular silver. The small narrow side mirrors of the center unit may be had in blue, green, gun metal, rose (flesh) or regular silver.

SIDE CABINETS

There are no doors on the side cabinets of the DuBarry. Cabinet frames are *brass, chromium plated.* Shelf brackets are *stainless steel.*

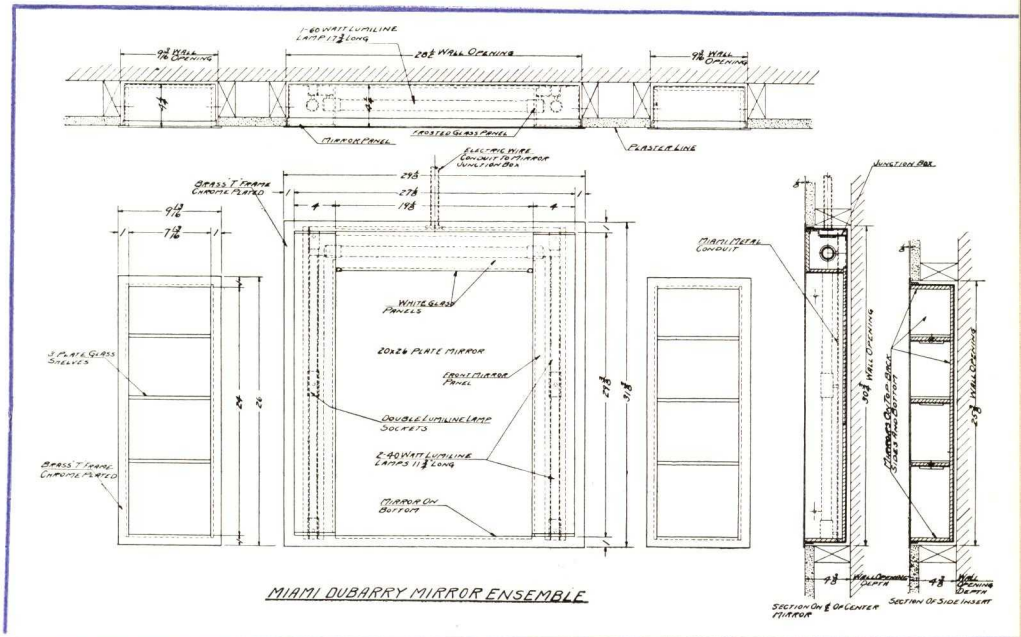
These cabinets are lined on the inside with mirrors, either blue, green, gun metal, rose (flesh) or regular silver. Three glass shelves to match the mirrors are furnished with each cabinet.

SPECIFICATIONS

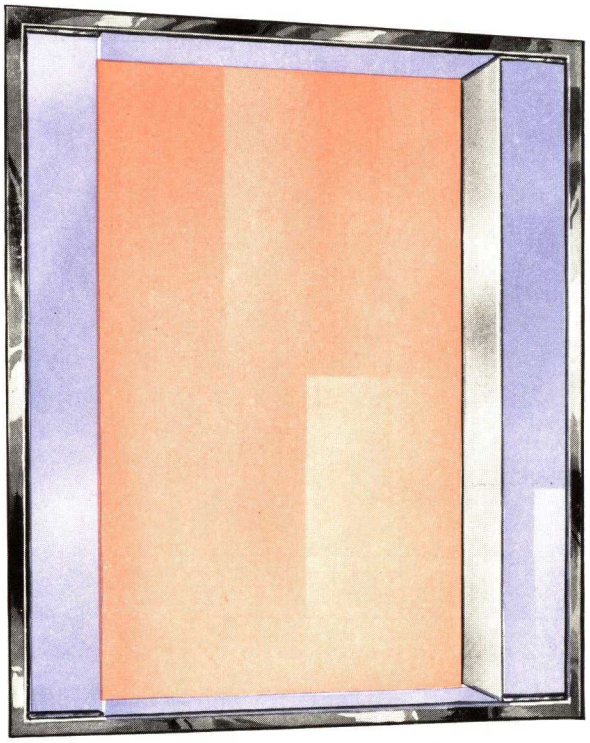
No return flange on the center or side units. When installed, all units set flush against the finished wall line.

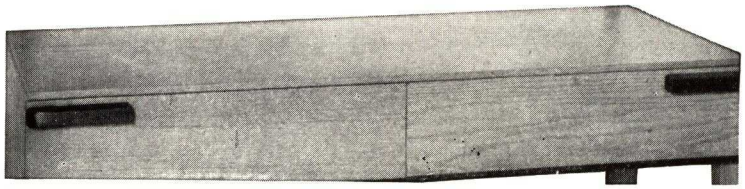
When ordering, please specify:

1. Color of large mirror—rose (flesh) or regular silver.
2. Color of narrow side mirrors in the center unit—blue, green, gun metal, rose (flesh) or regular silver.
3. Color of interior of the two side cabinets —rose (flesh), blue, gun metal, green or regular silver.
4. Specify whether light bulbs shall be furnished.



MIAMI DUBARRY MIRROR ENSEMBLE





The POWDER PUFF
Dressing Room Mirror

In the home of today, the Powder Room is almost as essential as was the bathroom in the house of the late nineties.

The custom-built Powder Puff unit, as illustrated, adds the final touch to the modern powder or dressing room. Architects, contractors and home owners have indorsed the Powder Puff as the most complete and distinctive dressing room unit yet offered to the public.

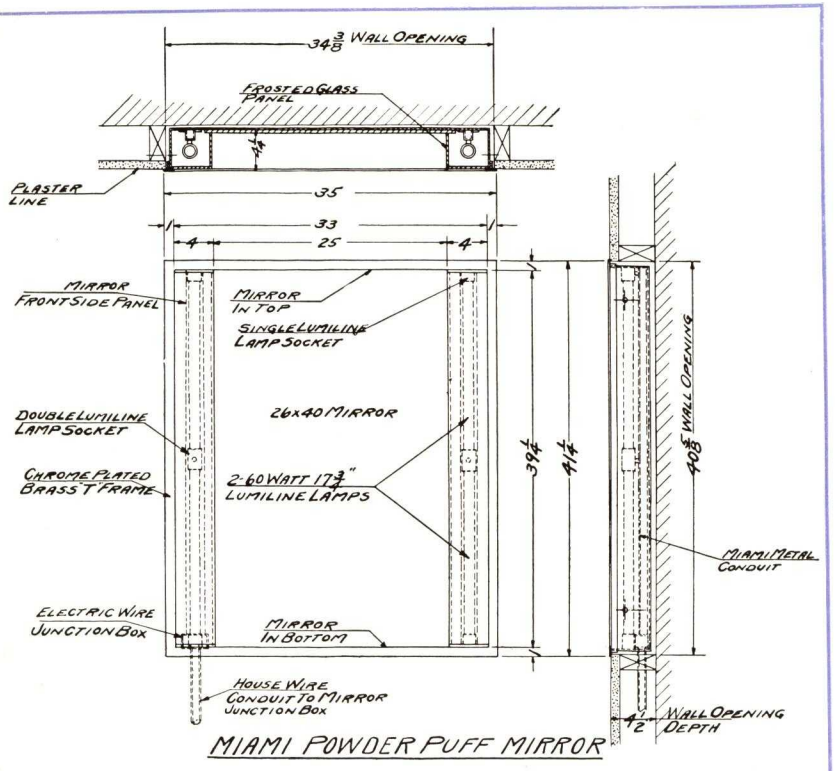
DETAILS OF CONSTRUCTION

The outside frame is *brass* finished in lustrous *chromium plate*. The large center mirror is genuine "A" quality plate glass in the new alluring rose (flesh) color. Regular "A" quality silver mirrors may be had if desired.

The small mirrors on either side of the large center mirror are optional as to color—either rose (flesh), gun metal, blue, green or regular silver. The recessed lower shelf may also be had in the same colors as the small side mirrors or in regular silver.

The light brackets are concealed behind the two small side mirrors and are so located that the light is reflected onto the large center mirror through ground glass panels. Four 18-inch, 60-watt Lumaline bulbs, two on each side of the center mirror, provide perfect illumination. These four bulbs will be furnished when ordered. See price list for extra cost.

When ordering, please specify color of mirrors desired.



MIAMI POWDER PUFF MIRROR

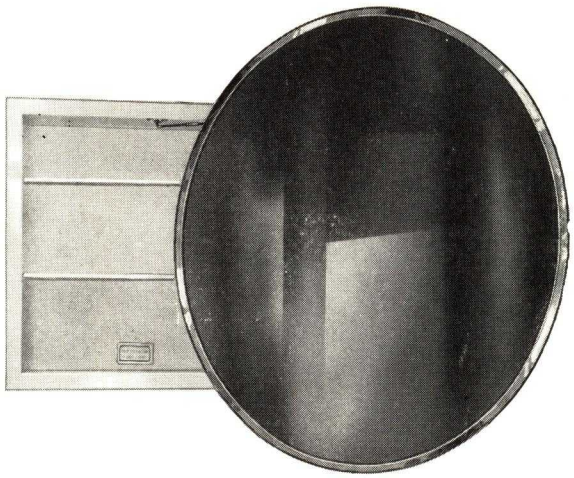
SPECIFICATIONS

Overall size	35″x41¼″
Wall opening	34⅜″x40⅝″x4⅜″
Depth, front to back	4⅜″

This unit is not fitted with a return flange. When set in the wall, the front flange sets flush against the finished wall line.

All wiring is completed at the factory.

The DUCHESS



Two years ago, Miami-Carey introduced the bathroom cabinet sensation of the year—the Moderne—a full sized cabinet fitted with a beautiful, circular mirror.

Today, Miami-Carey presents the Duchess, a practical cabinet similar to the Moderne but with the mirror set in a beautiful circular frame of *brass, chromium plated*, styled to match today's modern *chromium plated* bathroom fixtures and accessories.

The ingenious hinge on which the door is swung permits the door to be pulled outward over the lavatory so that when opened the mirror is only a few inches from the face—an ideal arrangement for shaving or dressing the hair.

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The MODERNE

The Moderne is similar to the Duchess, except that there is no frame around the mirror. The mirror is attached to the solid steel door with *stainless steel* mirror clips.

When installed in the wall, the *Moderne* and the *Duchess* look like beautiful circular mirrors hung on the wall. The illustration of the Pompadour below shows how both models appear when the door is closed.

The cabinet box of both the *Duchess* and *Moderne* is constructed of heavy gauge ARMCO steel. The return flange is one-quarter inch deep. The body and door backs are finished in *Miami Crystal Snow* finish, guaranteed not to retain a stain or to discolor with age. Two plate glass shelves, adjustable to three positions, are furnished.

The Miami *chromium plated* razor blade drop is installed in the back wall of the cabinet. Mirrors are "A" quality *copper backed*, guaranteed for five years against spoilage.

SPECIFICATIONS — THE DUCHESS and MODERNE

Mirror size ..... 26" circle
Wall opening ..... 16½"x16½"x4¼"

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The POMPADOUR

Circular Mirror and Recessed Shelf

The Pompadour, an ideal unit for guest bathroom, the downstairs lavatory or the dressing room, consists of a 26-inch circular mirror and glass lined recess shelf. There is no cabinet behind the circular mirror. Steel back on which the mirror is mounted is fitted for concealed hanging on the wall.

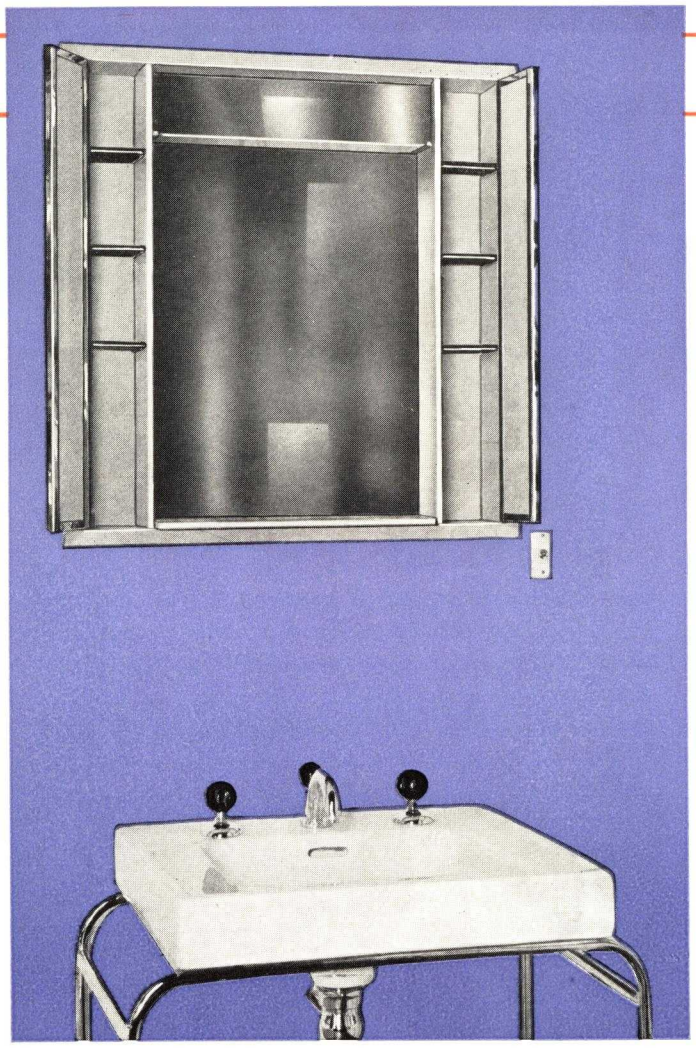
The frame around the lower recessed shelf is *brass, chromium plated*. The shelf itself is lined with mirrors. The colors available are blue, green, gun metal, rose (flesh) or regular silver. By using the proper colors in the lower shelf, beautiful effects can be worked out that will harmonize with bathroom color schemes.

The circular mirror is usually finished in regular silver. The new rose (flesh) color mirror is available at slight additional cost.

SPECIFICATIONS FOR LOWER SHELF

Wall opening ..... 23⅜"x7⅜"x4⅜"

When ordering, please specify color desired for recessed shelf—blue, green, gun metal, rose (flesh) or regular silver.



The OXFORD

Bathroom Cabinet

The Oxford, like the Imperial illustrated on page three, is as different from the regular run of bathroom cabinets as day is from night. It is modern, complete and distinctive. It is designed for the medium and smaller size bathrooms not large enough to accommodate the Imperial.

Color makes the bathroom of today attractive and alluring. The Oxford, finished in color to match bathroom tile, bathroom fixtures or the color scheme of the room, is the last word in perfection. The Oxford can be finished in any color desired at a slight additional cost. See price list for cost of special colors.

DETAILS OF CONSTRUCTION

Storage cabinets are located on each side of the center mirror. The door frames of the storage cabinets are *brass, chromium plated*. The shelves, three in each cabinet, are plate glass. The center mirror which is recessed and the mirrors in the two side cabinets are of "A" quality glass *copper backed*, guaranteed for five years against silver spoilage. The new rose (flesh) mirror may be had at slight additional cost.

The shelf brackets are finished to match the cabinet finish.

The two side storage cabinet doors are swung on *brass, chromium plated* piano hinges. The frame around the entire unit and the side panels is regularly finished in white *crystal snow*.

The lower shelf under the center mirror is white *vitrolite*.

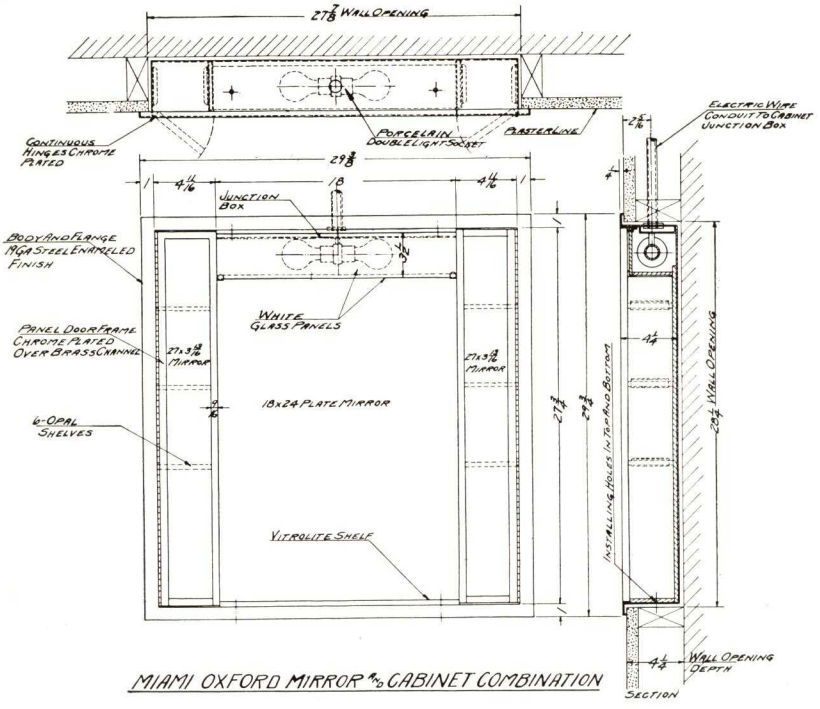
The light brackets concealed behind the white ground glass panel at the top center of the cabinet are arranged so as to reflect light onto the center mirror, thus providing perfect illumination for making the toilet. Light is also reflected out into the room through the front panel and provides sufficient illumination for the average bathroom. Bulbs of any wattage up to 75 watts may be used.

The wiring is complete at the factory and is in accordance with Underwriters' regulations.

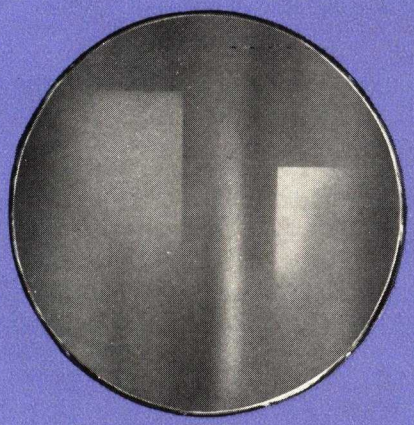
SPECIFICATIONS

Overall size	29⅜" x 29¾"
Wall opening	27⅞" x 28¼" x 4¼"
Depth, front to back	4¼"
Return flange	¼"

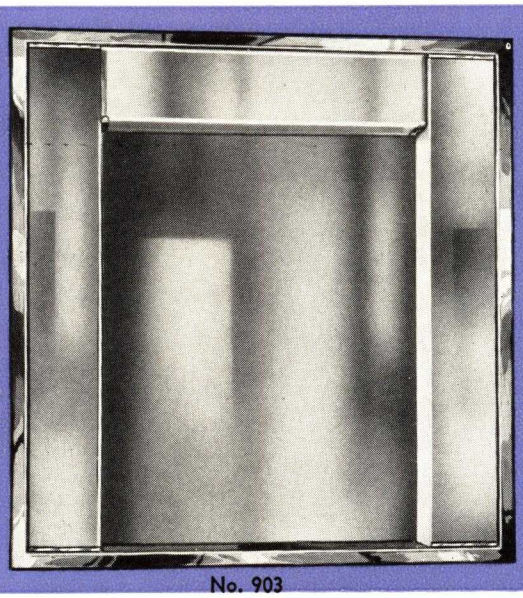
When ordering, please specify color in which the cabinet frame and side panels are to be finished. Also specify whether regular silver or rose color mirrors are desired.



MIAMI OXFORD MIRROR & CABINET COMBINATION



No. 902



No. 903

MIAMI BATHROOM MIRRORS and ACCESSORIES

When ordering any of the units on this page, be sure and specify color of mirror wanted.

No. 902—26″ Circular Mirror—Fitted with concealed hanging device for hanging on the face of the wall. This beautiful "A" quality mirror is *copper-backed*, guaranteed for five years against silver spoilage. This is an ideal unit for installation in the small dressing room, for the entrance hall or Milady's boudoir, also for hanging above the mantel in the living room. Unless otherwise specified, the mirror is furnished in regular silver. The new rose (flesh) mirror is available at slight additional cost. See specifications at bottom of page.

No. 903—Recessed Mirror—For bathrooms or dressing rooms where a cabinet is not required. Soft light is reflected through ground glass panels onto the beautiful center mirror and also illuminates the entire room. Rose (flesh) or regular silver mirror is optional for center panel. Side mirrors in blue, gun-metal, green or rose color. The frame around the entire unit is *brass, chromium plated.* Light arrangement and wiring is in strict accordance with Underwriters' regulations. See specifications at bottom of page.

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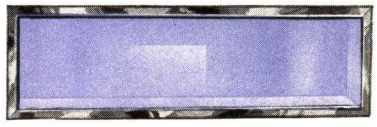
The individual units illustrated on this page permit a wide choice in expressing individual ideas of beauty and distinction. These units, for the first time in bathroom cabinet history, give the architect and the home owner the opportunity to make up combinations that will meet the requirements of the individual bathroom.

No. 900

No. 900 — Doorless Recessed Shelf Cabinet— For installation wherever a colorful nook is desired. The frame is *brass, chromium plated.* The interior of the unit is lined with beautiful colored mirrors. Colors—blue, rose, gun-metal, green and regular silver. Shelves are clear glass, colors corresponding with color selected for the mirror. See specifications at bottom of page.

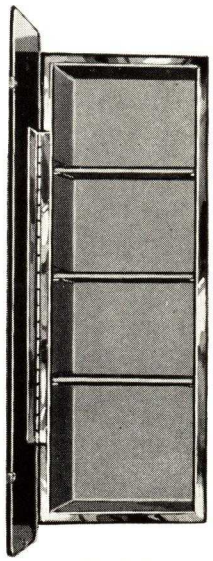


No. 904

No. 904—Mirror Lined Recess Shelf—Suitable for bathrooms and dressing rooms where a cabinet is not required. This unit combined with Model 903, illustrated on this page, is an ideal combination for installation in guest bathrooms or dressing rooms. The shelf is lined with beautiful colored mirrors, blue, green, gun-metal, rose or regular silver. See specifications at bottom of page.

No. 901—Extra Cabinet for Bath room — May also be used for dressing room or bed room. The all-mirror door covers the entire cabinet and has a *brass, chromium plated* frame. Mirror is "A" quality glass, rose color or regular silver. Hinges are piano type, *brass, chromium plated.*

Interior of cabinet is finished in white *Crystal Snow*, guaranteed not to retain a stain. Shelves are plate glass. See specifications below.



No. 901

SPECIFICATIONS

Model	900	901	902	903	904
Mirror	none	10″x28″	26″	20″x26″	none
Overall	$9\frac{13}{16}$″x26″	$10\frac{1}{4}$″x$28\frac{1}{4}$″	26″	$29\frac{1}{8}$″x$31\frac{3}{8}$″	24″x8″
Wall opening	$9\frac{3}{16}$″x$25\frac{3}{8}$″x$4\frac{3}{8}$″	$8\frac{1}{4}$″x$24\frac{1}{2}$″x$4\frac{1}{4}$″	none	$28\frac{1}{2}$″x$30\frac{3}{4}$″x$4\frac{3}{8}$″	$23\frac{3}{8}$″x$7\frac{3}{8}$″x$4\frac{3}{8}$″

TOWEL SUPPLY and UTILITY CABINETS

It is an acknowledged fact that the average bathroom cabinet is not large enough to accommodate all of the home remedies, toilet accessories, razors, medicines and first aid necessities kept or used by the average American family. With this in mind, Miami-Carey presents the towel storage and utility cabinets illustrated on this page.

MODELS 510-A and 510-B

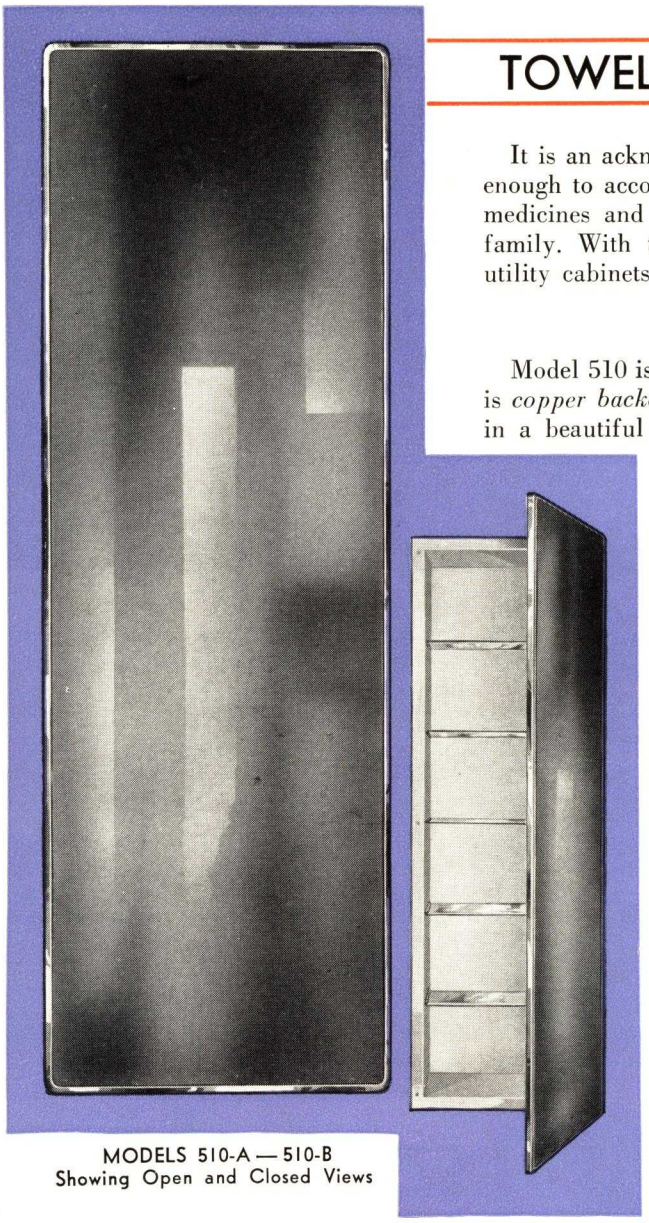
Model 510 is designed for the luxurious bathroom. The "A" quality mirror is *copper backed*, guaranteed for five years against silver spoilage. It is set in a beautiful *chromium plated* frame. The heavy, air cushioned door is swung on a *brass, chromium plated* piano hinge.

The cabinet and door back are finished in *Miami Crystal Snow* white finish, guaranteed not to retain a stain nor to discolor with age. Five glass shelves are furnished with each cabinet.

In addition to providing for extra storage space in the bathroom, the mirrored door of this unit serves at the same time as a full length bathroom mirror.

SPECIFICATIONS

	Model 510-A	Model 510-B
Mirror	20″x60″	20″x60″
Wall opening	17¾″x57¾″x8″	17¾″x57¾″x6″
Overall	20¼″x60¼″x8⅝″	20¼″x60¼″x6⅝″



MODELS 510-A — 510-B
Showing Open and Closed Views

MODEL 500

Model 500, a smaller unit, is designed and constructed for the less pretentious bathroom where extra storage space is also required.

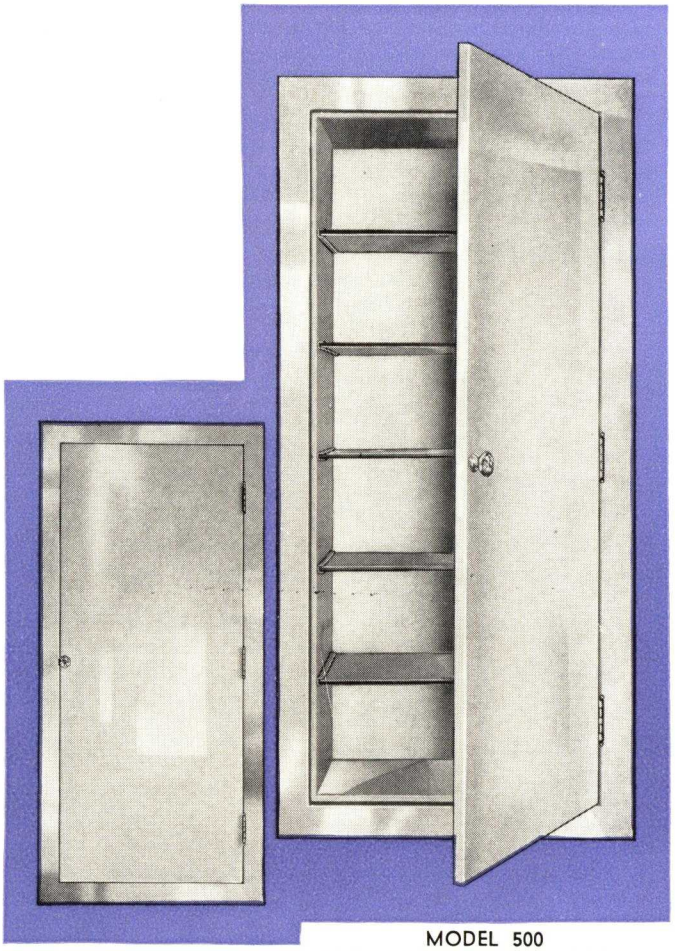
The entire cabinet, including the door, is constructed of ARMCO selected steel.

Five glass shelves are furnished.

The door is swung on three *brass, chromium plated* hinges. There is no mirror in the door. The cabinet is finished in Carey first quality *baked enamel* applied over rust resisting undercoat. White is the regular finish. The unit may be had in any color desired to match tile or other finishes. See price list for extra cost of special colors.

SPECIFICATIONS

Door	14⅝″x34⅜″
Wall opening	14¾″x34½″x6″
Overall	18″x37¾″x6¾″



MODEL 500
Showing Open and Closed Views

MIAMI CABINETS WITH CHROMIUM-FRAMED MIRRORS

Venetian Styles

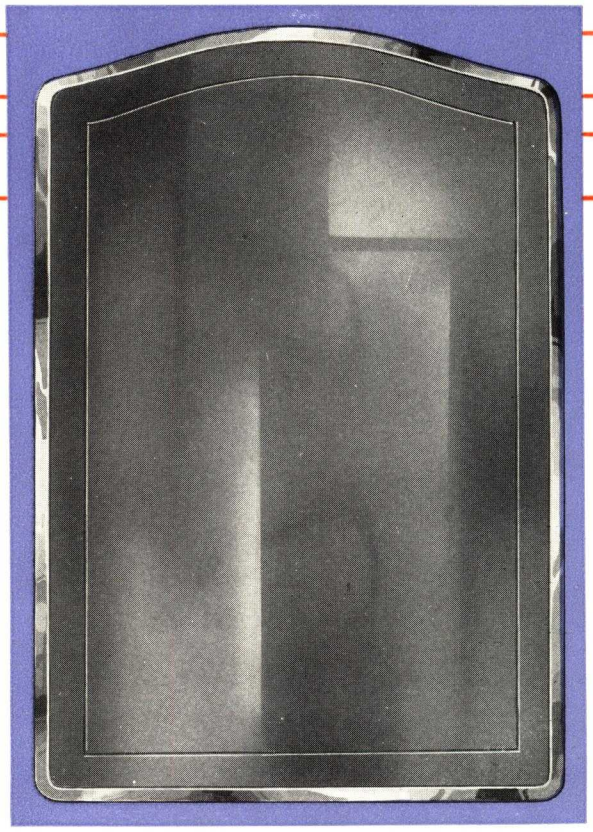
The deep brilliant lustre of chromium adds attractiveness to the modern bathroom, so that today we find almost all the bathroom fittings and accessories finished in chromium plate.

To keep pace with the trend of bathroom design and decoration, our craftsmen designed the Chrome Framed models illustrated on this page. They are beautiful cabinets with no knob, hardware or portion of the body visible. The one-piece mirror frames are brass with the chromium applied over nickel.

The one-piece frame used on all models illustrated on this page eliminates the necessity of ugly corner clips commonly used to cover up open joints. The cabinet body and door back are finished in the famous Miami *Crystal Snow*, noted for its durability.

The heavy *chromium plated* piano hinges are capable of carrying many times the weight of the door—yet they are neat in appearance and are not visible when the door is closed.

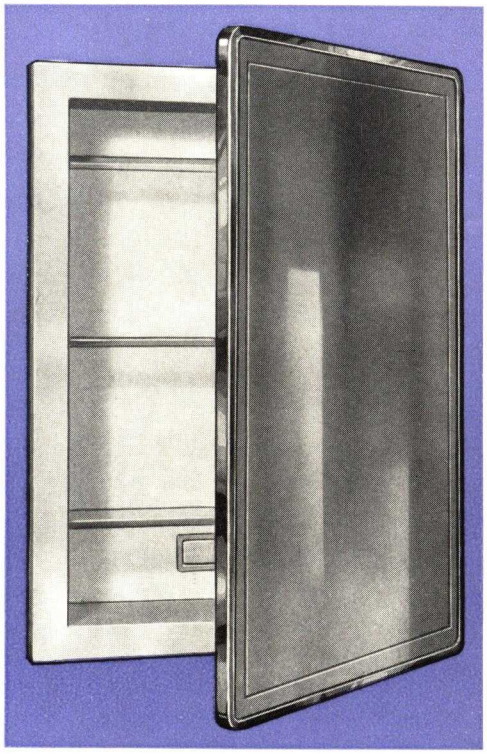
Regular equipment: "A" quality *copper-backed* mirror, three plate glass shelves, drop for used razor blades, tooth brush racks.



Nos. 1000, 1050, 1075

SPECIFICATIONS

	1000	1050	1075
Overall	16¼"x26¼"	18¼"x28¼"	20¼"x32¼"
Mirror	16"x26"	18"x28"	20"x32"
Wall opening	13¾"x19¾"x4¼"	15¾"x21¾"x4¼"	17¾"x25¾"x4¼"
Return flange	¼"	¼"	¼"



Nos. 1100, 1150, 1175

MASTER MODELS

The Master Models illustrated at the left have the same specifications as the Venetian style illustrated above. These models are suggested for the bathroom where straight lines are required.

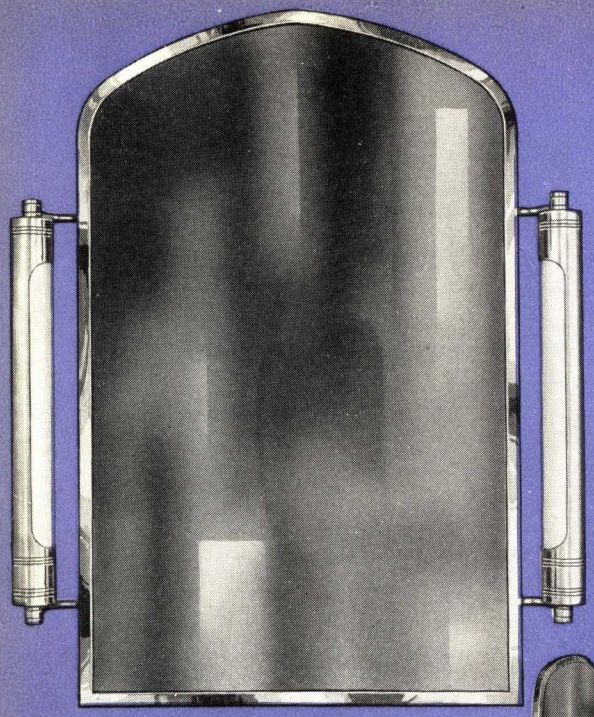
The two bottom shelf supports on all models on this page are so designed that they can be used as tooth brush racks. This arrangement does not interfere with the use of the bottom shelf brackets for the support of the shelf if the tooth brush rack is not required.

The Master model is available in three sizes as listed below.

SPECIFICATIONS

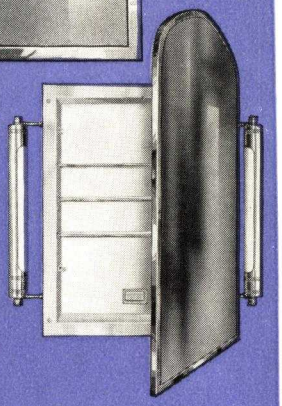
	1100	1150	1175
Overall	16¼"x22¼"	18¼"x24¼"	20¼"x28¼"
Mirror	16"x22"	18"x24"	20"x28"
Wall opening	13¾"x19¾"x4¼"	15¾"x21¾"x4¼"	17¾"x25¾"x4¼"
Return flange	¼"	¼"	¼"

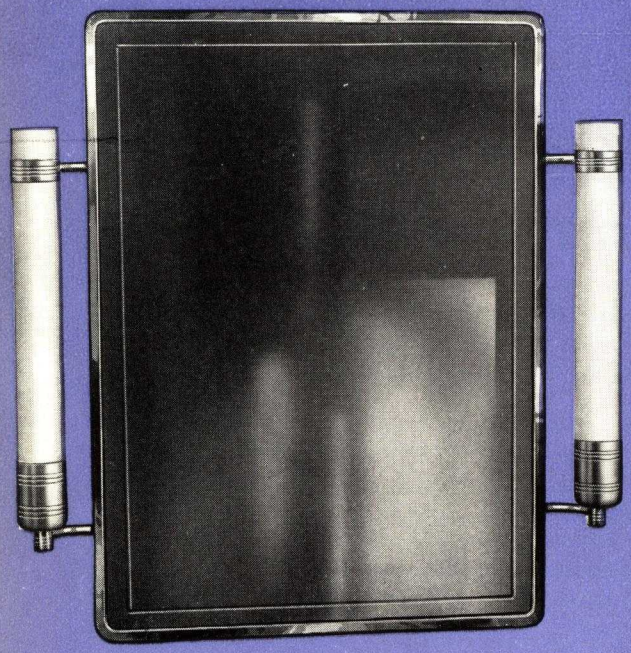
TUBULAR LIGHT BRACKETS



TUBULAR LIGHT BRACKET No. 1

The above illustration shows one of the larger models fitted with Tubular Light Brackets No. 1. We recommend that Bracket No. 1, because of its size, be used on the following cabinets: 1050, 1075, 1150, 1175, 150, 710, 750, 2010-P, 2020-P, 2040-P, 2050-P, 610-G, 620-G, 650-H, 670-F.





TUBULAR LIGHT BRACKET No. 2

These Brackets are available for all cabinets illustrated on pages 11, 14, 20, 21 and 23; also for all cabinets illustrated on page 22, except Model 700. The fixture is designed to take a T-8 bulb, either 40 or 60-watt. This bulb is available at all electric stores.

Miami and Carey Cabinets fitted with the attractive light fixtures illustrated on these pages bring new beauty to your bathroom lighting at an attractive saving in cost. The light brackets illustrated on these pages are correctly located so as to concentrate the light at the point where it is most needed and yet provide sufficient illumination for the entire bathroom.

The solution to effective bathroom lighting has never before been approached as Miami-Carey approached it —building fixtures to meet the artistic, exacting demand for beauty of line, the interior decorator's desire for harmony, and the architect's insistence on the practical.

Tubular Light Brackets 1, 3 and 4 are new and distinctive — exclusive with Miami. The chromium plated shields around the light bulbs are adjustable in all arcs of a 180° angle, thus permitting the light to be directed onto the mirror, out into the room or to any intermediate degree desired.

TUBULAR LIGHT BRACKET No. 2

The photograph at the left illustrates a Miami-Carey Cabinet fitted with the new and modern Tubular Light Bracket No. 2. These Brackets do not have the adjustable chromium plated shields. The glass shade is opal.

We suggest a Miami-Carey Cabinet fitted with either Tubular Light Brackets No. 1 or No. 2 for the large bathroom. For the medium sized and smaller bathroom, we suggest cabinets fitted with either Tubular Light Brackets Nos. 3 or 4.

SPECIFICATIONS

All light fixtures are mounted on the cabinets at the factory, all wiring approved by the Underwriters' Laboratories.

We do not furnish light bulbs for cabinets fitted with Tubular light fixtures.

For cabinets fitted with light fixtures, make the wall openings one inch higher than is specified for cabinet not fitted with light fixtures. Example: Cabinet Model 1000 not fitted with light fixtures, wall opening 13¾ x 19¾ inches high. Wall opening for the same cabinet fitted with light fixtures, 13¾ x 20¾ inches high.

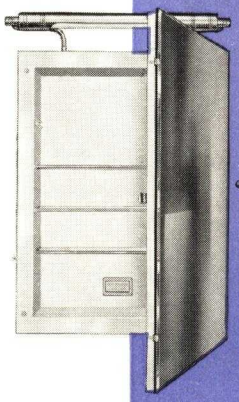
See price list for list price of cabinets fitted with light fixtures.

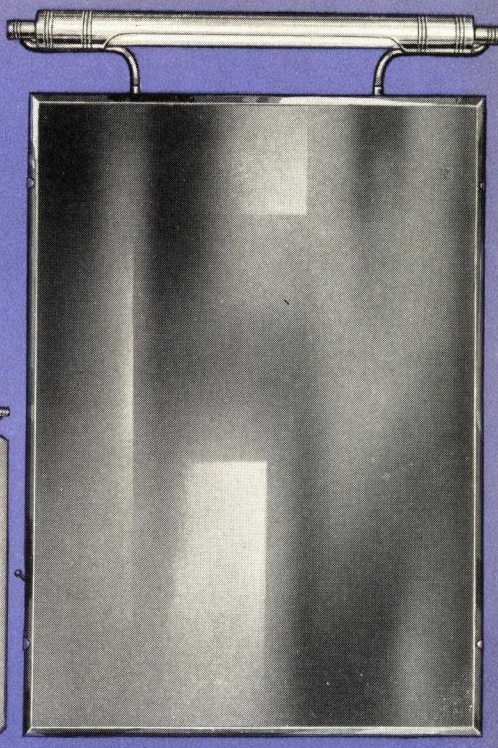
for MIAMI-CAREY CABINETS

OVERHEAD TUBULAR LIGHT BRACKET No. 4

The photograph to the right illustrates a square top cabinet fitted with a single overhead Tubular Light Bracket. This type of installation is recommended for the small bathroom, for the downstairs lavatory and for the low cost home where perfect illumination of the bathroom is as essential as in the more costly home.

This single overhead light fixture is available for the following cabinets: Nos. 1100, 640, 650, 2030-P, 2040-P, 2050-P and for all models on page 23.

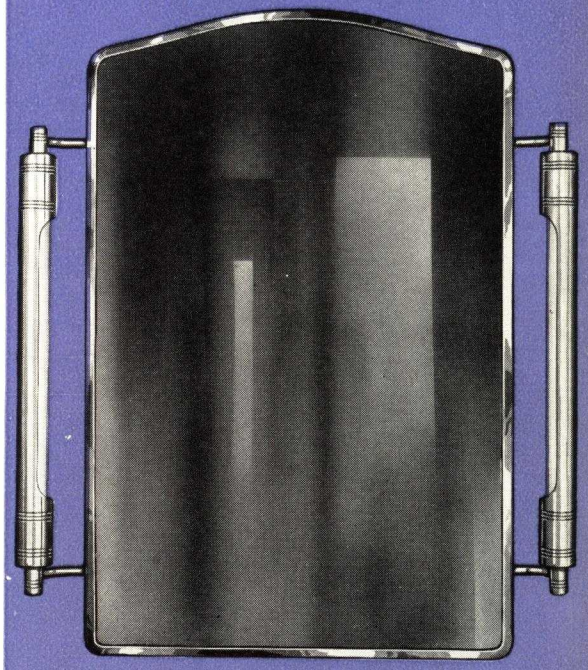




OVERHEAD TUBULAR LIGHT BRACKET No. 4

TUBULAR LIGHT BRACKET No. 3

Similar in appearance to bracket No. 1, but smaller in diameter. Designed to take a T-8 frosted bulb, either 40 or 60-watt. This bulb is available at all electric shops. There is no glass shield over the bulb. The frosted light bulb itself serves the purpose. Recommended for cabinets: 1000, 160, 1100, 2030-P, 660-F, 701-F, 1622-BF, 1622-CF and for all models on page 23.

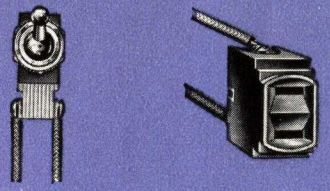


TUBULAR LIGHT BRACKET No. 3

SWITCH AND OUTLET

All cabinets ordered with light brackets attached are fitted with switch and electric convenience outlet as illustrated in lower right corner of this page. These are located on the return flanges of the cabinets.

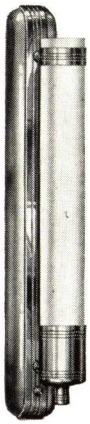
Only one electric outlet is necessary for the bathroom in which an electrically equipped Miami Cabinet is installed. This strictly in top center of the wall opening provided for the cabinet.



SWITCH AND OUTLET

DISTINCTIVE LIGHT FIXTURES

For Wall Mounting



Model 7000

These new and distinctive Tubular and Lumaline light fixtures were designed for Miami by illuminating engineers — for the bathroom, kitchen, sun room, breakfast nook and the dressing room.

Model 7000, illustrated on the left, is known as the Tubular design. Standard Mazda lamps T-8, either 40 or 60-watt, are required. These lamps are not furnished. They may be purchased in any electric store.

Model 8000, illustrated on the right, is known as the Lumaline design. The bulb is the new Lumaline bulb. This bulb is furnished by us. Replacements may be purchased at any electric store.

Switches that control the lights are built into each bracket. Both brackets are finished in lustrous chromium plate.

Model 8000

Nos. 770, 780

VENETIAN MODELS

With Side Wings

In this model beauty and utility are combined to an unusual degree to provide a cabinet that meets the requirements of the most exacting. The adjustable wing mirrors permit perfect vision of the head, back and shoulders, a perfect mirror arrangement for shaving or dressing the hair. Used over the dressing table, the unit makes an attractive and practical vanity.

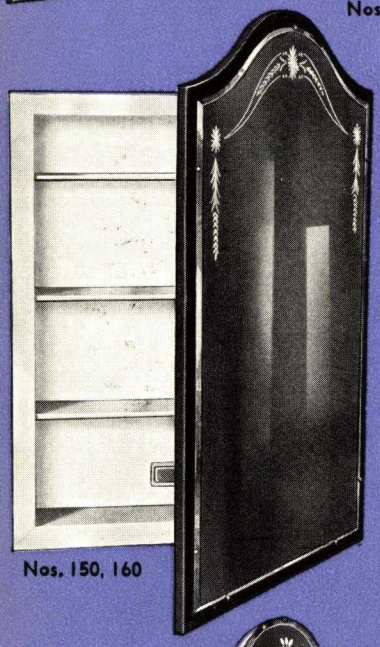
No portion of the cabinet is visible from the front. The entire front of the unit is covered with mirrors. The cabinet is concealed behind the large center mirror.

"M" mirror shown at left is regularly furnished on 770 and 780. See Page 15 for optional style mirrors available.

Regular equipment: *Copper-backed* **"A"** quality mirrors, guaranteed for five years against silver spoilage; three adjustable plate glass shelves; drop for used razor blades; tooth brush racks. The hinges are *brass, chromium plated* semi-piano type. The cabinet is finished in Miami *Crystal Snow*. Mirror clips are *stainless steel*.

SPECIFICATIONS

	780	770
Overall	34½″x28″	32½″x26″
Center Mirror	18″x28″	16″x26″
Wing Mirrors	8″x24″	8″x22″
Wall opening	15¾″x21¾″x3½″	13¾″x19¾″x3½″
Return flange	1″	1″



Nos. 150, 160

PANEL VENETIANS

These outstandingly beautiful and distinctive Miami cabinets are indeed suitable for the bathrooms of royalty. Illustration at left shows the "W" mirror. See page 15 for other style mirrors available. The Roman Model 160 is regularly fitted with the "K" mirror. These regular mirrors will be furnished unless otherwise specified.

Regular finish: Body of cabinet white *Crystal Snow*. Cabinet door black as shown.

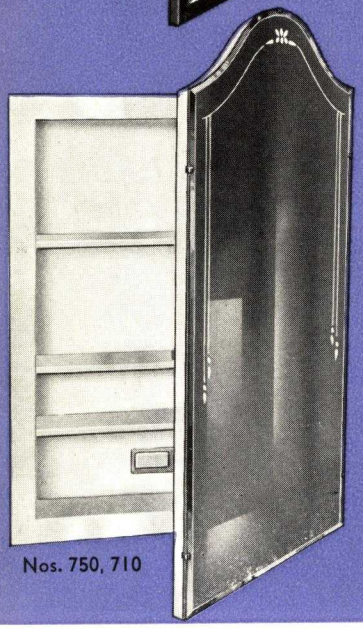
Regular equipment: Full piano hinge, used razor blade drop, three adjustable plate glass shelves, tooth brush racks.

COLOR

Color makes the bathroom interesting, attractive, refreshing, beautiful. The color appeal can be carried even to the Miami Cabinet over the lavatory at a small additional cost. These panel Venetian models regularly lend themselves to color matching because of the panel around the edge of the mirror. We are prepared to match these cabinets to any color required.

SPECIFICATIONS

	150	160
Overall	19¾″x29¾″	15¾″x29¾″
Mirror	18″x28″	14″x28″
Wall opening	17½″x23½″x4¼″	13½″x23½″x4¼″
Return flange on these models is ¼ inch.		



Nos. 750, 710

MIRROR FRONT VENETIANS

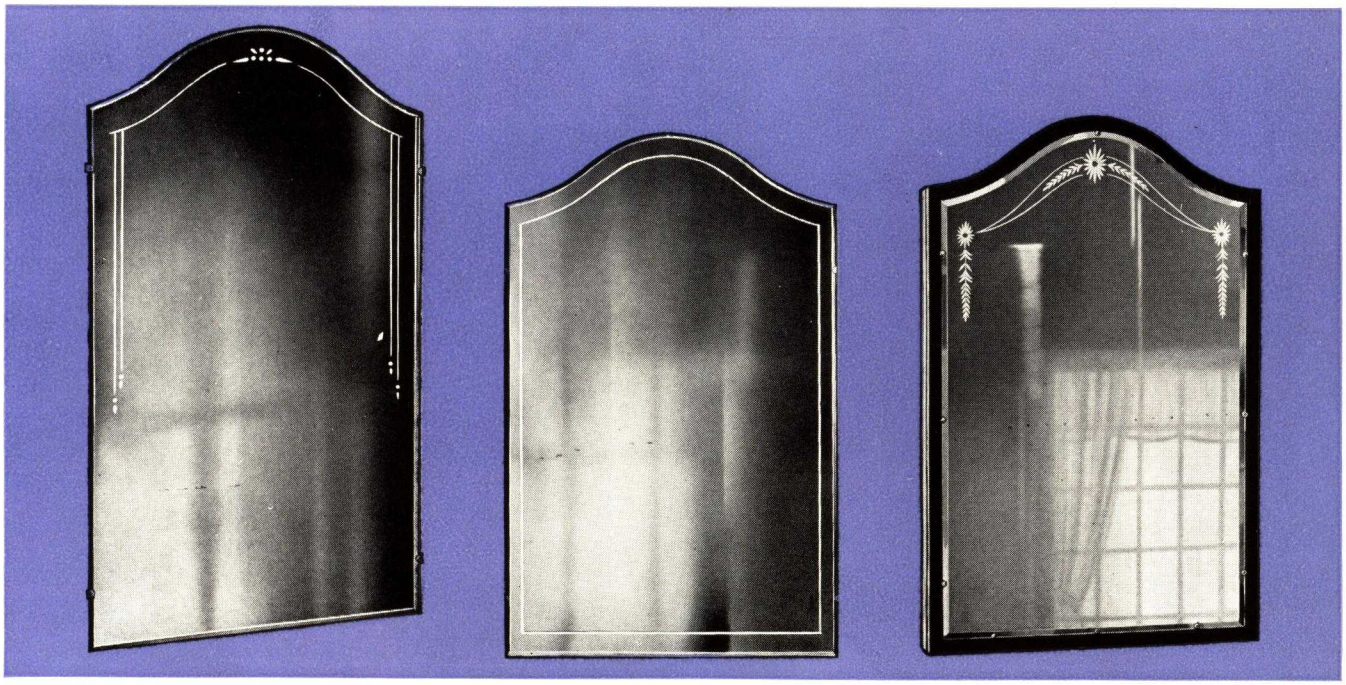
The models illustrated on the left were designed for those whose requirements call for simplicity of design. The mirror shown is the "H" design. See page 15 for other available mirrors.

Set in the wall, these models resemble unusually handsome mirrors. No knob, hardware or portion of the cabinet is visible to indicate that a spacious cabinet is hidden behind the door. The "A" quality, *copper-backed* mirror is hung on the door with the patent Miami *stainless steel* mirror clips lined with soft lead. The extra large mirror on the Model 750 (18x30 inches) is Miami's answer to the request for larger mirrors.

Regular equipment: *Copper-backed* mirror guaranteed for five years against silver spoilage; adjustable plate glass shelves; *stainless steel* shelf supports; drop for used razor blades; tooth brush racks. The hinges are piano type, *brass, chromium plated.*

SPECIFICATIONS

	750	710
Overall	18″x30″	16″x26″
Mirror	18″x30″	16″x26″
Wall opening	15¾″x21¾″x4¼″	13¾″x19¾″x4¼″
Return flange	¼″	¼″



"H" MIRROR
Regular on Models 750, 710. Available for Models, 150, 780, 770.

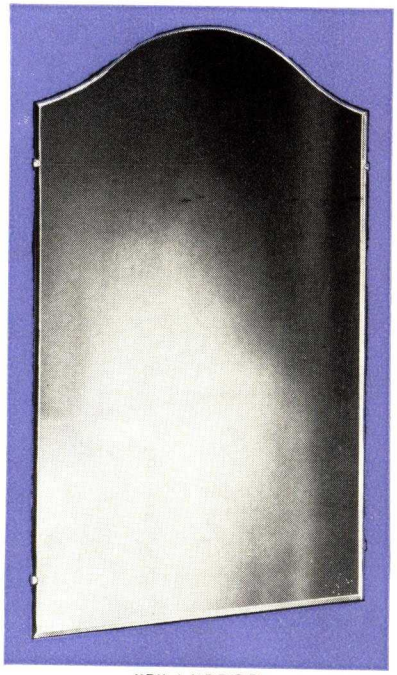
"M" MIRROR
Regular on Models 780, 770. Available for Models 150, 750, 710.

"W" MIRROR
Regular on Model 150. Available for Models 750, 780.

MIAMI CABINET MIRRORS

Available for the Panel and Venetian Models with All-Mirror Door

Mirrors illustrated on this page are interchangeable with others and may be substituted for the mirrors illustrated on various models as designated under each illustration on this page.



"P" MIRROR
Available for all models on Pages 11, 14, 20, 21, 22.

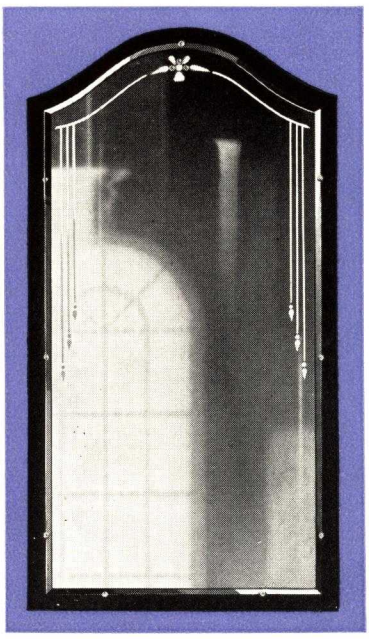
HOW TO SPECIFY MIRROR WANTED

The letters under the mirror illustrations on this page are factory symbols to designate the different mirror designs available for the cabinets in the Miami Line. These same letters are used opposite the model numbers in the price list.

When ordering, be sure to specify the type of mirror required.

Example: If you want a 710 cabinet equipped with the mitered line mirror, order Model 710-M.

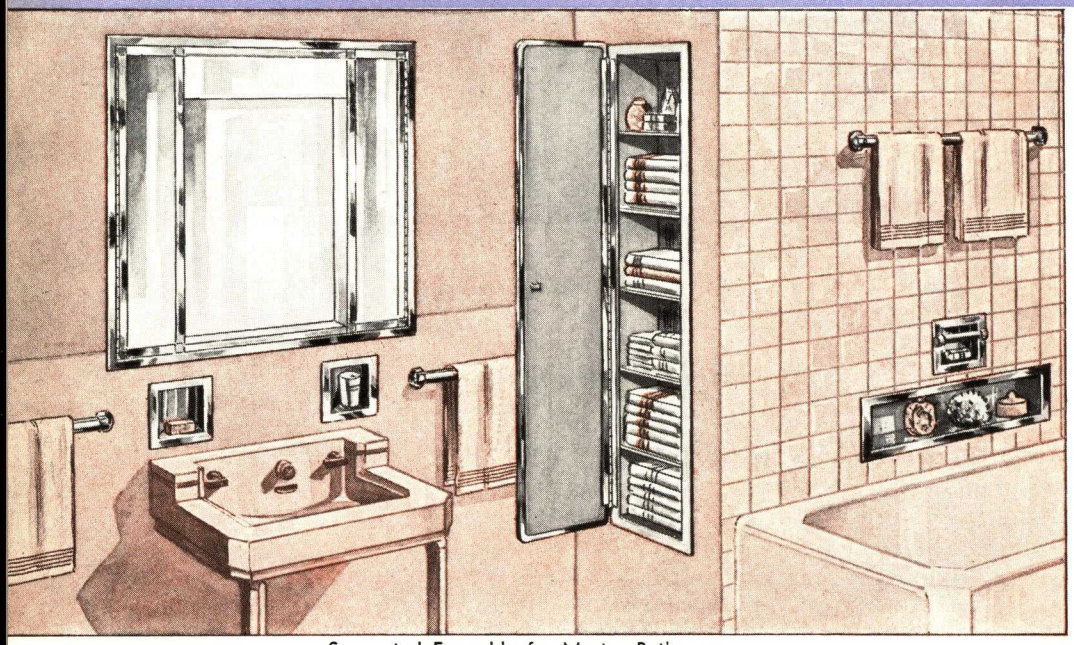
All these mirrors are "A" quality genuine plate glass, *copper backed*, guaranteed for five years against silver spoilage.



"K" MIRROR
Regular for Model 160-K.

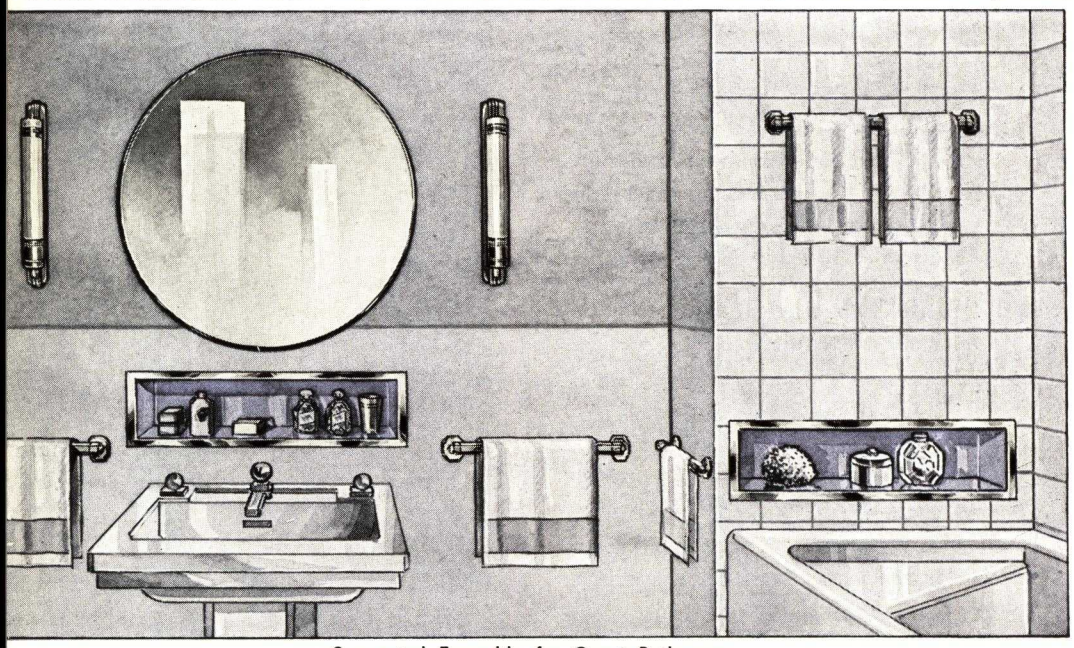
MIAMI CAB

GLORIFY YOUR BATHR



Suggested Ensemble for Master Bathroom

Imperial Cabinet. Large towel supply cabinet No. 510-A with all-mirror door framed in brass chromium plate. No. 6000 soap holder and No. 6001 tumbler holder. No. 5002 towel bars. Unit No. 904 mirror-lined, recessed shelf; No. 6004 soap holder.



Suggested Ensemble for Guest Bathroom

Pompadour combination consisting of round mirror and No. 904 mirror-lined recess shelf. Two tubular light fixtures No. 7000. Three No. 5001 towel bars. No. 5002 towel bar. Unit No. 904 mirror-lined recess shelf.

On these pages we present a few examples which suggest the many combinations in which Miami-Carey Units may be installed to advantage.

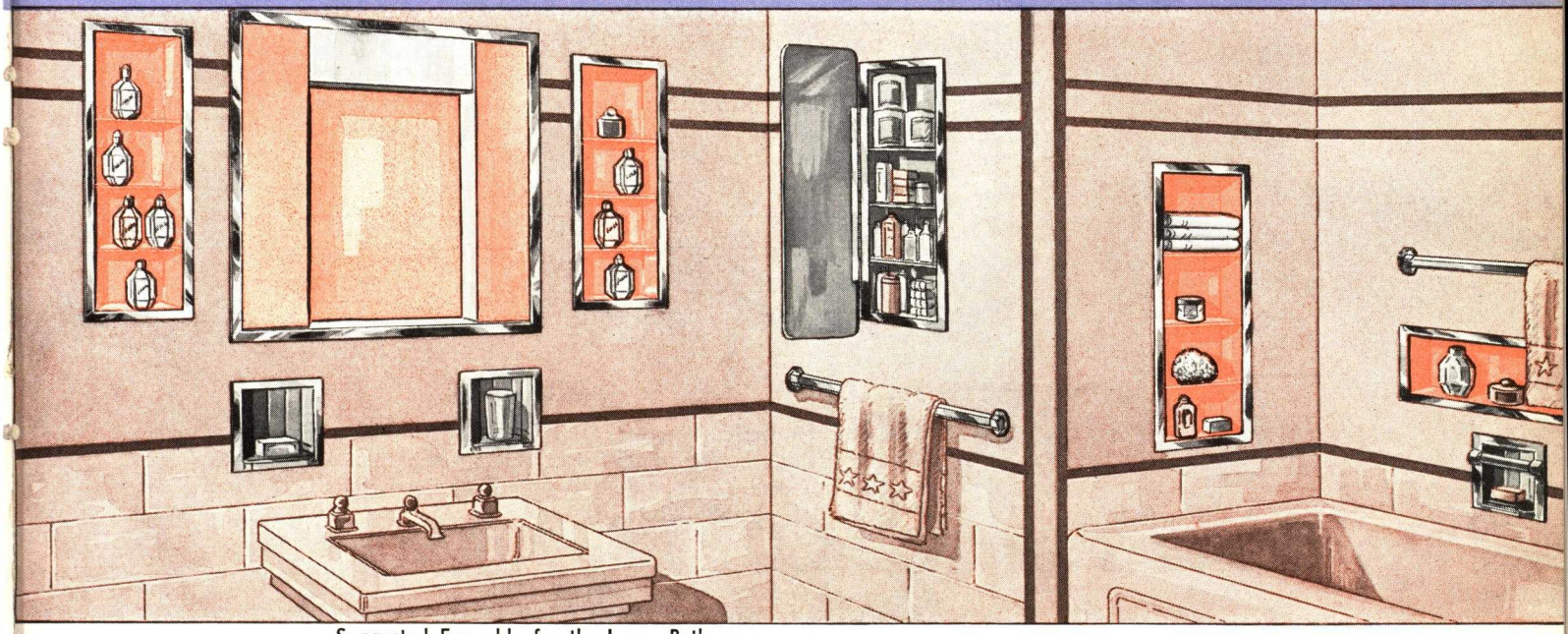
Architects and builders long have recognized the inadequacy of standard bathroom cabinets and accessories which make no provision for the numerous odds and ends the housewife likes to keep in the bathroom. To overcome this deficiency . . . to provide an orderly place for every bathroom essential . . . to add new beauty and convenience . . . *Miami Cabinet Ensembles* were created.

Miami Cabinets are produced in Combination Units, in various shapes and sizes, to conform to individual bathroom architecture and the family needs. With Miami Units, you may supply a large cabinet for husband and wife; individual cabinets for children; unit for sponge, brush, bath salts and other supplies handy for the bather; a towel storage cabinet . . . all in delightful harmony and in sizes that make efficient use of wall space and beautify the bathroom.

MIAMI BATHROOM CABINETS, MIRRORS

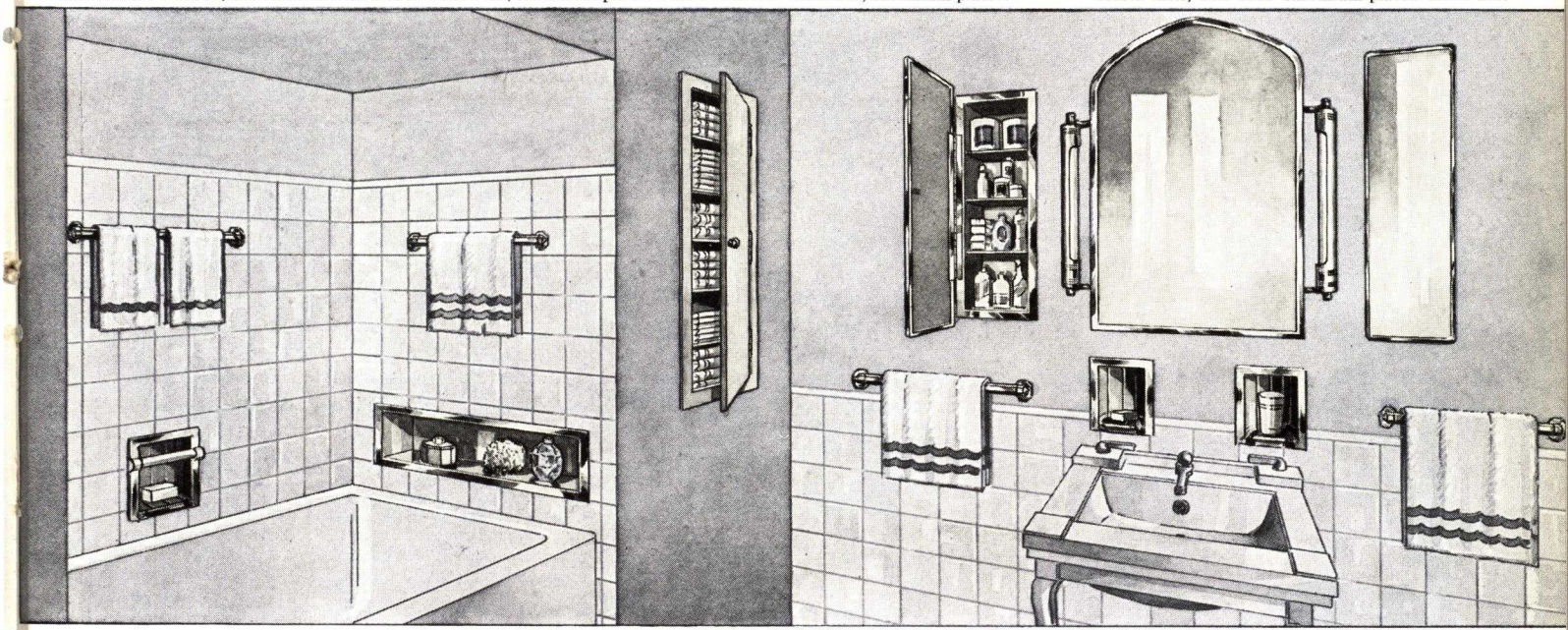
INET ENSEMBLES

OOMS··Make Them *Really Complete!*



Suggested Ensemble for the Large Bathroom

DuBarry Ensemble consisting of center unit with concealed lighting. Rose (flesh) colored mirrors. No. 900 side cabinets, lined with regular silver mirrors or color to match center cabinet. Over lavatory: No. 6000 soap holder, No. 6001 tumbler holder. No. 901, side cabinet with mirror front door, chromium plated frame. No. 5001 towel bar, chromium plated. Over end of tub—No. 900 cabinet. Over side of tub—No. 6004 soap dish and grab bar; No. 904 mirror-lined, recess shelf; No. 5003 chromium-plated towel bar.

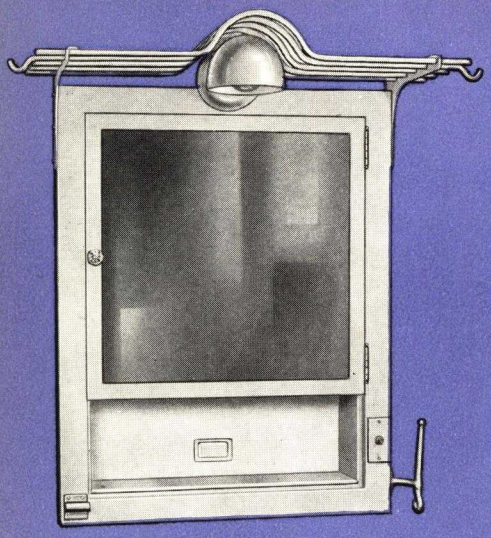


Suggested Ensemble for Children's Bathroom

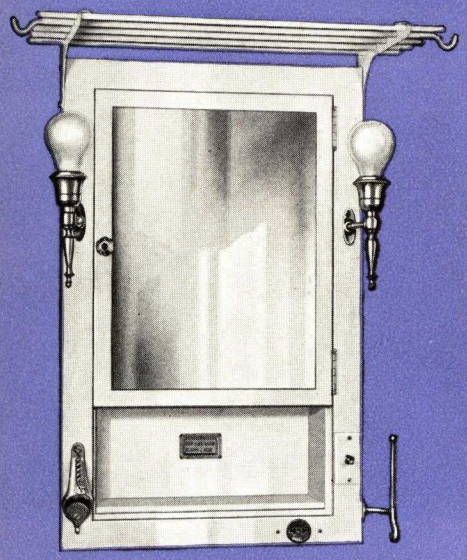
No. 6004 soap holder with grab bar; Unit No. 904 mirror-lined recess shelf; towel bars Nos. 5002 and 5003. No. 500 towel supply cabinet. Bathroom cabinet No. 2010-P, with tubular light brackets. On each side is Unit No. 901, with all-mirror (brass, chromium-plate framed) doors. Soap holder No. 6000; tumbler holder No. 6001; No. 5004 towel bars.

and ACCESSORIES . . . AMERICA'S FINEST

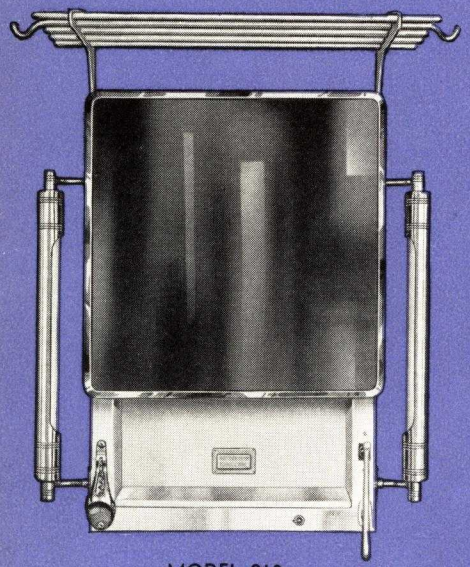
HOTEL CABINETS



MODEL AS-110 — AS-410



MODEL 905



MODEL 910

The models illustrated on this page were designed by Miami-Carey engineers in co-operation with hotel architects and engineers. Design and equipment are based on long experience and thorough knowledge of hotel requirements. Thousands of these cabinets are installed in the world's leading hotels, clubs and public buildings.

It is not necessary for hotel architects and owners to limit themselves to models illustrated on this page. The models illustrated are practical. This is an approved fact; however, if you are designing a new hotel or remodeling an old one, Miami-Carey engineers will co-operate with you in working out your own ideas.

MODELS AS-110 AND AS-410

Regular equipment for the AS-110 and the AS-410 consist of overhead curved towel tray with douche bag hooks, center light fixture complete with opal shade, white enameled combination soiled towel and razor strop hook, light switch, bottle opener, razor blade drop, three adjustable glass shelves and one *vitrolite* shelf.

SPECIFICATIONS

	Model AS-110	Model AS-410
Mirror	16″ x16″	12″ x16″
Wall opening	17½″x24½″x3⅞″	13½″x24½″x3⅞″
Overall	20¾″x26¾″	16¾″x26¾″

MODEL 905

Regular equipment consists of overhead straight towel tray complete with douche bag hooks, two bronze, *chromium plated* light brackets, light switch, white enamel combination face towel and razor strop hook, convenience plug, combination bottle opener and cork screw, razor blade drop, three adjustable glass shelves and one white *vitrolite* shelf.

SPECIFICATIONS

Mirror	12″ x16″
Wall opening	13½″x24½″x3⅞″
Overall	16¾″x26¾″

MODEL 910

Introducing a new and distinctive hotel cabinet designed for today's modern and up-to-date hotel.

The new and distinctive *chromium plated* Tubular light brackets, one on each side of the cabinet, are designed so that the light can be thrown either directly onto the mirror or out into the room. The *chromium plated* shades are so designed that they permit turning in a complete circle. These brackets are attached to the cabinet body so as to illuminate the entire mirror and at the same time provide perfect illumination for all of the bathroom.

Regular equipment consists of straight overhead towel tray with douche bag hooks, two adjustable *chromium plated* Tubular light brackets, light switch, combination face towel and razor strop hook, convenience plug for electric razor and other electrical accessories, combination *chromium plated* bottle opener and cork screw, razor blade drop, three adjustable glass shelves, one white *vitrolite* shelf.

The door frame around the mirror is *brass chromium plated.*

SPECIFICATIONS

Mirror	16″ x16″
Wall opening	13¾″x21¾″x3¾″
Overall	16¼″x23½″x4¼″

All door hinges are *brass, chromium plated.* All cabinets illustrated are finished in MIAMI *Crystal Snow,* guaranteed not to retain a stain nor to discolor with age.

MIAMI MIRRORS

For Flush Mounting on the Wall

Frameless, Chromium-Framed and Panel Types

The mirrors on this page are only a few of the large number of wall-hung mirrors we can furnish.

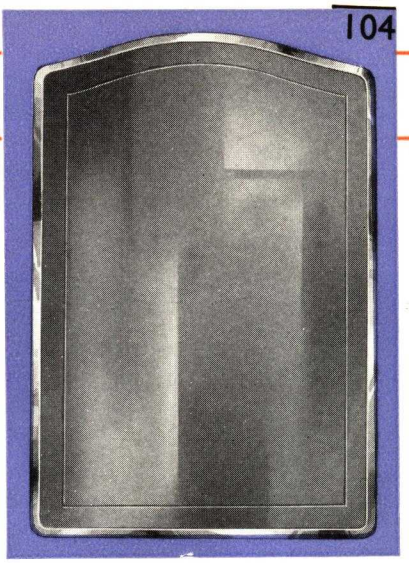
The doors of all cabinets pictured on pages 11, 14, 20, 21, 22 and 23 can be furnished as Wall Mirrors fitted with concealed keyhole slots for hanging on the wall.

The list price of all Wall Mirrors is seventy-five (75%) per cent of the list price of the complete cabinet on which the mirror is regularly used.

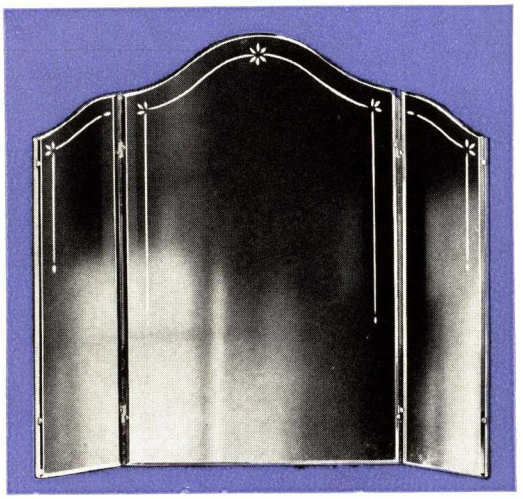
Example: List price of Model 2010-P Cabinet is $25.00. The list price of the mirror door of this model fitted with concealed hanging slots would be $18.75.

These mirrors are easily and quickly attached over invisible hangers. Recommended for the downstairs washroom, the entrance hall in the home, school, theatre, bathhouse, garage, and all other washrooms.

Mirrors are *copper backed*. The mirror frames on the "M" models are brass, chromium plated. The mirror clips on the other models are chromium plated or stainless steel. The frames of models 1N, 2N, 3N are steel, finished in white.



Chromium-Framed Model
No. M-100 — M-105 — M-107



All Glass Wing Model, No. 7-WH, 6-WH

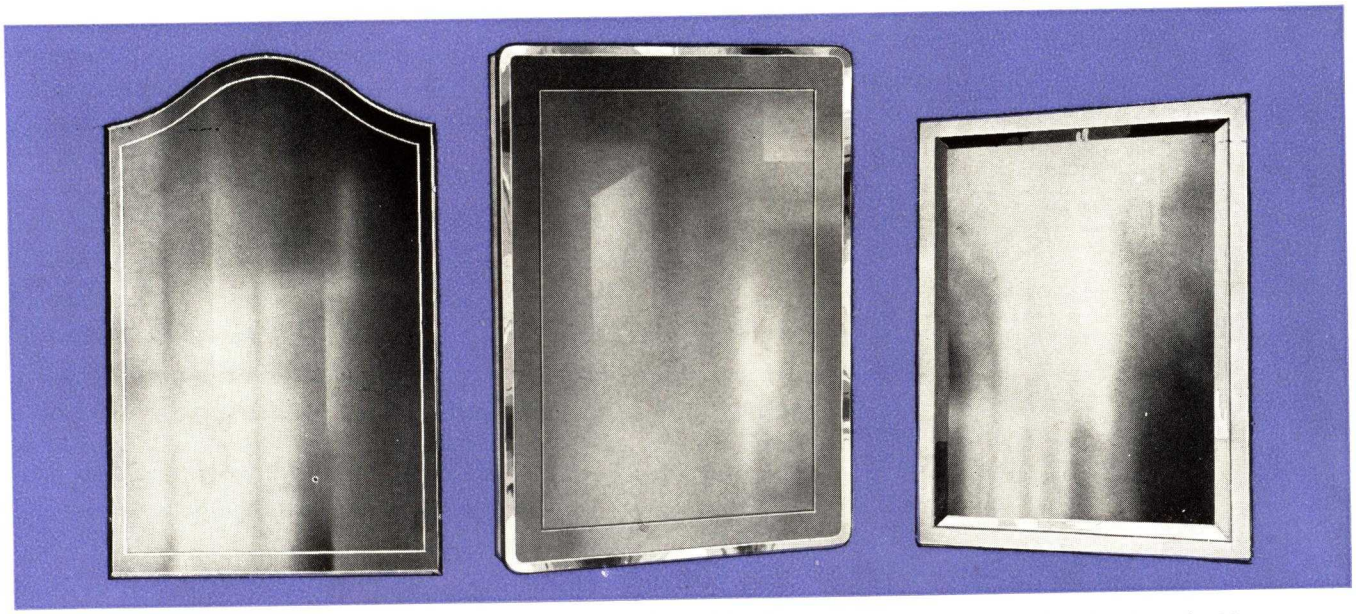
SPECIFICATIONS

Chromium-Framed Model
No. M-100 — M-105 — M-107

M-100	16″x26″
M-105	18″x28″
M-107	20″x32″

All Glass Wing Model
No. 7-WH — 6-WH

7-WH	Center Mirror	18″x28″
6-WH	" "	16″x26″



All Glass Model

SPECIFICATIONS

7-M	18″x30″
6-M	16″x26″

Chromium-Framed Model

SPECIFICATIONS

M-110	16″x22″
M-115	18″x24″
M-117	20″x28″

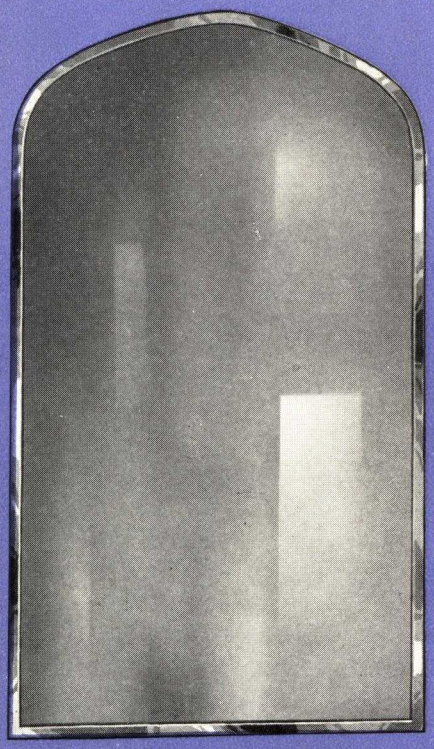
Models 1-N, 2-N, and 3-N

SPECIFICATIONS

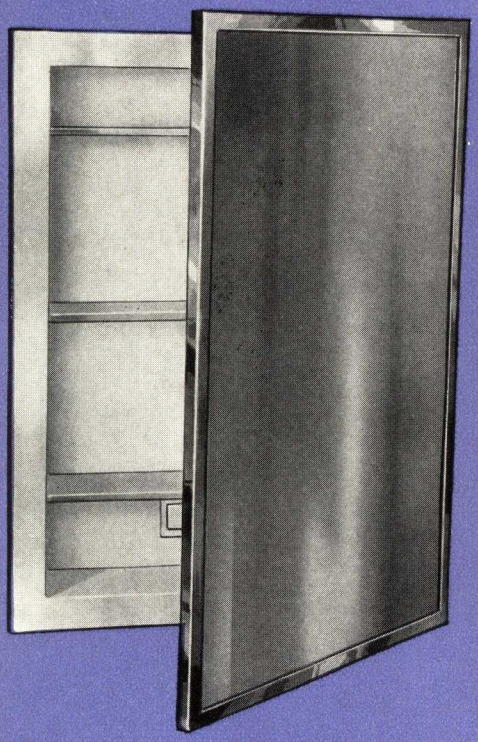
Model	*1-N*	*2-N*	*3-N*
Mirror	16″x22″	14″x18″	12″x16″
Overall	17¼″x23¼″	15¼″x19¼″	13¼″x17¼″

CABINETS WITH FULL-MIRROR DOOR

Framed in Stainless Steel



Nos. 2010-P, 2020-P



Nos. 2030-P, 2040-P, 2050-P

Gothic Top Model

The two models shown on this page are among the most popular in the whole line. They are moderately priced — yet have those features of construction that have made Miami-Carey Cabinets famous, not only throughout the United States, but throughout the world.

The *stainless steel* frames around the mirrors are absolutely non-rusting and may be kept clean and highly polished just by rubbing with a clean, dry cloth. No polish is necessary. *Stainless steel* is the perfect match for *chromium plated* bathroom fixtures; hence, the Gothic models as well as the square top models shown below are particularly recommended for bathrooms fitted with *chromium plated* fixtures where the budget does not permit the purchase of higher priced *chromium plated* models.

The Gothic top model is available in two sizes as specified below.

SPECIFICATIONS

	Overall	Mirror	Wall Opening
2010-P	16⅝"x26⅝"	16"x26"	13¾"x19¾"x3½"
2020-P	18⅝"x28⅝"	18"x28"	15¾"x21¾"x3½"

❖ ❖ ❖ ❖

Square Top Model

The square top *stainless steel* frame models illustrated on the left are recommended for the bathroom where the design is straight lined rather than arched or curved.

This model is available in three sizes as specified below.

General specifications: All models on this page are fitted with *selected* No. 1 plate glass mirror *copper backed*, guaranteed for five years against silver spoilage. Cabinet doors are the heavy air cushion type hung on heavy piano hinges. The cabinet bodies and door backs are finished in three coats of first-quality *baked enamel* applied over rust-resisting undercoat. A positive acting bullet catch of brass locks the door.

Regular equipment: Three adjustable bulb edge glass shelves, used razor blade drop, two tooth brush racks, four installing screws and washers furnished with each cabinet.

SPECIFICATIONS

	Overall	Mirror	Wall Opening
2030-P	16⅝"x22⅝"	16"x22"	13¾"x19¾"x3½"
2040-P	18⅝"x24⅝"	18"x24"	15¾"x21¾"x3½"
2050-P	20⅝"x28⅝"	20"x28"	17¾"x25¾"x3½"

CABINETS WITH FULL MIRROR DOOR

Gothic Top Model

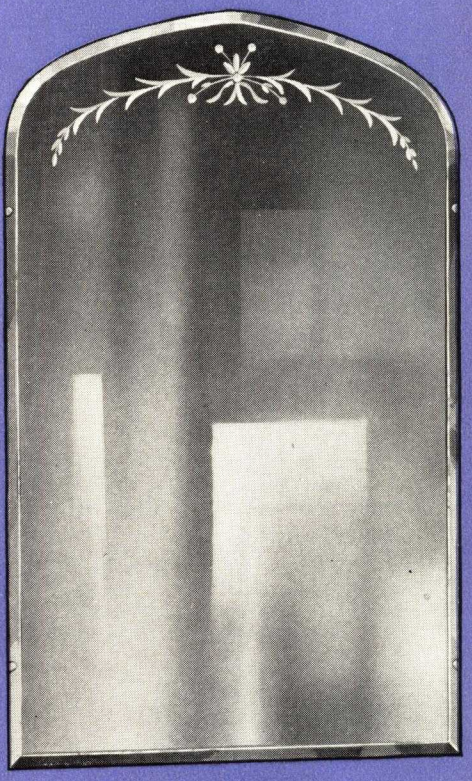
Prior to the introduction of the Carey line of cabinets, only those to whom expense was no object could afford cabinets of the type illustrated at the right. Now, because of the ingenuity of the Miami-Carey engineers, these beautiful models are available for the modest home and apartment at new all-time low prices. Quality has not been sacrificed. We are able to offer these new and different Gothic models only because of improved manufacturing methods.

The beautiful mirror hung on the steel door of the hollow metal type covers the entire cabinet so that when the cabinet is set in place, the appearance is that of a mirror hung on the face of the wall.

To those who prefer the all-glass front cabinet with no knob, hinges or ugly screw heads to mar the face of the mirror, we recommend the Gothic in either of the two sizes below.

SPECIFICATIONS

	Overall	Mirror	Wall Opening
610-G	16″x26″	16″x26″	13¾″x19¾″x3½″
620-G	18″x28″	18″x28″	15¾″x21¾″x3½″



Nos. 610-G, 620-G

Square Top Model

The square all-glass model pictured on the right is recommended for the bathroom built along simple lines where arches and curves are not used.

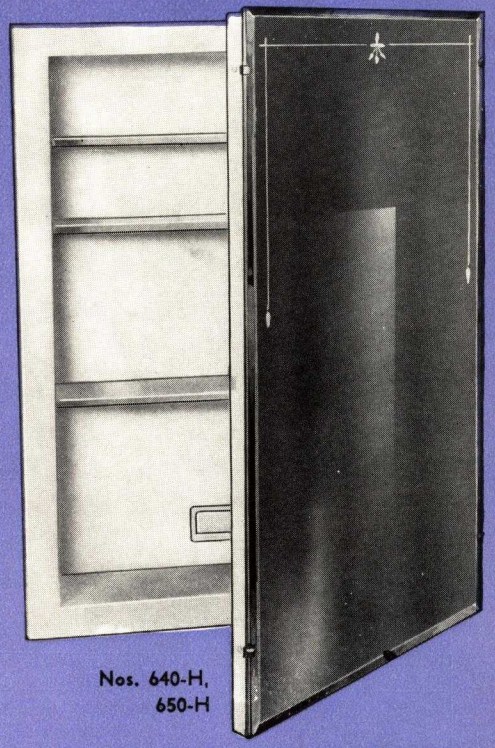
General specifications: The mirrors on all models illustrated on this page are *selected* No. 1 plate glass, *copper backed*, guaranteed for five years against silver spoilage; the mirror clips are *stainless steel;* the hinges are the piano type. Cabinet bodies and doors are 20-gauge ARMCO autobody steel, all corners reinforced.

Regular equipment: All models are equipped with three adjustable bulb edge glass shelves, the used razor blade drop, and two tooth brush racks.

The square top models are available in two sizes as specified below.

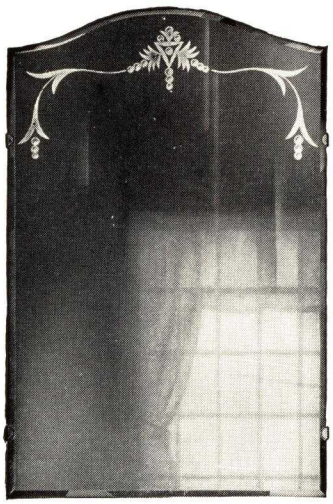
SPECIFICATIONS

	Overall	Mirror	Wall Opening
640-H	16″x22″	16″x22″	13¾″x19¾″x3½″
650-H	18″x24″	18″x24″	15¾″x21¾″x3½″



Nos. 640-H, 650-H

27
104



Model No. 660-F, 670-F

The Aristocrats

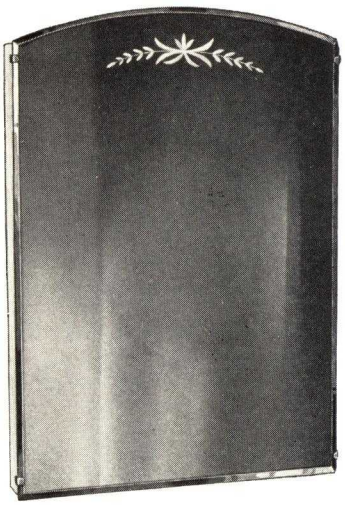
The Aristocrats are designed for the home where price must be considered but where quality is also taken into consideration.

The mirrors on Model 660-F and 670-F are No. 1 *selected* plate glass *copper backed*, guaranteed for five years against silver spoilage. The mirror clips are *stainless steel*. Note the extra large mirror (18x30-inch) on Model 670-F.

Regular equipment: Three adjustable bulb edge glass shelves, *chromium plated* razor blade drop, piano hinge, two tooth brush racks.

SPECIFICATIONS

	Mirror	Wall Opening
Model 660-F....	16″x24″	13¾″x19¾″x3½″
Model 670-F....	18″x30″	15¾″x21¾″x3½″



Model No. 701-F

MODEL 701-F

The mirror on this model is crystal plate, *copper backed*, guaranteed for five years against silver spoilage. The hinges are butt type, *nickel plated*.

Regular equipment: Two adjustable bulb edge glass shelves, razor blade drop, two tooth brush racks.

SPECIFICATIONS

Mirror	16″ x22″
Wall opening	13¾″x18¼″x3½″

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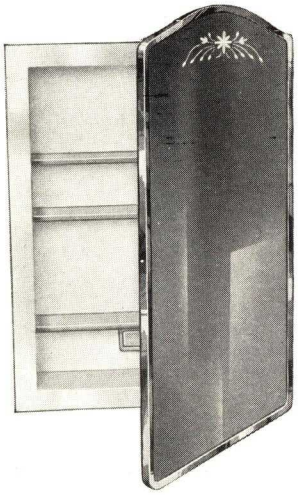


Model No. 1622-BF, 1622-CF

FRAMED VENETIAN MODELS

Presenting three models that are in keeping with the present trend toward greater use of metal in home building and home furnishing.

The mirror on Model 1622-BF is set in a rich black enamel frame that harmonizes with black and white tile bathrooms or those fitted with black fixtures.

The mirror on Model 1622-CF is set in a *brass chromium plated* frame—a budget model suggested for the inexpensive bathroom that is fitted with *chromium plated* accessories.

The mirrors on Models 1622-BF and 1622-CF are selected No. 1 plate glass, *copper backed*, guaranteed for five years against silver spoilage.

Regular equipment: Three adjustable bulb edge glass shelves, *chromium plated* razor blade drop, two tooth brush holders.

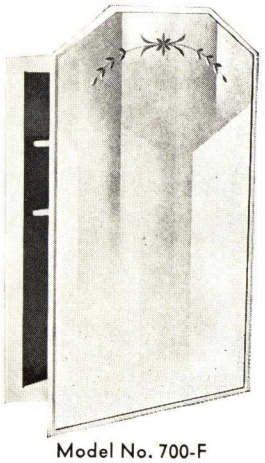
MODEL 700-F

This model is an inexpensive recessed cabinet designed for the low priced home or apartment. The mirror is crystal glass, not *copper backed*, set in a modernistic shape door of white enameled steel.

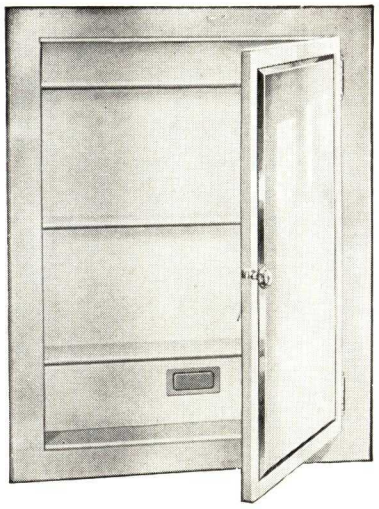
Regular equipment: Chain door stop, one tooth brush holder, razor blade drop and two white enamel steel shelves, shelves not adjustable.

SPECIFICATIONS

	Mirror	Wall Opening
Model 700-F	15⅝″x22⅞″	13⅝″x19¾″x3⅝″
Model 1622-BF	16″ x24″	13¾″x19¾″x3½″
Model 1622-CF	16″ x24″	13¾″x19¾″x3½″



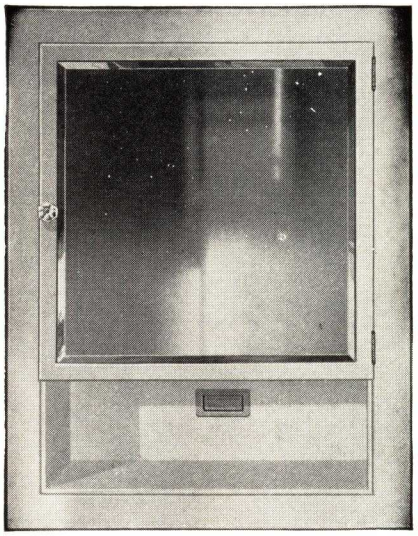
Model No. 700-F



Model 250

The cabinets shown here combine high quality with a price that represents an excellent value. These models are particularly recommended for public buildings, schools and hospitals; also for the modest bathroom. The same careful workmanship and high standard of materials that characterizes the more luxurious Miami-Carey Cabinets have been adhered to in the manufacture of these models.

These cabinets are made from heavy gauge ARMCO auto-body steel, finished in a first-quality *baked enamel* and equipped with air cushion doors that swing quietly on *nickel plated* hinges. Four *cadmium plated* installing screws are furnished. The mirrors are *copper backed* guaranteed for five years against silver spoilage.



Model 240

The patented Miami-Carey drop for used razor blades is installed in all models. This feature, that solves for all time the question of what to do with the used razor blade, has won nation-wide approval of Architects, Contractors and Home Owners.

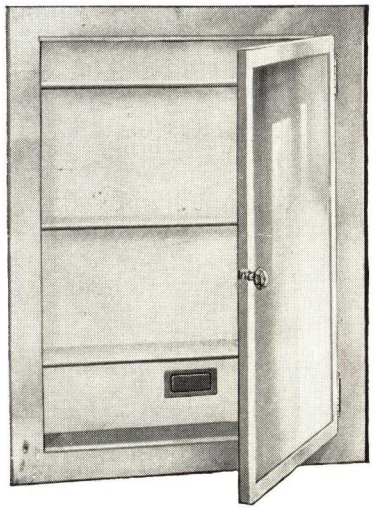
Bevel or plain mirrors may be had in any of these cabinets. When ordering, be sure to specify the type of mirror wanted. Bevelled mirrors cost slightly more than plain mirrors.

Model 250 is furnished regularly with bevel plate mirror. Plain plate mirror is available. The shelves are adjustable, heavy bulb edge glass. The hinges are *nickel plated.*

Model 240 shown above is fitted with a 16x16-inch bevel plate mirror and finished regularly in *baked enamel.* It is equipped with three, heavy bulb edge glass shelves and razor blade drop. The open shelf below the door provides a convenient repository for toilet or shaving articles.

SPECIFICATIONS

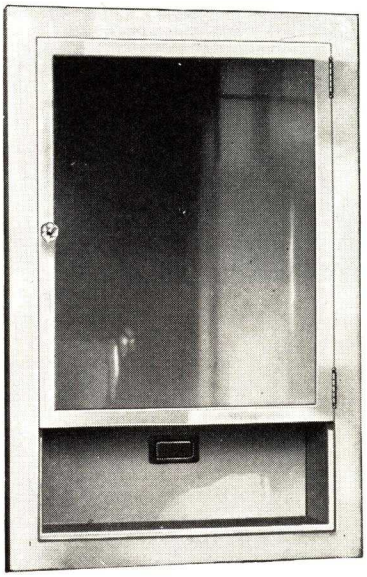
MODEL	250	240	220	230	200	210
Mirror	16″ x22″	16″ x16″	14″ x18″	14″ x18″	12″ x16″	12″ x16″
Inside	17″ x23″	17″ x23″	15″ x19″	15″ x25″	13″ x17″	13″ x23″
Overall	20¾″x26¾″	20¾″x26¾″	18¾″x22¾″	18¾″x28¾″	16¾″x20¾″	16¾″x26¾″
Wall Opening	17½″x23½″	17½″x23½″	15½″x19½″	15½″x25½″	13½″x17½″	13½″x23½″



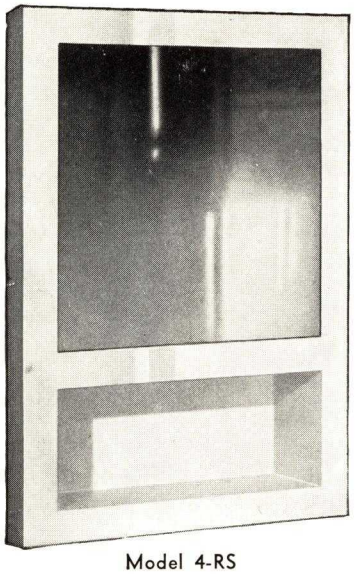
Model 200 and 220

Models 220, 200, 230 and 210 are especially recommended for the modest bathroom where price is to be considered. These cabinets are very practical in design, rugged in construction and of a uniformly high quality.

Regular specifications include: Baked Enamel finish, plain plate mirrors, razor blade drop and tooth brush racks. Bevelled mirrors may be substituted at a slightly higher price.



Model 210 and 230

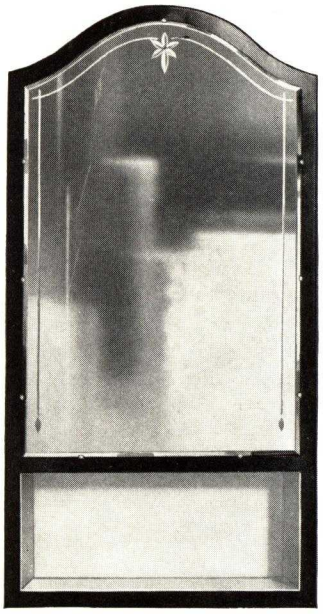


Model 4-RS

The cabinet models shown on this page are designed to hang flush on the wall and are recommended for use on thin walls or in old construction where it is not desirable to cut an opening. They are also very practical for towel supply cabinets in commercial buildings.

These numbers are all of characteristic Carey-Miami quality construction with bodies made of ARMCO auto-body steel, finished in first quality baked white enamel and furnished with glass shelves, held in U brackets. They are durable in construction, neat in appearance and represent outstanding values among low-priced cabinets.

In addition to being used in modest homes, many thousands of them are used in hotels, clubs, schools and institutions throughout the world.

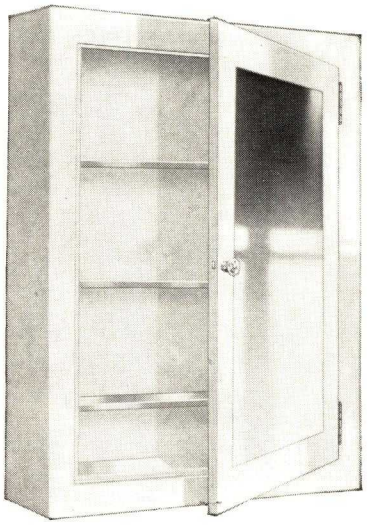


Model RSK

SPECIFICATIONS

The recessed shelf below mirror provides convenient place for water glass, toilet articles, etc. Body, ARMCO auto-body steel; plain mirror; finish, snow-white baked enamel; first quality crystal mirror.

Overall	18¾"x26⅜"
Mirror	16" x16"
Wall Opening	16" x 6½"
Recess Shelf	15½"x 6"

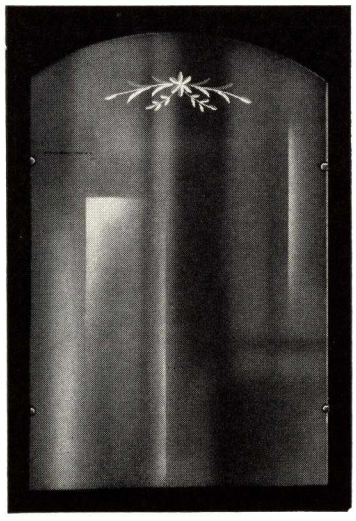


Models No. 800 and 816

SPECIFICATIONS

This model combines the beauty of a Venetian mirror with the utility of a recessed mirror. Capacious pocket below mirror for toilet articles, hand towels, etc. Body, ARMCO auto-body steel; finish, baked enamel, bevelled plate mirror.

Overall	15¾"x31½"
Mirror	14" x22"
Wall Opening	14½"x7½"x3¾"
Recess Shelf	14" x7"x4"



Models No. 1 and No. 3

SPECIFICATIONS

Crystal, plate thickness Venetian mirror with curved top and bevelled edge. Two bulb-edge glass shelves adjustable to three positions; cadmium-plated installing screws; chromium-plated mirror clips; baked enamel finish.

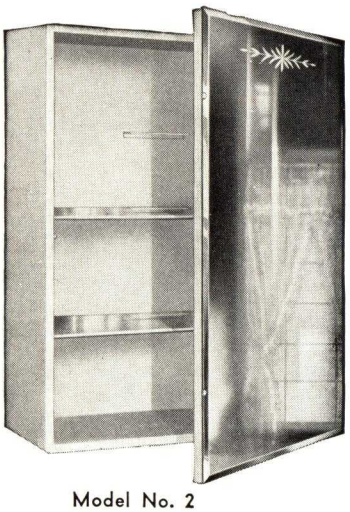
Model	Mirror Size	Body Size
No. 1	12"x18"	11½"x15¾"
No. 3	14"x20"	13½"x17¾"

SPECIFICATIONS

Three glass shelves, set in U-brackets. Plain mirror in door. Two nickel plated hinges. Pull knob with bullet catch.

	Model 800	Model 816
Mirror	14" x18"	12" x16"
Overall	18¾"x22¾"	16¾"x20¾"
Inside	15" x19"	13"x17"

Where price is an important consideration, Carey Cabinets are the first choice because of their outstanding quality. Their popularity is attested by world-wide use.



Model No. 2

SPECIFICATIONS

Crystal, plate thickness Venetian mirror with square top and bevelled edge. Two glass shelves adjustable to three positions; cadmium-plated installing screws; chromium-plated mirror clips; baked enamel finish.

Model	Mirror Size	Body Size
No. 2	12"x16"	11½"x15¾"

MIAMI

CHROMIUM BATHROOM ACCESSORIES

Brilliantly Beautiful

This line of MIAMI Chromium Lifetime Bathroom Accessories was developed to meet the needs of those who wanted a product that was thoroughly modern . . . that could be sold at popular prices . . . that could be inexpensively installed in practically any bathroom.

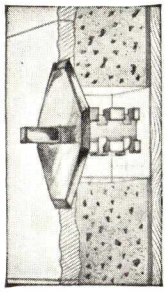
Miami Chromium Bathroom Accessories are built to resist long wear and hard use. Over a forged, brass base, a thick coating of nickel is applied and then a covering of hard chromium. This method of manufacture assures a product that will give utmost satisfaction and retain its original brilliance.

The recessed accessories are provided with larger and wider flanges which eliminate open joints, fit perfectly and give a more finished appearance. The projecting accessories are tightly secured with a new type of key plug.

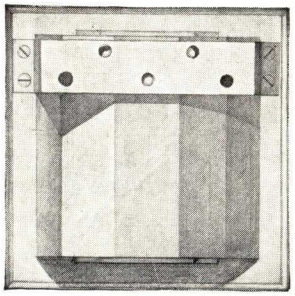
When ordering accessories be sure and specify the type of bracket required by adding the prefix "L" to the model number for the lug type, or the prefix "S" to the model number for screw-on type.

INSTALLATION DETAILS OF MIAMI ACCESSORIES

L TYPE

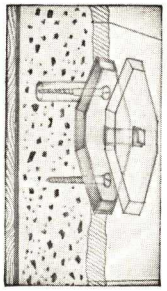


This detail shows the method of installing fixture permanently into wall with cement. Available in all projecting styles shown in this catalog. If wanted, add prefix "L" to fixture model number.



All recessed fixtures which carry prefix "L" are so designed to "key" permanently into the wall with cement or mortar. The Soap and Grab Bar No. 6004 has the additional reinforcing bar shown above for additional strength. Recessed fixtures are also made in "S" type for attaching to recess cut in wall, with screws or toggle bolts.

S TYPE



This detail shows method of installing fixtures to the surface of the wall with screws or toggle bolts. Available in all projecting styles shown in this catalog. If wanted, add prefix "S" to fixture model number.

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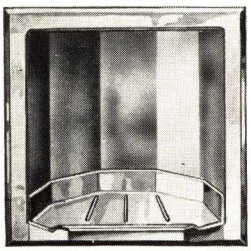
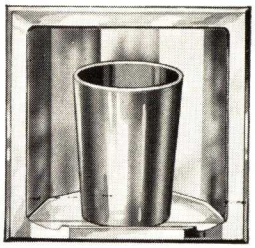
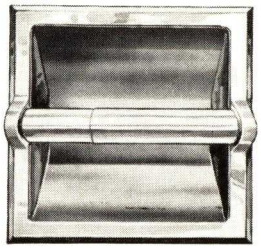
RECESSED ACCESSORIES



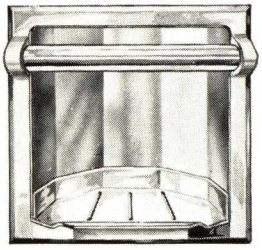
No. 6000
Soap Holder
with Glass Tray



No. 6001
Tumbler Holder



PAPER HOLDER
No. 6002 — Chrome Roller
No. 6003 — Wood Roller



No. 6004
Soap and Grab Bar
with Glass Tray

Accessories number 6000, 6001, 6002, 6003, 6004 are recessed models. They can be appropriately built into any style wall by making arrangements in advance for their installation. When installed, they become a part of the wall itself.

TIME SAVER ACCESSORIES

FIT STANDARD TILE OPENING . . . 4¼" x 4¼" Opening — 5½" x 5½" Overall

Time Saver Accessories are practical and beautiful—exactly the same in appearance as the Miami Recessed Accessories illustrated above. The only difference is that they are smaller; yet they are equal in inside area to the average 6" x 6" china accessory.

Time Saver Accessories can be installed in tile walls without mitering or cutting the tile. They fit into a 4¼" x 4¼" tile opening.

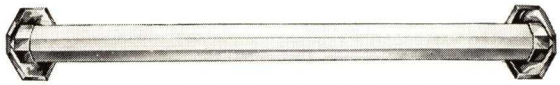
No. 6005
Recessed 4¼" Soap Holder

No. 6006
Recessed 4¼" Tumbler Holder

No. 6007
Recessed 4¼" Soap and Grab

(Use No. 6002 or No. 6003 Recessed Paper Holder with above accessories.)

TOWEL BARS



OCTAGON CHROMIUM PLATED BARS—CHROME BRACKETS
No. 5000—⅞"x 8" Octagon Grab Bar
No. 5001—⅞"x18" Octagon Towel Bar
No. 5002—⅞"x24" Octagon Towel Bar
No. 5003—⅞"x30" Octagon Towel Bar
No. 5004—⅞"x36" Octagon Towel Bar

SQUARE CRYSTAL GLASS TOWEL BARS—CHROME BRACKETS
No. 5018—⅞"x18" Square Glass Bar
No. 5019—⅞"x24" Square Glass Bar
No. 5020—⅞"x30" Square Glass Bar
No. 5021—⅞"x36" Square Glass Bar

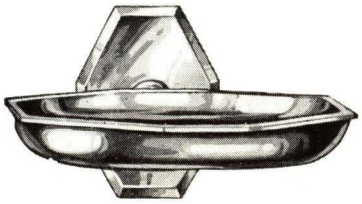
ROUND CRYSTAL GLASS TOWEL BARS—CHROME BRACKETS
No. 5032—⅞"x18" Round Glass Bar
No. 5033—⅞"x24" Round Glass Bar
No. 5034—⅞"x30" Round Glass Bar

SQUARE CHROMIUM-PLATED BARS—CHROME BRACKETS
No. 5022—⅞"x8" Square Grab Bar
No. 5023—⅞"x18" Square Towel Bar
No. 5024—⅞"x24" Square Towel Bar
No. 5025—⅞"x30" Square Towel Bar
No. 5026—⅞"x36" Square Towel Bar

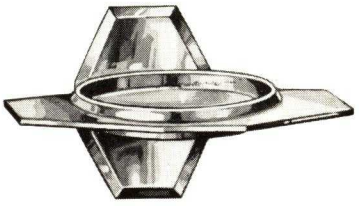
ROUND CHROMIUM-PLATED BARS—CHROME BRACKETS
No. 5027—⅞"x8" Round Grab Bar
No. 5028—⅞"x18" Round Towel Bar
No. 5029—⅞"x24" Round Towel Bar
No. 5030—⅞"x30" Round Towel Bar
No. 5031—⅞"x36" Round Towel Bar

PROJECTION TYPE ACCESSORIES

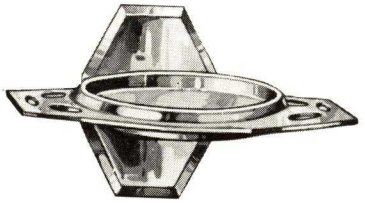
All accessories illustrated on this page and Towel Bars, page 26, are furnished with the "L" lug type brackets for installing the fixture permanently into the wall, or with the "S" screw-on type brackets that fasten readily to practically any surface. The screws are concealed by the front plate of the bracket.



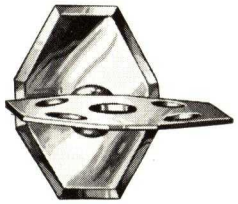
No. 5005—Soap Dish
No. 5006—Soap Dish with Drain Holes



No. 5007
Tumbler Holder

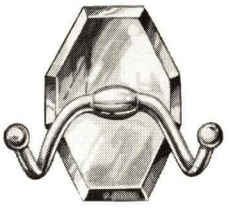


No. 5008
Tumbler and Tooth-Brush Holder

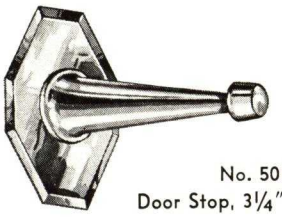


No. 5009
Tooth-Brush Holder

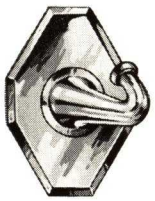
No. 5010
Single Robe Hook



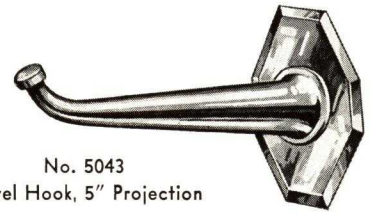
No. 5011
Double Robe Hook



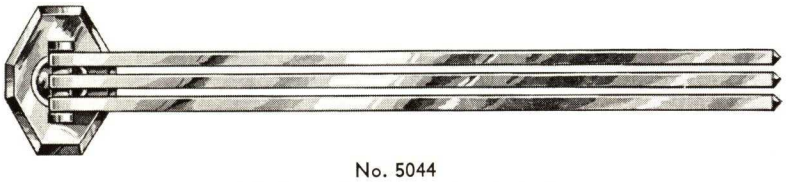
No. 5014
Door Stop, 3¼" Projection



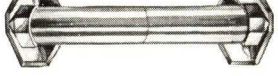
No. 5042
Razor Strop Hook



No. 5043
Towel Hook, 5" Projection



No. 5044
3-Arm Swing Towel Rack, 12" Arms



No. 5012—Paper Holder with Chromium Roller
No. 5013—Paper Holder with Wood Roller

No. 5017—8⅜"x25" Chromium Towel Shelf

CRYSTAL GLASS SHELVES

No. 5014—⅜"x5"x18" Glass Shelf—Chrome Brackets
No. 5015—⅜"x5"x24" Glass Shelf—Chrome Brackets
No. 5016—⅜"x5"x30" Glass Shelf—Chrome Brackets
No. 5035—5/16"x5"x18" Glass Shelf—Chrome Brackets
No. 5036—5/16"x5"x24" Glass Shelf—Chrome Brackets
No. 5037—5/16"x5"x30" Glass Shelf—Chrome Brackets

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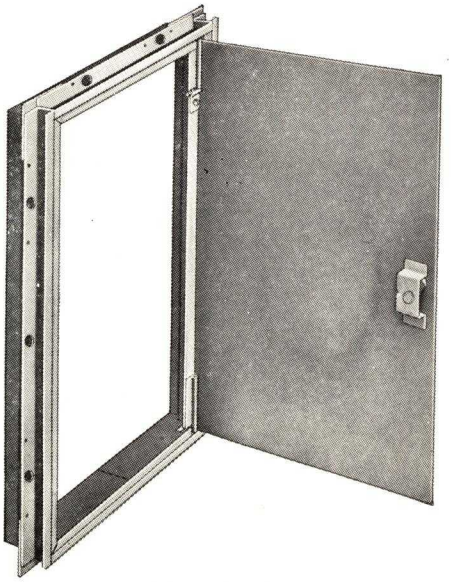
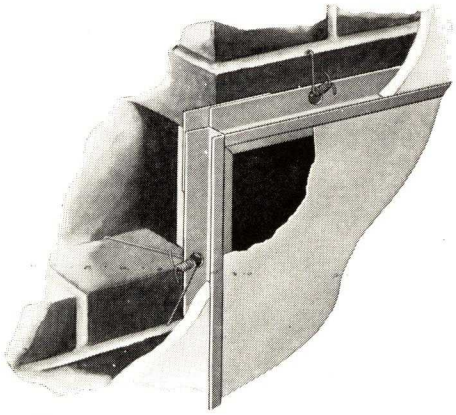
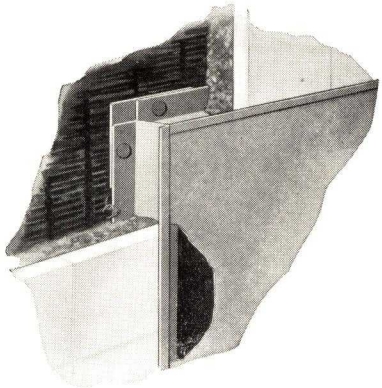


The above illustration shows access door open, exposing "back out" type cam lock; fixed and operative pivot; frame with plaster key flange "A" and reinforced corners.



The illustration above shows Carey Access door with "A" type flange in masonry wall with plastered face.



Where walls are faced with marble or tile or similar material plaster key flange is set back from face of door 1½" to allow for ample bed of mortar. This type flange is known as "B".

Hinged Door Type

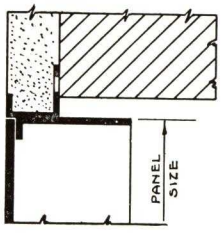
Carey Hinged Access Doors permit quick, easy access to pipes, plumbing valves, air shafts, electric wiring, etc. They come as a unit, ready to place in wall or ceiling without special framework or bucks. Frames are of sixteen (16) U. S. gauge galvanized steel, reinforced at corners and with perforated key or fastening flanges for plastered surfaces. Frames may also be had for walls faced with marble or tile or for masonry walls requiring face flange only. Lids are of fourteen (14) gauge leveled steel and are equipped with fixed and operative pivot as well as cam lock which automatically backs lid from frame when exposed, flush screw head bolt in door is turned.

Carey Access Doors fit flush with wall surface and may be papered or decorated over. They receive a shop coat of enamel baked on before leaving factory.

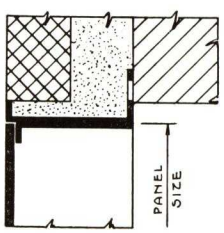
SPECIFICATIONS

Model	Panel Size	Wall Opening	Weight
711	7½"x11½"	8"x12"	6 lbs.
1216	12½"x16½"	13"x17"	10 lbs.
1418	14½"x18½"	15"x19"	14 lbs.
1824	18½"x24½"	19"x25"	25 lbs.
1830	18½"x30½"	19"x31"	30 lbs.

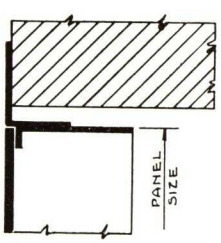
Carey Access Doors with "A" type flange for plastered walls are carried in stock ready for immediate shipment. Access Doors for marble and tile faced walls and plain flanged type ("C") are carried knocked down and require a few days for assembly. When ordering be sure to designate type flange (A, B or C) wanted. When not specifically mentioned "A" type will be furnished.



Type "A" plaster key flange for all types of walls faced with plaster.



Type "B" key flange set back from face of panel for tile or marble faced walls.



Type "C" has one inch face flange; only for glazed brick or unfinished masonry walls.

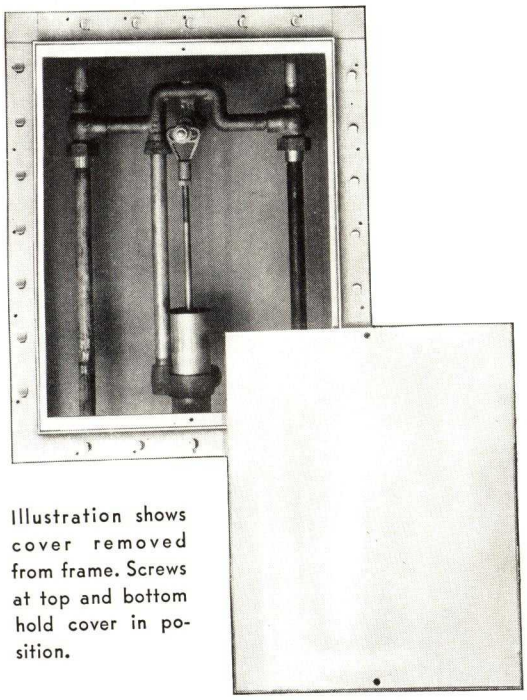


Illustration shows cover removed from frame. Screws at top and bottom hold cover in position.

CAREY ACCESS DOORS

Screw Door Type

Access doors permit quick, easy access to pipes, plumbing valves, air shafts, electric wiring, etc. The frames are heavy gauge ARMCO autobody steel. All corners are reinforced. Frames are fitted with plaster hooks. They may also be nailed or screwed to wood studs.

The door is 14-gauge ARMCO autobody steel. Door fits snugly against inside sill of the frame. The edges of the frame and door are flush with plaster. Doors can be covered with wallpaper or painted so as to be almost invisible. A screw driver is the only tool needed to open the door. The removable door can then be put aside out of the way of men working.

When ordering state whether doors are to be set in plaster-faced walls or in walls faced with marble or tile. Flange depths are set back for tile or marble walls.

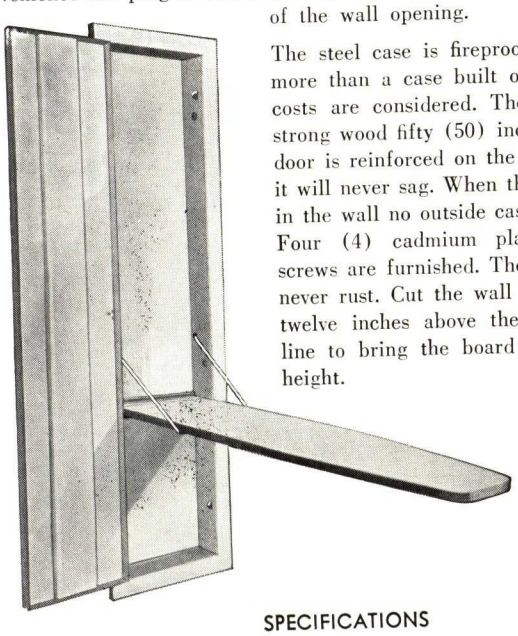
SPECIFICATIONS

Model	Panel Size	Wall Opening	Weight
812	7½ x 11½″	8 x 12″	6 lbs.
1317	12½ x 16½″	13 x 17″	12 lbs.
1519	14½ x 18½″	15 x 19″	16 lbs.
1925	18½ x 24½″	19 x 25″	27 lbs.
1931	18½ x 30½″	19 x 31″	33 lbs.

CAREY BUILT-IN IRONING BOARDS

The Carey Ironing Board Cabinet is a real step saver in the kitchen or laundry. It is made to fit between standard studding and when not in use it may be folded back, out of the way.

The cabinet is regularly finished in prime coat so that it can be painted to match the room trim. It may also be had in *Crystal Snow* finish if desired. At a small extra charge the cabinet may be fitted with a convenience hot plug and a sleeve board. If the convenience hot plug is desired, bring the house wires into top center of the wall opening.



The steel case is fireproof. It costs no more than a case built of wood, if all costs are considered. The board is of strong wood fifty (50) inches long. The door is reinforced on the inside so that it will never sag. When the board is set in the wall no outside casing is needed. Four (4) cadmium plated installing screws are furnished. These screws will never rust. Cut the wall opening about twelve inches above the finished floor line to bring the board to the proper height.

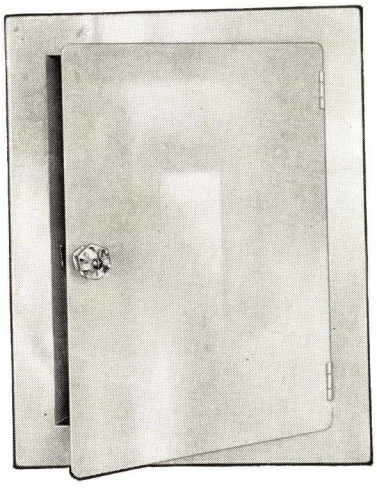
SPECIFICATIONS

Overall	16¾ x 59¾″
Wall opening	14¼ x 57¾ x 4½″
Board	11½ x 50″

CAREY LAUNDRY CHUTE

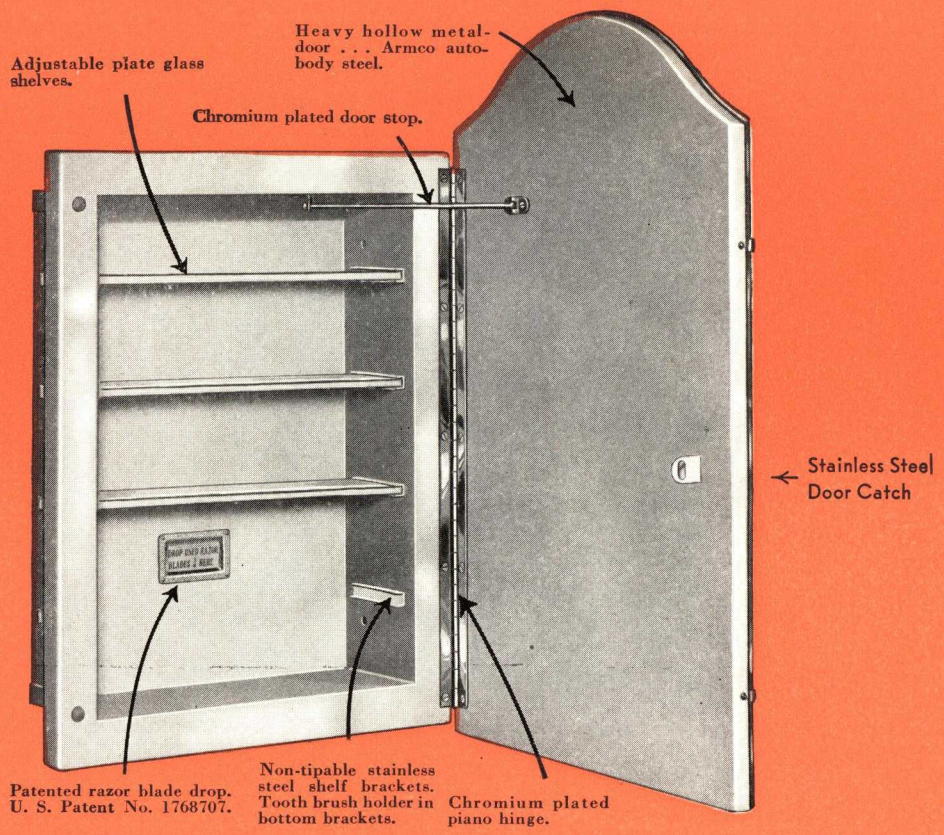
The Carey Laundry Chute door, designed to replace the old-fashioned bulky and unsightly wood door, is indeed a worth while addition to any home. It will never warp or get out of square. Painted to match the color scheme of the home, it is a welcome successor to the unsightly, old-fashioned wood door.

The Carey Laundry Chute Door is manufactured of heavy gauge ARMCO autobody steel, finished in prime coat. The unit arrives at the job all ready to install, no hardware to buy, no doors to fit. Four *cadmium plated* installing screws are furnished. These screws will never rust. The four corners of the body are reinforced with steel angles so that the unit will never sag. The door is held with a brass bullet catch. This complete unit costs less than the old style wood door. It can be installed in five to ten minutes' time.



SPECIFICATIONS

Overall	11¼ x 14¼ x 1½″
Wall opening	9 x 12″
Door size	8⅞ x 12″



MIAMI CABINET CONSTRUCTION FEATURES

Copper-Backed Mirrors Used on All Miami Cabinets. Crystal Snow Finish, Piano Hinges Regular on All Models. All Hinges Are Chromium Plated

All Miami Cabinets on pages 7, 11 and 14 are one-piece construction. No seams or open joints.

DESIGN

The modern bathroom demands beauty, and the first requisite for a cabinet is a graceful design that will add a distinctive touch to the picture. But the cabinet is one of the most used pieces of equipment in the bathroom and must be rugged in construction also; it is subjected to frequent abuse and has to be so designed that it will last a lifetime in spite of the most adverse conditions. Eminent architects have submitted their conceptions of attractive designs, and their requirements for beauty have been interpreted by capable engineers in terms of practical construction—combining in Miami Cabinets the maximum of beauty and utility.

CONSTRUCTION

Long life is built into every Miami Cabinet. The bodies and flanges, carefully formed from heavy gauge auto-body steel, are electrically welded and heavily reinforced to provide maximum strength.

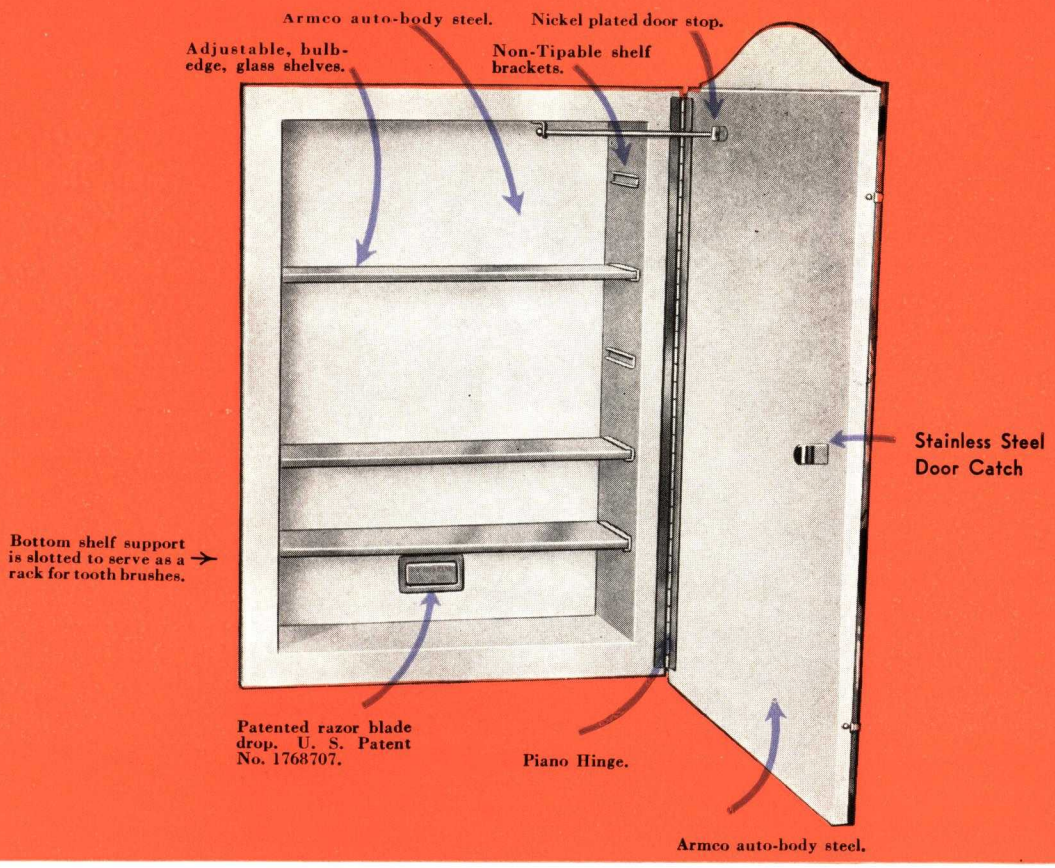
The doors on all models are air-cushioned to absorb shocks, and in the flush door types the mirrors are set in a heavy waterproof packing which prevents deterioration.

Copper-backed Venetian mirrors are "suspended" on special clips rather than fastened rigidly to the door panel. This provides a cushion that absorbs shocks. Small felt pads provide an insulating air pocket behind the mirror that protects it against the steam in the bathroom.

Refinements in the construction include adjustable plate glass shelves, U-shaped brackets that prevent the shelves from tipping, and solid brass chromium-plated piano hinges.

FINISH

A cabinet is no better than its finish. The best materials, the finest workmanship, the best principles of construction cannot prevent or even delay that shabby appearance that is so commonly found in steel bathroom cabinets because the finish couldn't stand the severe atmospheric conditions. With this in mind THE MIAMI CABINET COMPANY developed Crystal Snow which is of pyroxylin nature applied by a special process. It is guaranteed not to discolor with age, nor to crack, craze or peel. The original luster will remain indefinitely in spite of frequent cleaning to remove iodine, acid stains or match burns—a fact which earned for Crystal Snow the title: *"The Finish That Won't Retain a Stain."*



CAREY BATHROOM CABINETS

Quality Line at Moderate Prices

The Carey Line of bathroom cabinets was introduced to the trade four years ago in response to insistent demands for a line of moderate priced cabinets manufactured in accordance with Miami standards. By improving our methods and because of the tremendous volume sold, we have been able to manufacture these cabinets to meet the rigid requirements of Miami quality and yet sell them at competitive prices. Next to a Miami Cabinet, the best you can buy is a Carey Cabinet.

In presenting Carey Cabinets, Access Doors, Laundry Chute Doors and built-in Ironing Boards, we employ the same careful workmanship and attention to detail and quality of materials that you have learned to expect in Miami products.

Construction features in all Carey Cabinets except Models No. 1, 2, 3, 700-F and 701-F are: No. 1 quality mirrors, *copper backed*, guaranteed for five years against silver spoilage.

The mirror furnished on Model 701-F is crystal plate, *copper backed*, guaranteed for five years against silver spoilage.

The mirrors on No. 1, 2, 3 and 700-F are crystal plate, not *copper backed.*

The hinges on all Carey models except No. 1, 2, 3, 700-F, 701-F and the models on page 23 are piano type *brass nickel plated.*

Butt type *nickel plated* hinge is furnished on Model 701-F and on Models on catalog page 23. Steel white enamel hinges are furnished on Models 1, 2, 3, and 700-F. All Carey Cabinets are finished in three coats of first quality *baked enamel* applied over rust-resisting undercoat.

Shelf brackets are finished to match the interior of the cabinet. The two bottom shelf brackets on all models except No. 1, 2, 3 and 700-F are so designed that tooth brushes can be hung on them if so desired. Cabinet No. 700-F is fitted with one individual tooth brush rack to accommodate three brushes. Models 1, 2 and 3 do not have the tooth brush rack.

Carey Cabinets are constructed of 20-gauge ARMCO steel. The return flange on all Carey recessed models is one inch.

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MIAMI-CAREY DISTRIBUTORS

We regret that limited space prevents us from listing all Miami-Carey Distributors.

ALABAMA
Birmingham, The Philip Carey Company, 1601-4 Empire Bldg.
Birmingham Sash & Door Company, 9th Ave. & 28th St.

ARKANSAS
Fort Smith, Dyke Brothers

CALIFORNIA
Los Angeles, The Philip Carey Company, 4536 District Blvd.

CANADA
Walkerville, Ontario, Ladore & Company, Ltd., Walker Power Bldg.

COLORADO
Denver, C. V. Oglevie, 949 Garfield

DISTRICT OF COLUMBIA
Washington, Floyd Koontz, 1427 Eye St., N.W.

FLORIDA
Jacksonville, The Philip Carey Company, 607 E. Forsyth St.
Miami, Miami Metal Weatherstrip Company, 1136 N.E. 2nd Ave.

GEORGIA
Atlanta, The Philip Carey Company, 666 Greenwood Ave., N.E.

ILLINOIS
Chicago, Illinois Philip Carey Company, 2100 Fullerton Ave.
Peoria, Builders Specialty Company, 325 South Washington St.

INDIANA
Indianapolis, Pierson-Lewis Hardware Company, 119 E. Vermont St.
The Philip Carey Company, 1111 E. 19th St.

KANSAS
Wichita, United Sash & Door Company

KENTUCKY
Louisville, The Philip Carey Company, 1032 South 8th St.

MARYLAND
Baltimore, The Philip Carey Company, 1400 Moreland Ave.

MASSACHUSETTS
Boston, Brockway-Smith-Haigh-Lovell Company, 465 Medford St.

MICHIGAN
Detroit, Ray T. Lyons, 2457 Woodward Ave.
Kalamazoo, Equipment Service Company, 1506 American National Bank Bldg.

MINNESOTA
Minneapolis, The Philip Carey Company, 943 Lumber Exchange Bldg.
St. Paul, Raymer Hardware Company, 58 E. 5th St.

MISSOURI
Kansas City, Kelley Asbestos Products Co., 2010 McGee St.
The Philip Carey Company, 2008-2010 McGee St.
Fred B. Kennedy, 1200 Oak St.
St. Louis, Felker & Felker, 3550 Pine Grove Ave.
The Philip Carey Company, 4485 Duncan Ave.

MONTANA
Butte, Archie W. Adams, 618 Metals Bank Bldg.

NEW YORK
Albany, Wholesale Service Supply Company, 46 Spencer St.
Binghamton, A. Roberson & Son
Buffalo, The Philip Carey Company, 1174 Niagara St.
Dohn-Fisher & Co., Inc., 1330-1348 Niagara St.

NEW YORK—*Continued*
New York City, The Philip Carey Co., 60 E. 42d St.
Niagara Falls, Haeberle Lumber Company, 1004 Cedar St.
Rochester, S. A. Spencer, 135 Spring St.
Syracuse, Alexander Grant's Sons, 134 Genesee St.
Utica, American Hard Wall Plaster Company

NORTH CAROLINA
Charlotte, A. L. Simpson, 1316 Romany Road
The Philip Carey Company, 131 Brevard Court

OHIO
Akron, Hardware & Supply Company, 475 High St.
Canton, Canton Hardware Company, 1221 Third St.
Cincinnati, The Philip Carey Company, 8th & Broadway
H. H. Fikret, 127 E. 9th St.
Cleveland, Porter Building Equipment Company, 6501 Euclid Ave.
Columbus, The Philip Carey Company, 232 North Water St.
Mansfield, The Overhead Door Sales Company, 195 E. 4th St.
Steubenville, Service Sales Company, 319 Washington St.
Toledo, Swan Creek Lumber Company, 226 City Park Ave.
Youngstown, Kitchen Cabinet Sales Company, 33 Broadway at Wick Ave.

OKLAHOMA
Tulsa, L. A. King, P. O. Box 375

OREGON
Portland, McCraken-Ripley Company, 2221 N. Albina

PENNSYLVANIA
Erie, Perry Lumber & Supply Company
Harrisburg, C. H. Hershock, 1513 N. Cameron St.
Philadelphia, F. H. Hammett, 401 N. Broad St.
The Philip Carey Company, 24th & Sedgley Sts.
Pittsburgh, L. A. Rust, 142 Gulf Building
The Philip Carey Company, Corliss Station
Wilkes-Barre, William H. Pierce, 402 Bennett Bldg.

TENNESSEE
Chattanooga, The Philip Carey Company, 212 Volunteer State Life Bldg.
Knoxville, A. G. Heins Company, 116-136 Heins St.
Memphis, The Philip Carey Company, 272 Walnut St.
Nashville, Keith-Simmons Hardware Company

TEXAS
Dallas, The Philip Carey Company, 417 Magnolia Bldg.
El Paso, C. C. Gaines Company, 1002 Mills Building
Austin, The Walter Tips Company, 2nd & Colorado St.

VIRGINIA
Richmond, John S. Archer, 205 E. Canal St.
Roanoke, Huttig Sash & Door Company, 1213 Maryland Ave., S.W.
Norfolk, The Philip Carey Company, 23rd & Granby Sts.

WASHINGTON
Seattle, The Philip Carey Company, 820 Fairview Place
Spokane, Jensen-Byrd Company, 314 Riverside Ave.

WEST VIRGINIA
Charleston, Fireproof Products Company, P. O. Box 1327
Wheeling, The Philip Carey Company, Chapline at 18th St.

WISCONSIN
Madison, Steel Sales Service Company, 713 Gay Bldg.
Milwaukee, Broan Equipment Company, 123 E. Pittsburgh Ave.

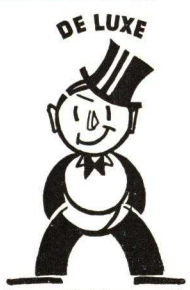
Warehouse stocks are carried in New York City; Philadelphia and Pittsburgh, Pa.; Boston, Mass.; Baltimore, Md.; Washington, D. C.; Birmingham, Ala.; St. Louis, Mo.; Milwaukee, Wisc.; Miami, Fla.; Cincinnati, Cleveland, Columbus and Dayton, Ohio; Indianapolis, Indiana.

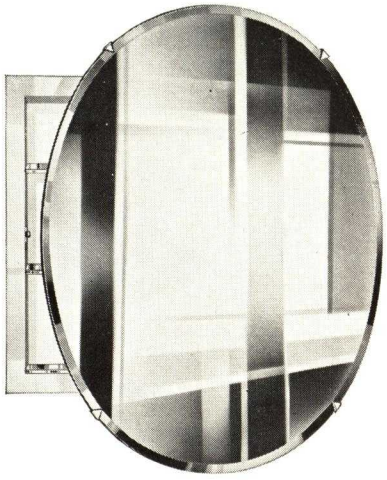
MIAMI CABINET DIVISION
The PHILIP CAREY COMPANY
Middletown, Ohio.

MORTON MANUFACTURING CO.

Manufacturers of Steel Products for the Building Industry
5105-5143 West Lake Street, CHICAGO, ILL.

MORTON DE LUXE STEEL CABINETS

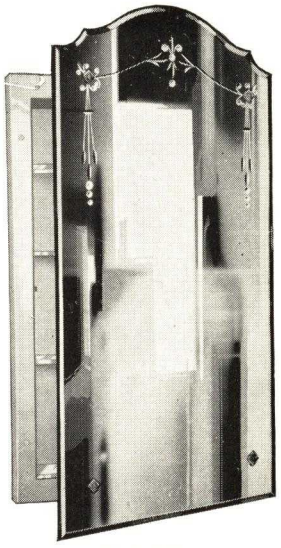




Model R

Morton De Luxe Cabinets represent the finest type of cabinet construction. Modern in design—simple and dignified, they enhance the finest bathroom in which they may appear. Out-standing among De Luxe features are the cushioned door which prevents mirror breakage, and the strong, sturdy steel construction through which all parts are welded into one complete unit. Morton De Luxe Cabinets all carry a special "Mortelite" baked enamel finish. Mirrors are of the finest quality of plate glass with copper-processed backs. A five-year guarantee gives absolute protection to the user.

Hinges are of the piano type and are chromium plated. The bulb-edged glass shelves are removable. The bottom of the cabinet is also covered with a glass shelf. A convenient removable razor blade box (patent applied for) and aluminum tooth brush holder are furnished with each De Luxe Cabinet.

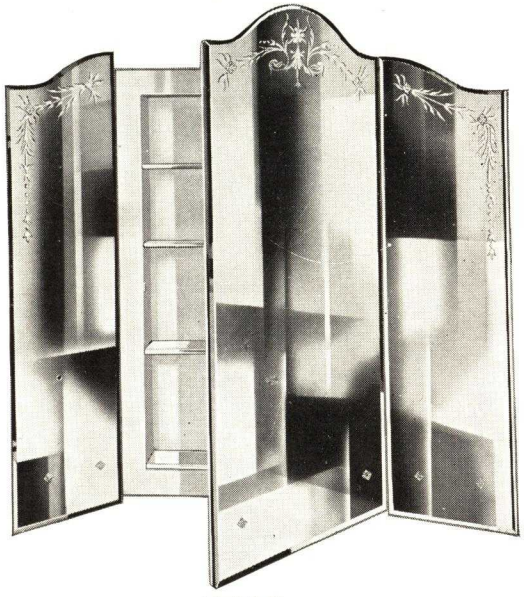


Model F

Model R—Justifies the modern trend toward the use of a circular mirror completely covering the cabinet. The mirror swings on a specially constructed hinge which allows the door to be opened to a 90° angle.

Model K—Rich in design; graceful of line. The artistically etched mirrors, the movable wings, the concealment of the cabinet, the full 3-way vision, all combine to bring about an exceedingly pleasing effect.

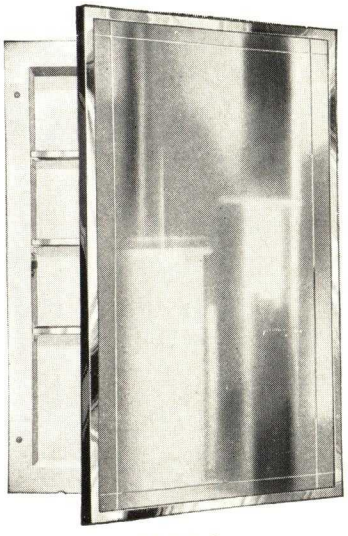
Model F—With Venetian mirrored door, comes in four sizes. Mirror completely covers the cabinet and may be obtained in several special designs.



Model K

Model C—Strikingly plain but obtains richness of design by its pure simplicity. It has a large mirror with one-piece chromium plated steel frame.

Model L—Precisely the same as Model C, but has the exclusively designed tubular lights, composed of opalescent glass tubes which are closed at the top to prevent accumulation of dust or dirt on the light bulb or interior of the tubes; mountings of brass with chromium finish. The necessary wiring, junction box, switch and convenience outlet are included, but not the T-8 bulb either 40 or 60-watt.

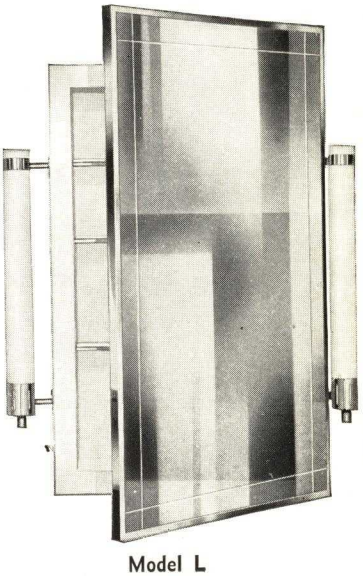


Model C

DIMENSIONS AND WEIGHTS, MORTON DE LUXE STEEL CABINETS

Model	Mirror size	Outside dimensions	Wall opening	Number of shelves
R-26	26" diameter plate	18"x18"	16½"x16½"	2
C-31	20"x31" plate	19⅛"x29⅞"	17½"x28½"	3
L-20	20"x31" plate	19⅛"x29⅞"	17½"x28½"	3
F-26	18"x26" plate	17⅛"x21¾"	15½"x20½"	3
F-32	18"x32" plate	17⅛"x27⅞"	15½"x26½"	3
F-28	20"x28" plate	19⅛"x23¼"	17½"x21½"	3
F-34	20"x34" plate	19⅛"x29⅞"	17½"x28½"	3
K-32	18"x32" plate center 8"x29½" wings	17⅛"x27⅞"	15½"x26½"	3

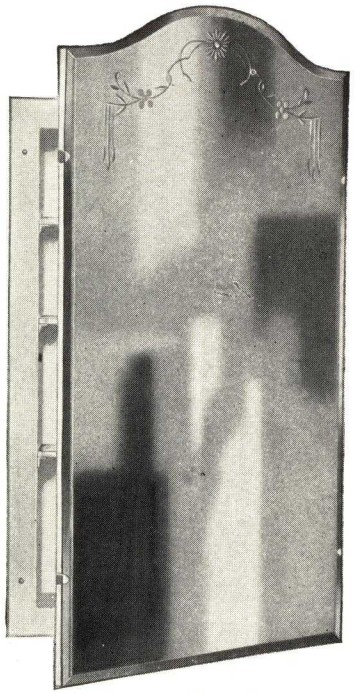
Model R-26—Over-all depth, 5 in., return flange 1 in., making a 4-in. recess depth.
Model C-31—Over-all depth 4½ in., return flange ½ in., making a 4-in. recess depth.
Model L-20—Over-all depth 5 in., return flange 1 in., making a 4-in. recess depth.
F Models—Over-all depth 4½ in., return flange ½ in., making a 4-in. recess depth.
Model K-32—Over-all depth 4½ in., return flange ½ in., making a 4-in. recess depth.



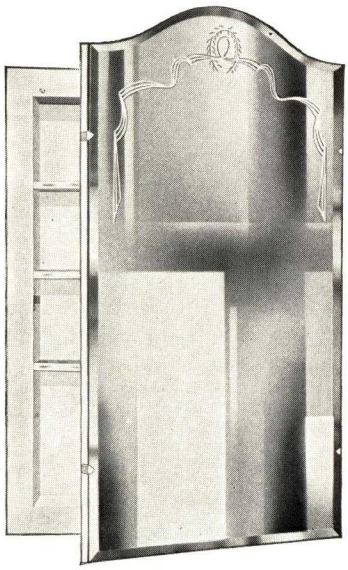
Model L

MORTON MANUFACTURING CO.

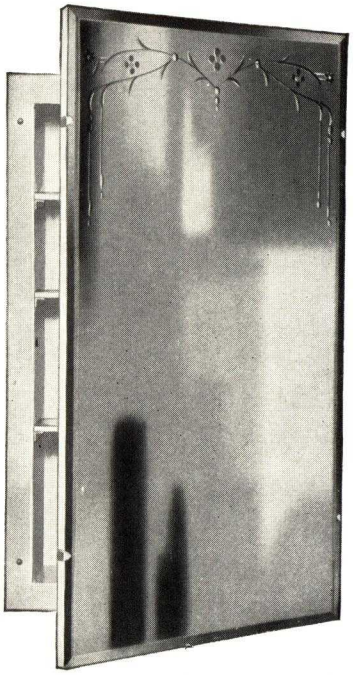
MORTON STANDARD STEEL CABINETS



Model 186-192



Model 164

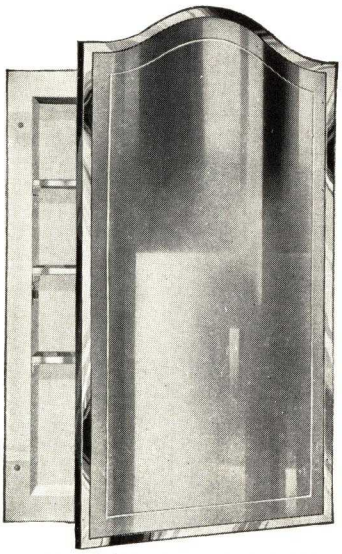


Model 162-184-190

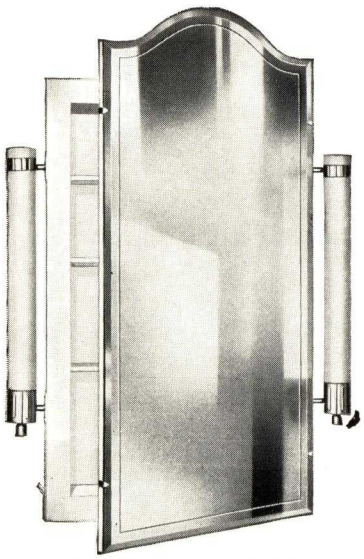
Strikingly beautiful and artistically designed, Morton Standard Cabinets add grace and beauty to the bathroom. The highest standards of construction and the best materials are used throughout.

Like the De Luxe Cabinets, they are electrically welded into one permanent unit. Standard Cabinets carry a specially designed cushioned door and "Mortelite" baked enamel finish. Mirrors of highest quality plate glass and copper-processed backs. A five-year guarantee protects the user. The mirrors are held in place by a removable ratchet type stainless steel clip (patent applied for). They are equipped with bulb-edged plate glass shelves, concealed piano hinge and door stop, and with each goes the removable razor box (patent applied for), and aluminum tooth brush holder.

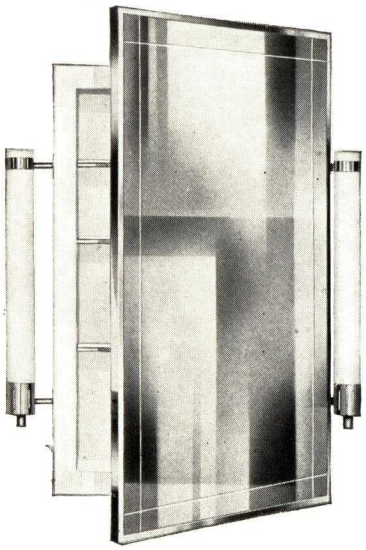
Those models having tubular light fixtures are equipped with tubular light mountings made of brass with chromium finish. These hold the opalescent glass tubes which are closed at top and bottom to prevent dust accumulation on the light bulb or interior of the tubes. Wiring, switch, convenience outlet and junction box, are also included.



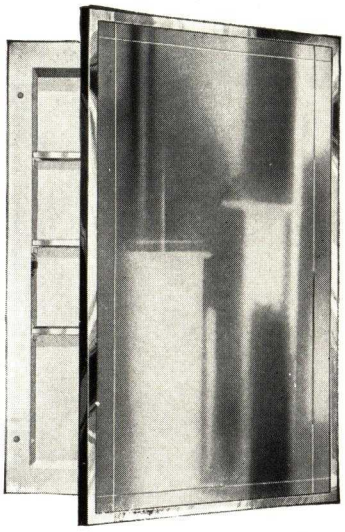
Model SM Nos. 164-186-192



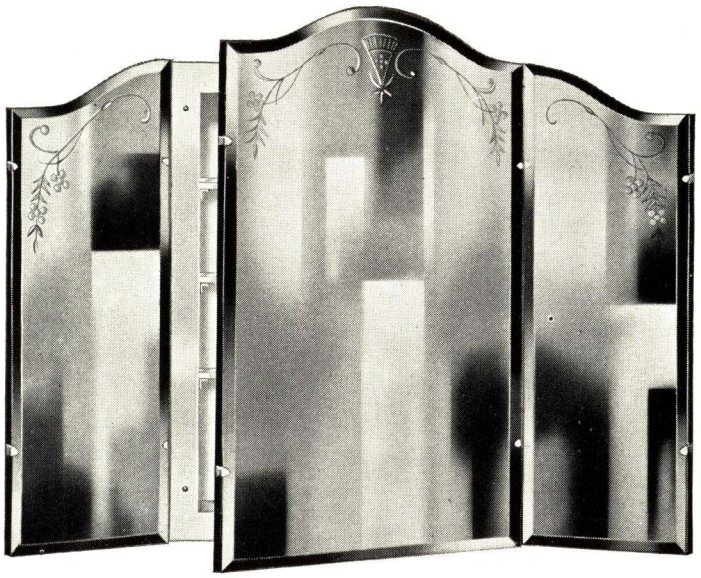
Model LM Nos. 164-192



Model LSM Nos. 162-190



Model SM, Nos. 162-184-190



Model 216

DIMENSIONS AND WEIGHTS, MORTON STANDARD CABINETS

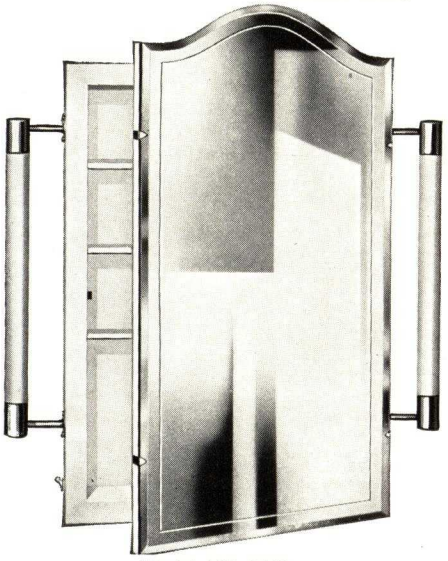
Model	Mirror size	Outside dimensions	Wall opening	Number of shelves	Shipping wt., lbs.
162	16″x22″ plate	15⅛″x21½″	13½″x20¼″	3	40
164	16″x24″ plate	15⅛″x21½″	13½″x20¼″	3	40
184	18″x24″ plate	17⅛″x21¾″	15½″x20½″	3	45
186	18″x26″ plate	17⅛″x21¾″	15½″x20½″	3	45
190	18″x30″ plate	17⅛″x27⅞″	15½″x26½″	3	50
192	18″x32″ plate	17⅛″x27⅞″	15½″x26½″	3	50
216	16″x24″ center 8″x22″ wings plate	15⅛″x21½″	13½″x20¼″	3	50

All models—Over-all depth 4½ in., return flange 1 in., making a 3½-in. recess depth. "L" refers to tubular light fixtures; "S" refers to stainless steel frame; "M" refers to mitre line mirror; Numbers refer to size and dimensions of cabinets.

MORTON ECONOMY CABINETS

For the builder who requires a sturdily built, but more economical cabinet, the Morton Economy Cabinets fit both pur-

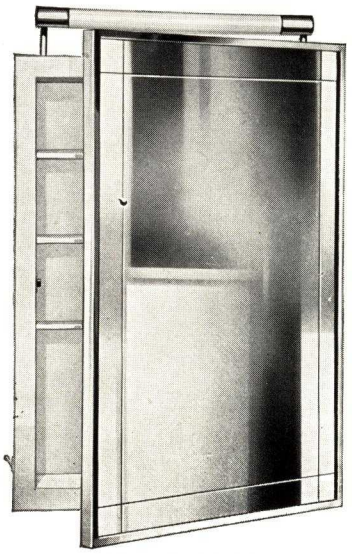
(*Continued below*)



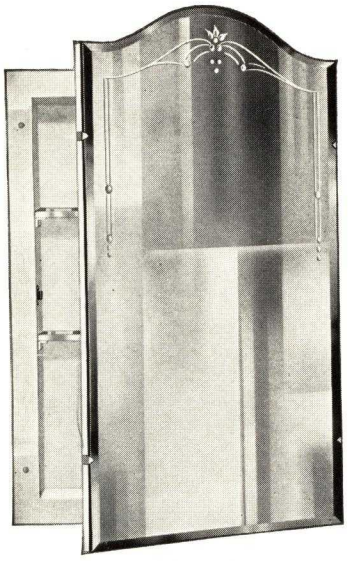
Model LM 1640

pose and purse. The Economy Cabinets are made from high grade furniture steel, but slightly lighter in weight than Morton Standard Cabinets. They are electrically spot-welded into one complete unit, and finished in "'Mortelite" baked enamel. Cabinet has a specially designed back to prevent mirror breakage. Mirror is held to the back by removable stainless steel clips of the new ratchet design (patent applied for). All mirrors are ¼-in. crystal glass with copper-processed backs. All Morton Economy Cabinets carry bulb-edged glass shelves, drop for used razor blades, and concealed hardware.

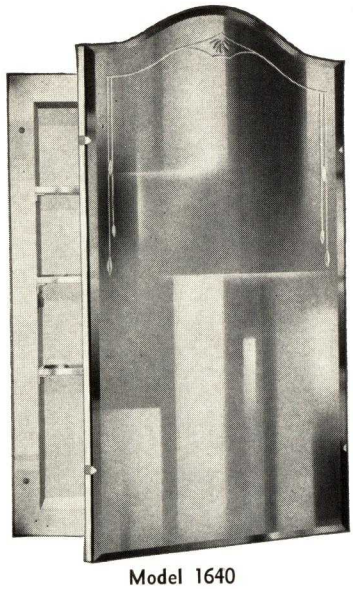
Economy Cabinets are also equipped with the Lumaline fixture, which includes the chromium plated brass mountings, wiring, bulbs, switch, and convenience outlet. See Models LM1640 and LSM1620.



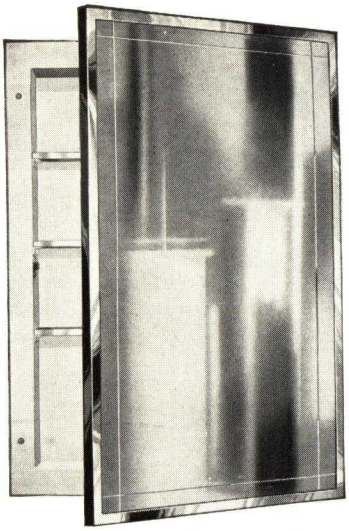
Model LSM 1620



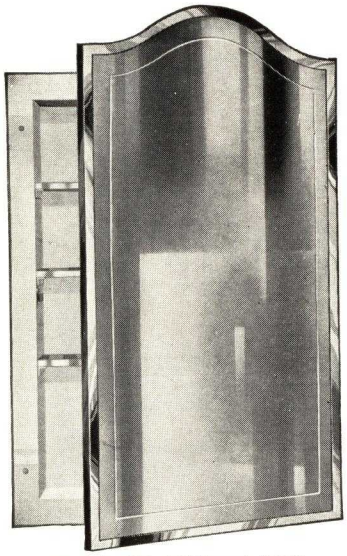
Model 1860



Model 1640



Models SM 1620 and 1840

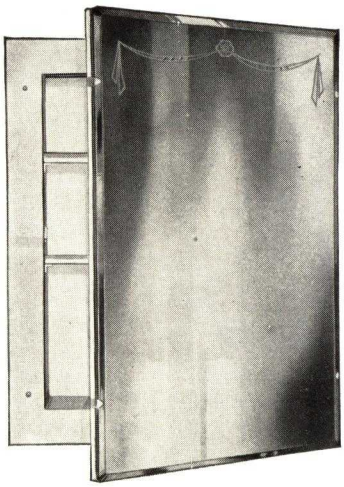


Models SM 1640 and 1860

DIMENSIONS, MORTON ECONOMY CABINETS

Model	Mirror size	Wall opening
1620	16″x22″ crystal	13½″x20¼″
1640	16″x24″ crystal	13½″x20¼″
1840	18″x24″ crystal	15½″x20½″
1860	18″x26″ crystal	15½″x20½″

All models—Over-all depth 4½ in., return flange 1 in., making a 3½ in. recess depth. L refers to Lumaline light fixtures; S refers to stainless steel frame; M refers to mitre line mirror; Numbers refer to size and dimensions of cabinets.



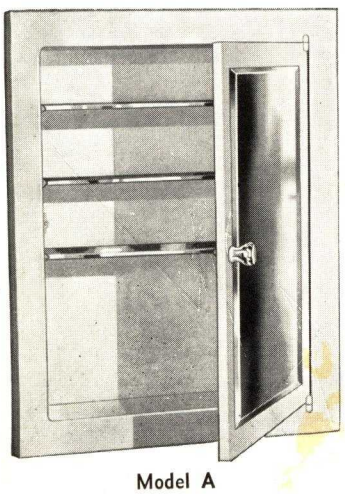
Models 1620 and 1840

MORTON SERVICE CABINETS

Low priced, yet very attractive, and admirably suited for the small home, remodeling job, apartment, hospital, hotel, or wherever a serviceable cabinet is required.

These cabinets, like all other Morton models, are made of high grade furniture steel, electrically welded into one permanent unit, and finished in special "Mortelite" baked enamel.

Mirrors are of a high quality plate glass, having copper-processed backs; bulb edged plate glass shelves; die cast rustproof hinges.

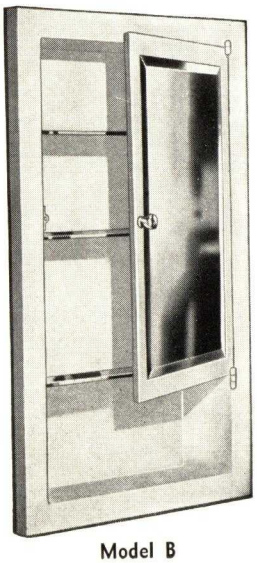


Model A

DIMENSIONS AND WEIGHTS, ETC.

Model	Mirror size	Wall opening
A	12″x16″ plate	15″x19″
A	14″x18″ plate	17″x21″
A	16″x20″ plate	19″x23″
B	10″x14″ plate	13″x23½″
B	12″x16″ plate	15″x25½″
B	14″x18″ plate	17″x27½″
B	16″x20″ plate	19″x29½″

All models can be obtained with plain mirrors. Over-all depth, 5 in., return flange 1 in., making a 4-in. recess depth.



Model B

NATIONAL

"Cabinets with Character"

NATIONAL METAL PRODUCTS COMPANY

MANUFACTURERS

WATERLOO ★ IOWA

National Metal Products Company

PIONEER MANUFACTURERS AND MASTERCRAFTERS OF METAL

Cabinets with Character

CALL 860

WATERLOO, IOWA

710 LINDEN AVENUE

NATIONAL METAL PRODUCTS COMPANY — NATIONAL — WATERLOO IOWA

CABINET DIVISION

November 10th,

To the Employees of the
National Metal Products Company:

I want to outline briefly the policy of our company.

Our first consideration shall be our customer. Serve every purchaser promptly and with the utmost care. Give small orders the same careful attention as large orders.

Our executives will continue to provide an adequate supply of best quality materials, such as prime-sheets of cold rolled furniture steel; plate or crystal glass mirrors of the finest quality; the highest grade of baking enamel and the shipping containers strong and durable so as to preserve the character of our product.

I expect each one of you to do your part in order to produce the finest and best metal cabinets that can be bought. Every workman is instructed to perform his duty honestly with conscientious effort to build character into every unit of our products.

Our sales organization must continue to represent honestly, and push the sale of our products through recognized legitimate dealer and jobber channels, extending to them, our full co-operation and support.

Our products are to be manufactured and sold under an unconditional guarantee of satisfaction. All errors must be promptly and cheerfully corrected.

I thank you for your faithful service in the past, and expect your continued co-operation.

Yours very truly,

C E Ruth
President
NATIONAL METAL PRODUCTS COMPANY.

CEB:GFH

This Letter

SENT EVERY EMPLOYEE NOVEMBER TENTH SHOWS THE *National Way*

OF BUILDING CABINETS

To Standard Specifications

HERE at National, we consider strong, time-defying construction as important as smart, modern design. Consequently, National Cabinets hold their shape . . . retain their finish . . . look trim and neat . . . even after years of severe service. They are built up to the highest standard . . . not down to a low price.

SPECIAL ITEMS: We furnish wall mirrors and cabinets of all practical sizes and description on special orders.

SPECIAL FINISH: We will finish any cabinet in special colors to match sample for a small extra charge.

SPECIAL QUANTITY PRICES: We will quote special net prices on orders for 20 or more cabinets of one style. Write for prices.

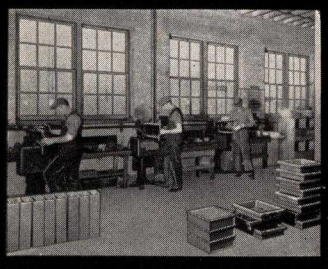
You are invited to visit our new daylight plant (covering about three acres of factory space) . . . and see why we are specialists and leaders in cabinet making . . . why National Cabinets hold their character and never need replacing. Four important departments.

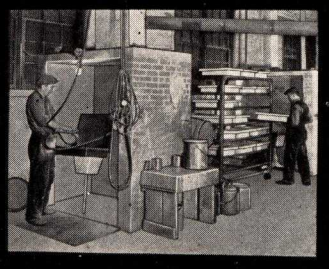
METAL FORMING
Where the cabinet is "born." Forms are accurately cut and carefully shaped from prime steel sheets . . . then electrically welded into *one-piece* solid steel cabinets. No rough edges, no bolts, nuts or screws.

SPRAY BOOTHS
Finest quality baking enamel . . . each coat sprayed on by experts. Heavy, even coverage on the edges, corners and flat surfaces. Baked "Sno-white" lifetime finish. No brush marks, no runs . . . no errors!

BAKING OVENS
Nine large brick baking ovens . . . to bake the fresh sprayed enamel for hours under the correct heat. This special baking process prevents cracking, peeling, scaling, yellowing . . . makes original lustre permanent.

INSPECTION
Double inspection eliminates flaws of workmanship, and defects of every kind. Rigid inspection, of every detail. Consequently, every Cabinet shipped is perfect . . . typifies National's *"Up to a Standard"* way of doing business.

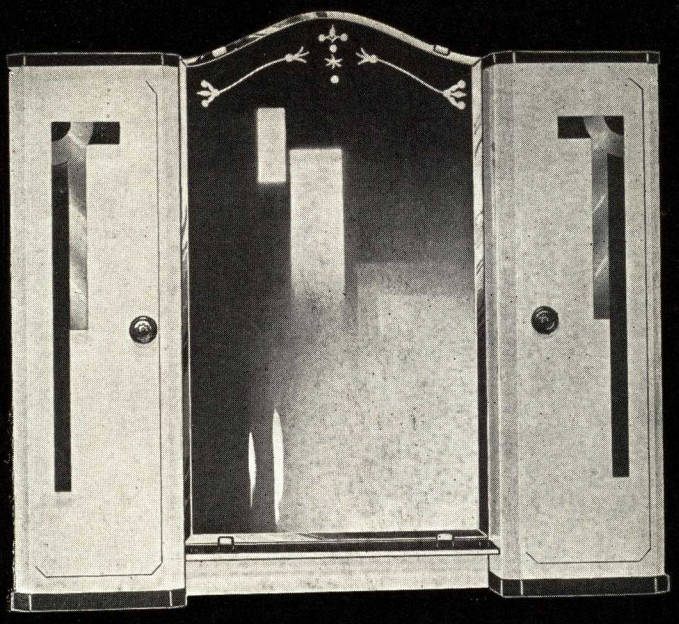




NATIONAL

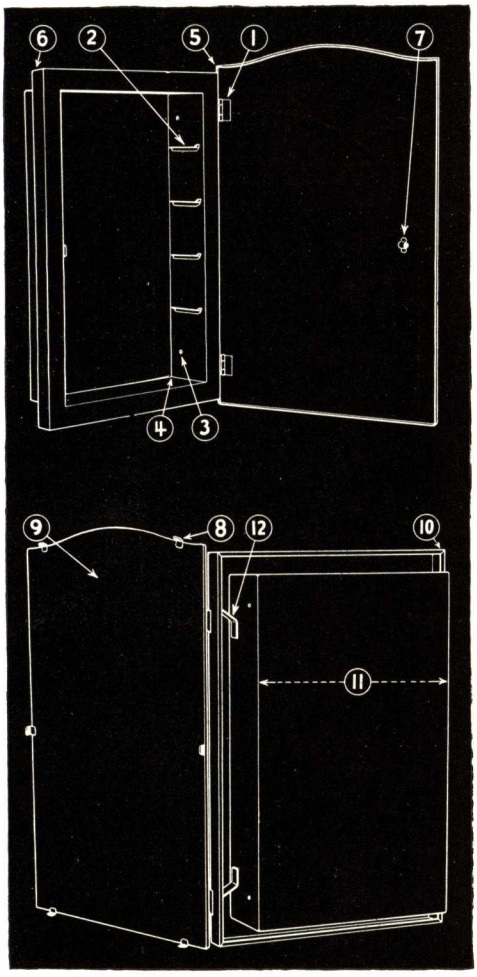
DeLuxe BATHROOM "*Cabinets with Character*"

17 YEARS of practical manufacturing experience in metal cabinets has earned for us a deserved and enviable reputation. You can share this favorable reputation by using National "Cabinets with Character." Below we show both front and back views of the Recessed DeLuxe Cabinets. The front view shows the inside of the cabinet box and the back of the one-piece steel mirror door. The back view shows the cabinet box and frame—also the front of the one-piece steel mirror door.



Exclusive Master Designed Two Compartment De Luxe Wall Cabinet For Surface Hanging

Only NATIONAL CABINETS HAVE THESE 13 EXCLUSIVE FEATURES



1. Concealed hinges welded to cabinet frame, not seen when door is closed, act as automatic door stop.
2. Shelf brackets have front edge turned up to hold adjustable plate glass shelves in place.
3. Holes punched for wood screws or bolts for anchoring recess cabinets. (Surface cabinets have key slots in metal back.)
4. All inside corners are finished smooth with no cracks to accumulate dirt and germs.
5. Over-shot door projects ½ in. beyond cabinet frame. No opening knob required. Back flange around entire outer edge of metal door keeps it rigid and prevents mirror breakage.
6. Return flange on cabinet frame, approximately 1⅛ in. deep, fits smoothly against tiling or plaster, adds strength, allows easy opening of door.
7. Ball spring latch is adjustable and is held in place by loop bracket welded to metal door.
8. Polished monel metal mirror clips are welded to door and will not rust.
9. One piece metal door with moisture proof pad. Highest quality plate glass mirror mounted with rubber pads under monel metal clips.
10. Corners mitred to fit, electrically welded and ground to smooth polished finish.
11. Recess dimensions of box are adapted to standard distances between studdings. (Special dimensions are made to order.)
12. Extra steel braces are welded from box to frame behind hinges to absorb shock when door is closed.
13. Highest quality mirrors are protected with copper coating.

GUARANTEE

We guarantee our products to be of the highest quality—and ask for the opportunity of replacing anything that is not absolutely satisfactory to our customers. Our guarantee is unconditional.

INDEX

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"DeLuxe" Cabinets—Recessed 4, 8
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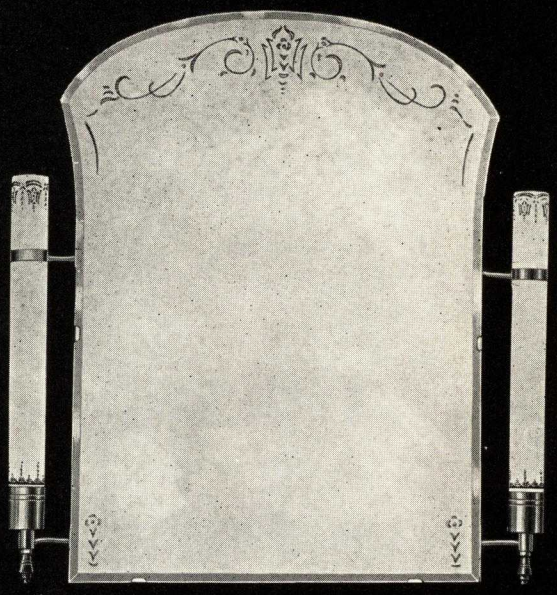


Style 1100

RECESSED

DeLuxe Electric Lighted Cabinets

. . . WITH OPAL GLASS SHADES

THE FOUR CABINETS pictured on this page are exquisitely designed and beautifully fabricated in every detail. With their mirrors delicately engraved in graceful curves . . . and their interiors finished in "Snowhite" lifetime baked enamel . . . these "Cabinets with Character" readily take their place in bathrooms expressing elegance and refinement . . .

The copper-backed mirror is "A" quality plate glass engraved in the Venetian style with a ⅜-in. bevel. It is mounted on a one-piece steel door, moisture-proof and padded . . . and held secure by polished monel metal clips.

The lights at the sides are covered by removable tubular shades of decorated or plain opal glass . . . consequently give a clear, warm even light. The arms and cups that hold the lamps and shades are made of brass, chromium plated. The wiring is concealed in the cabinet frame and passes the most severe underwriters' test.

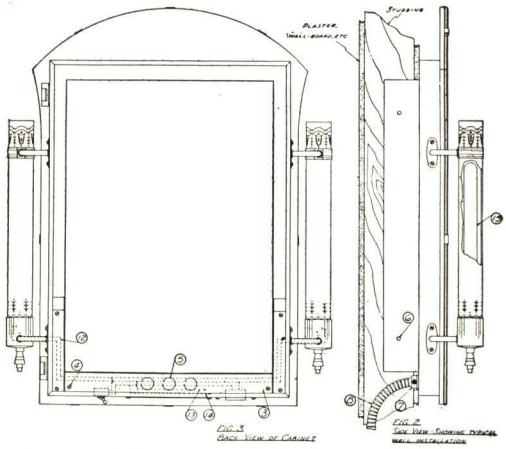


FIG. 3 BACK VIEW OF CABINET

FIG. 2 SIDE VIEW SHOWING TYPICAL WALL INSTALLATION

27/106

SPECIAL FEATURES

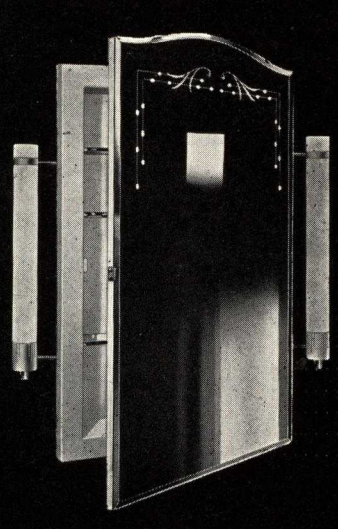
Convenience outlet for attaching electric devices, an important item . . . three plate glass shelves, adjustable . . . concealed door hinges . . . automatic door stop . . . adjustable friction ball catch on door. Prices include electric light globes.

BLUE PRINTS

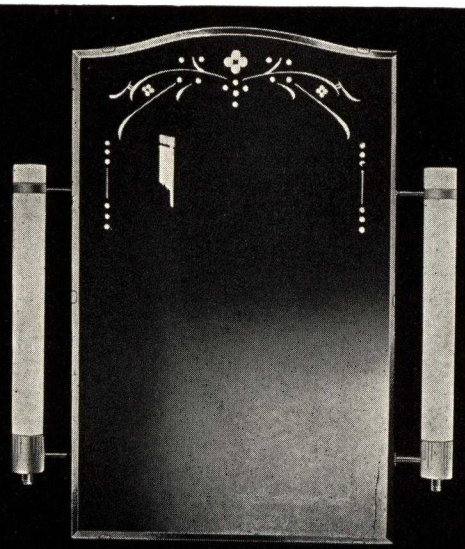
Detailed blue prints of these Cabinets will be sent gladly on request.

Style	Cabinet Frame, In.	Wall Opening, In.	Mirror, In.	Shipping Weight, Lbs.	List Price
1100	17 x23⅜x4	14½x20½x2⅞	19½x27½	55	**$45.50**
1103 1104 1106	16⅞x25⅞x4	13⅞x23⅛x2⅞	18 x28	48	**31.50**

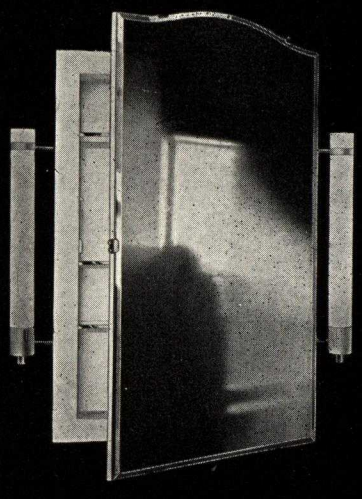
For monel metal frames around square top mirrors for styles 1106-1103-1104, add $4.00 to list price.



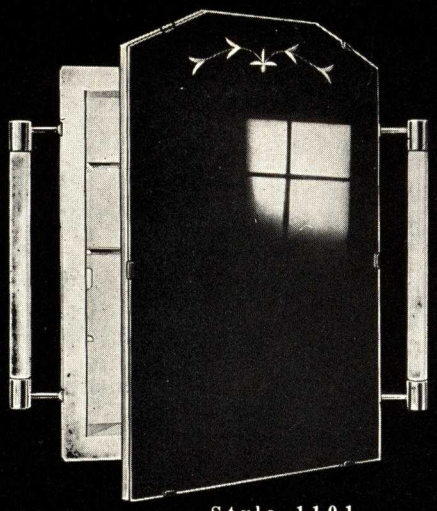
Style 1106



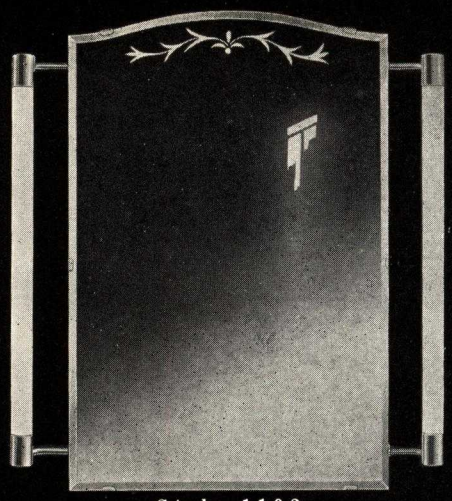
Style 1103



Style 1104



Style 1101

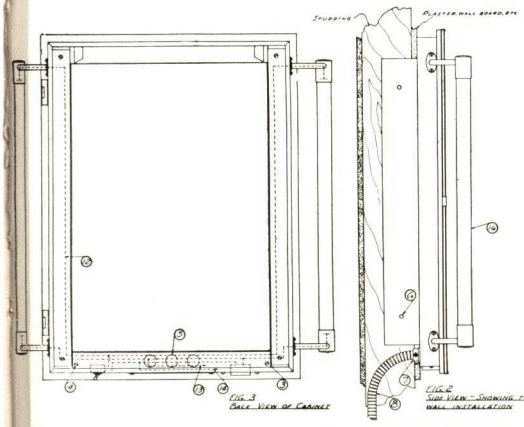


Style 1102

RECESSED *DeLuxe Electric Lighted Cabinets*

. . . WITH LUMILINE LIGHTS

DECIDEDLY modern in their designing, these four National "Cabinets with Character" are equipped with the popular Lumiline Lights. They are particularly well suited to bathrooms decorated in the more severe present-day modern style.



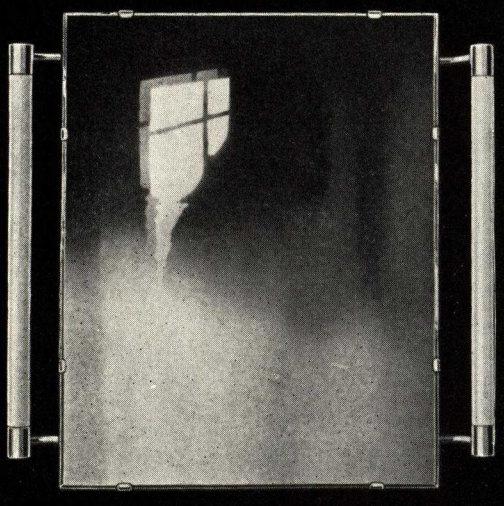
Like the models pictured on the opposite page, these Cabinets are permanently finished in "Sno-white" lifetime baked enamel. They likewise have full-vision copper-backed mirrors, of "A" quality plate glass, mounted on one-piece moisture-proof padded steel doors. (Style 1101 has engraved crystal mirror, finished edge, no bevel. Style 1102 has ⅜-in. bevel. Style 1107 and 1108 have narrow ⅛-in. bevel.) Styles 1101 and 1102 are handsomely engraved in the Venetian manner and give a rich yet unrestrained appearance. The Lumiline Lights . . . unsurpassed for shaving and make-up . . . not only produce long sources of light from both sides of the mirror—but illuminate the bathroom and eliminate shadows The wiring is concealed in the cabinet frame and passes the most severe Underwriters' test.

SPECIAL FEATURES

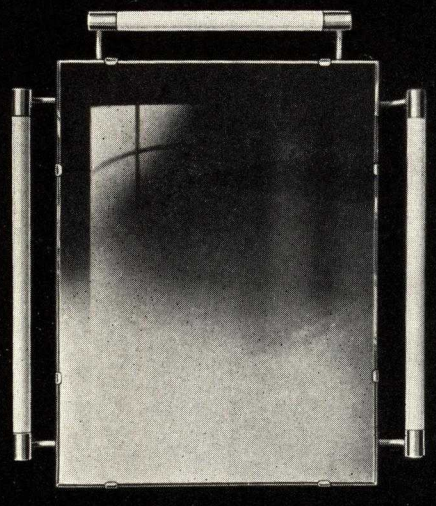
Convenience outlet for attaching electric devices, a welcome addition . . . two adjustable plate glass shelves (three on Style 1102) . . . concealed door hinges . . . automatic door stop . . . adjustable friction ball catch on door.

Style	Cabinet, In.	Wall Opening, In.	Mirror, In.	Lumline Lights	Shipping Wt., Lbs.	List Price
1101	15⅛x17⅜x4	13⅛x14⅞x2⅞	16x20	two 12-inch	28	**$19.25**
1102	15⅛x21⅝x4	13⅛x19⅝x2⅞	16x24	two 18-inch	36	**25.15**
1107	16¾x23 x4	14 x20⅛x2⅞	18x24	two 18-inch	42	**29.75**
1108	16¾x23 x4	14 x20⅛x2⅞	18x24	two 18-inch one 12-inch	45	**38.15**

For monel metal frame around mirror add $4.00 to list price for style 1107-1108. For style 1102 with square top, add $3.00.

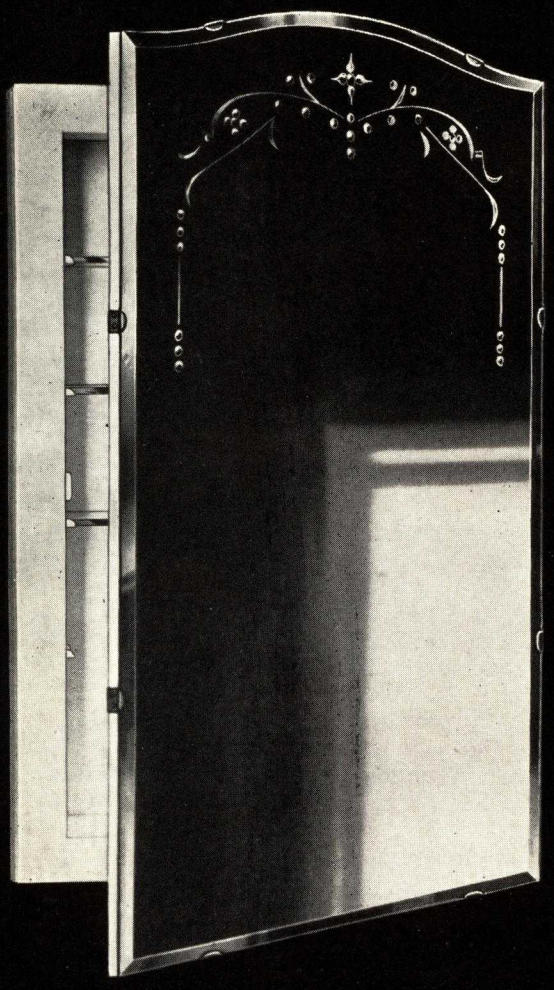


Style 1107



Style 1108

RECESSED
DeLuxe Wall Cabinets



Style D-500

OUR MOST POPULAR DeLuxe styles for wall mounting . . . truly "Cabinets with Character" . . . on display here and the opposite page. Their large expanse of mirror . . . gleaming, glistening Venetian plate glass . . . makes any one of these National Cabinets a fitting addition to the well-planned bathroom.

The copper-backed mirror . . . bowed at the top and beveled on all sides . . . is mounted on a one-piece steel door, moisture-proof and padded . . . and tightly held in position by polished monel metal clips.

The finish, of course, is "Sno-white" lifetime baked enamel. Special features include friction ball latch . . . three adjustable plate glass shelves . . . concealed hinges also act as door stop combination.

STYLE D-500 • This model . . . with its large beautifully etched mirror and its roomy interior . . . has proved our best seller for many years. Especially suitable for large bathrooms. Its curved top mirror is delicately etched in a fascinating bubble design. Truly an aristocrat among cabinets.

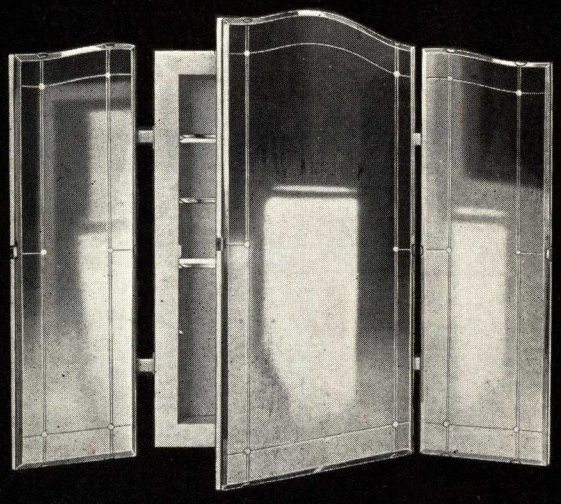
STYLE 775 • Same as Style D-500 . . . except it is furnished without etching.

STYLE 875 • This is the recess cabinet (only) in the center of the three-section shown below at the left. Its curved top Venetian beveled plate mirror is bordered by smart mitered lines.

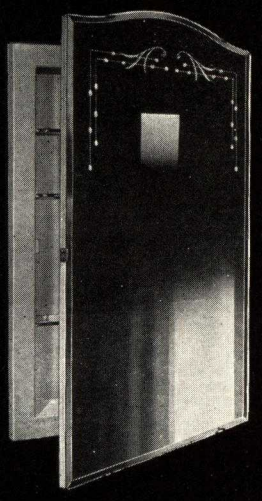
STYLE 1875 • Consists of Recess Cabinet Style 875 with vanity mirror wings on either side . . . as pictured. The wing mirrors are Venetian plate glass, beveled . . . with mitre lines to match the center mirror. Each wing measures 8⅞x26¾ in. . . . is easily adjusted to any angle. Overall width, with wings extended is 38 in.

STYLE 975 • Same style and specifications as D-500. The only difference is the mirror design. This design with its vertical lines is recommended for bathrooms with low ceilings.

Monel metal frame around mirror will be made to special order by squaring the mirror straight across the top on styles D-500-875-975-775. Add $4.00 to the printed prices. For style 10, page 7, add $3.00.



Styles 875-1875



Style 975

Style 775

STYLE 10 • Our second best seller . . . popularly priced—but built with the typical high quality of all National Cabinets. Mirror is tastefully etched in floral design. This cabinet furnished to special order with square top mirror and monel metal frame for $3.00 additional.

STYLE V-550 • Same mirror design as Style D-500 pictured on opposite page . . . except in smaller, more convenient size.

STYLE 750 • Especially designed for bathrooms that demand an elaborately etched mirror. The exceedingly rich appearance of the model is due to the unusual way it is engraved; alternating fully-polished and satin-finish etching around its entire outside edge.

STYLE S-900 • This is the Recess Cabinet Style C-901 with vanity mirror wings added on both sides . . . as pictured. Wing mirrors are engraved to match the center mirror and have curved tops. Each wing measures 8x18¾ in. and is easily adjusted to any angle. Overall width, with wings extended is 34 in. **Style C-901 is recessed cabinet with center mirror only.**

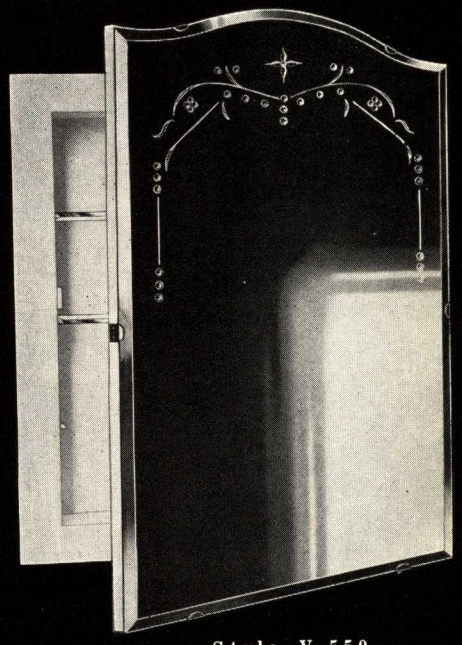
STYLE 880 • New, exclusive model . . . with round recessed cabinet and round narrow beveled mirror of finest quality plate glass . . . 23 in. in diameter. Especially effective in bathrooms designed in the ultra-modern style and very smart for the powder room.

Style	Frame, Inches	Wall Opening, Inches	Mirror, In.	Shelves	Shipping Wt., Lb.	List Price
D-500, 775 } 875, 975 }	16⅞x25⅞x4	13⅞x23⅛x2⅞	18x28	3	35	**$17.50**
1875	16⅞x25⅞x4*	13⅞x23⅛x2⅞	18x28*	3	52	**34.30**
10	15 x22 x4⅛	13⅛x20 x3⅛	16x24	3	24	**13.85**
V-550	16⅞x19⅞x4	13⅞x17⅛x2⅞	18x22	2	28	**15.05**
750, C-901	15 x17¾x4	13¼x16 x2⅞	16x20	2	24	**13.85**
S-900	15 x17¾x4*	13¼x16 x2⅞	16x20*	2	38	**25.20**
880	20¼ diam.	17 x18¼x2⅞	23 diam.	4	28	**23.45**

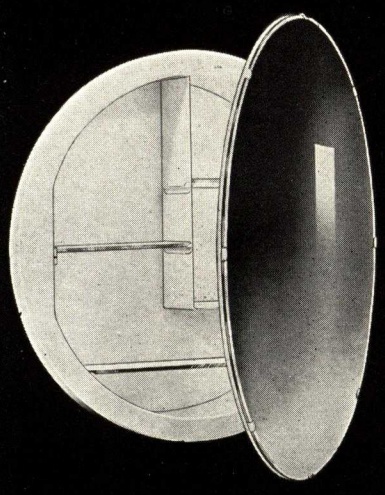
* Plus wings.

Other recessed models on next page

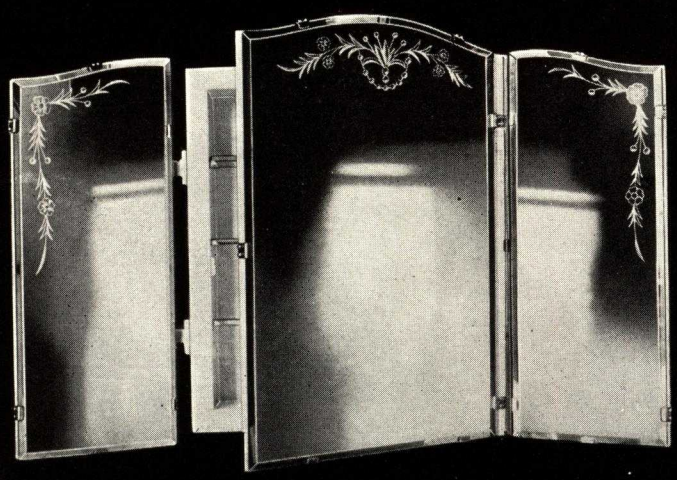
Style 10



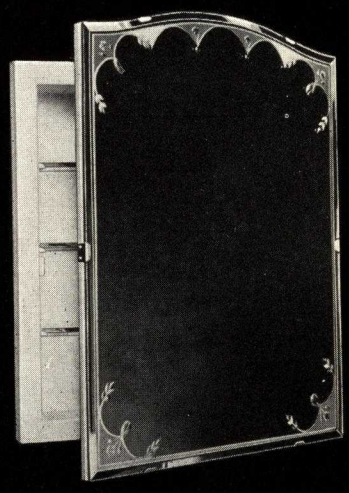
Style V-550



Style 880

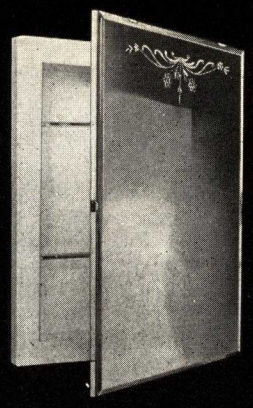


Styles S-900 & C-901



Style 750

Style 225



Style C-200

RECESSED *De Luxe Cabinets*

STYLE 225 • Narrow ⅛-in. bevel gives this model full vision and a rich dignified appearance. Same features as the models pictured on pages 6 and 7 . . . copper-backed mirror of "A" quality plate glass mounted on a one-piece door . . . "Sno-white" lifetime baked enamel finish. Two shelves.

STYLE C-200 • An unusually popular "Cabinet with Character." Engraved Venetian copper-back mirror of "A" quality plate glass . . . ⅜-in. bevel mounted on one-piece padded metal door. Same features as other recessed models on pages 6 and 7. Two shelves.

Style	Cabinet, In.	Wall Opening, In.	Mirror, In.	Shipping Wt., Lb.	List Price
225	16¾x23 x4	13⅞x20⅛x2⅞	18x24	32	**$16.05**
C-200	16¾x20⅝x4	13⅞x18 x2⅞	18x22	29	**15.05**

Add $4.00 to list price for monel metal frame.

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SURFACE *De Luxe Wall Cabinets*

FOUR popular "Cabinets with Character" for surface mounting. Mirror is mounted on one-piece padded steel door . . . and held secure by polished monel metal clips. Special features include friction ball catch and concealed hinges which also act as automatic door stop.

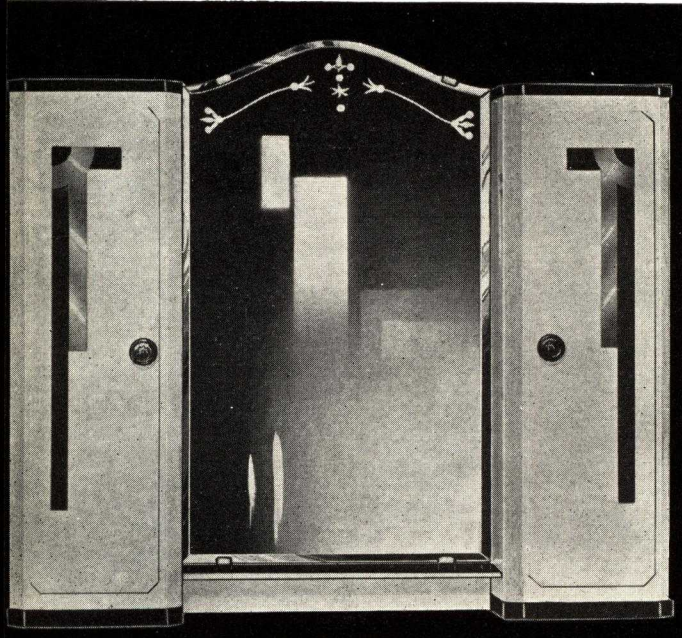
STYLE 400 • An exclusive model with glass shelf and two side cabinets. Mirror is Venetian beveled plate glass, bowed at top and strikingly engraved. Below the mirror is mounted the plate glass shelf, 3x14 in. Cabinets are finished in "Sno-white" lifetime baked enamel and are decorated in black enamel and polished monel metal. Each compartment, 7½x24x4 in. has three adjustable plate glass shelves and black bakelite knob.

STYLE 12 • Another important National "DeLuxe" Cabinet. Mirror of Venetian beveled plate glass is attractively engraved in floral design and has curved top. Moderate in price—but typical National quality.

STYLE B-100 • Specially designed and priced for small, inexpensive bathrooms. Its Venetian beveled mirror is engraved in an unusually attractive design Flat top.

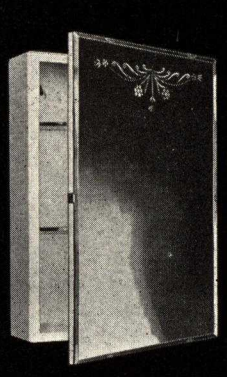
STYLE 28 (also 29, 30) • New members of the "De-Luxe" line. Very popular and reasonable in price. Engraved crystal mirror. Styles differ only in size.

Style	Cabinet, In.	Mirror, In.	Shelves	Shipping Wgt., Lb.	List Price
400	29⅜x26½x4½	14x24	7 (glass)	38	**$25.90**
12	15⅛x22 x4	16x24	3 (glass)	24	**13.15**
B-100	14⅞x21 x5	16x22	2 (glass)	30	**12.90**
28	10¼x16 x3½	11x18	2 (steel)	9	**3.70**
29	12 x17½x4	13x20	2 (steel)	12	**5.95**
30	15⅛x17¼x4	16x20	2 (glass)	19	**8.15**

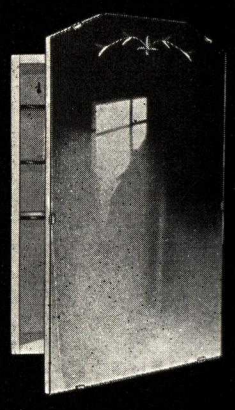


Style 400

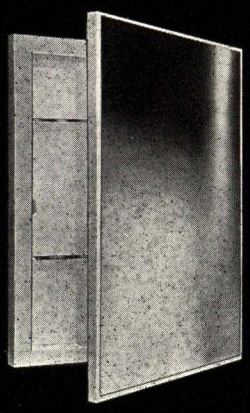
Style 12



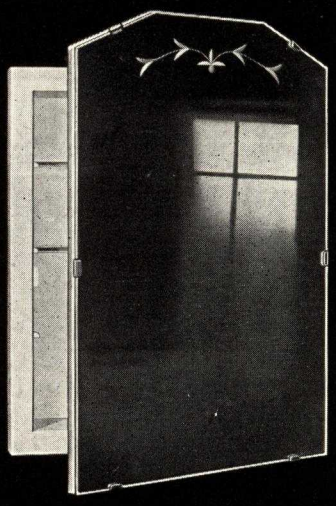
Style B-100



Styles 28-29-30



Style 50



Styles 53-51-52

Style 360

RECESSED
"Utility" Wall Cabinets

A SPECIAL GROUP of National Cabinets designed for installations where initial cost is a determining factor "Utility" Cabinets have the same strength and rigidity characteristics of higher-priced National Cabinets. They are electrically welded into one-piece construction . . . no rough edges or exposed nuts, bolts or screws. Finished in National's famous "Sno-white" lifetime baked enamel. Mirror of finest quality plate glass (except as stated in individual description) is mounted on one-piece padded metal door and held secure by polished monel metal clips.

STYLE 22 (also 23, 33, 43) • Shelves totally enclosed. Built unusually strong to withstand hard usage. Prices with beveled mirror. Plain mirrors for **less** money. Glass shelves. Styles differ only in size.

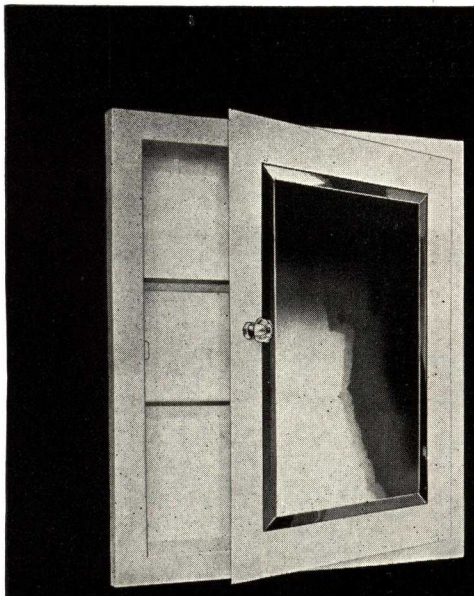
Style	Cabinet, In.	Wall Opening, In.	Mirror, In.	Shelves	Shipping Wt., Lb.	List Price
50	15 x17 x4	13⅛x15¼x3	16x18	2	16	**$ 6.95**
53	12 x17½x4	10⅛x15⅝x3	13x20	2	18	**7.45**
51	15 x17 x4	13⅛x15¼x3	16x20	2	20	**8.35**
52	15 x22 x4	13⅛x20 x3⅛	16x24	3	24	**11.15**
360	14⅜x20½x4	11⅞x17⅞x2¾	12x18	2	19	**12.35**
O-22	16¾x26⅝x4	13⅞x23½x2⅞	10x14	3	25	**11.00**
O-23	18½x28¼x5	15½x25½x3¾	12x16	3	32	**13.10**
O-33	20⅜x30⅜x5	17½x27½x3¾	14x18	3	35	**14.85**
O-43	22 x34½x5	19¼x31½x3¾	16x22	3	45	**18.65**
22	16¾x20⅝x4	13⅞x17¾x2⅞	10x14	3	21	**9.90**
23	18½x22¼x5	15½x19½x3¾	12x16	2	28	**11.65**
33	20⅜x24⅜x5	17½x21½x3¾	14x18	3	32	**13.75**
43	22 x28¼x5	19¼x25½x3¾	16x22	3	41	**17.85**

STYLE 50 • Plain crystal mirror . . . enclosed with narrow frame of white enameled steel. A splendid value; priced to meet competition.

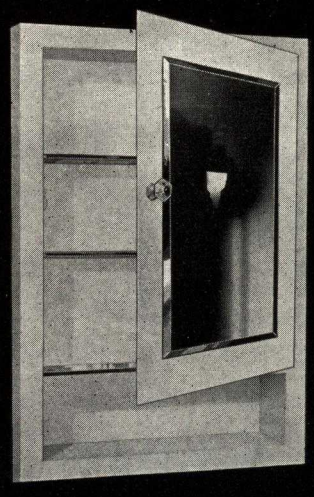
STYLE 53 (also 51, 52) • New "Utility" models . . . with engraved crystal mirror with full-finished edge. "Clipped" top corners. Adjustable plate glass shelves. Styles differ only in size.

STYLE 360 • Another "Utility" Cabinet . . . finished with "Sno-white" lifetime baked enamel and beveled frame in a series to give a rounded, modern effect. Mirror has ⅜-in. bevel and is mounted on metal door which opens from and closes against the cabinet frame.

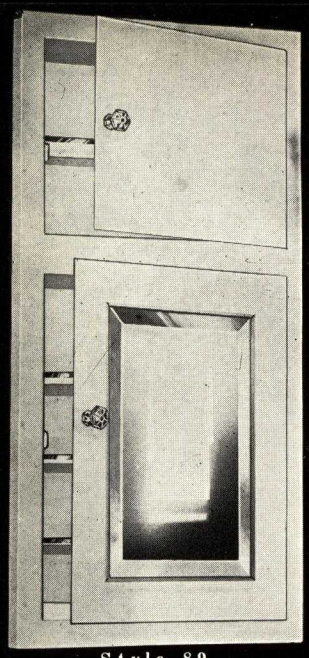
STYLE O-22 (also O-23, O-33, O-43) • Standard cabinets with white frame and open bottom shelf. Built to standard hard use. Prices with beveled mirror. Plain mirrors for **less** money. Glass shelves. Styles differ only in size.



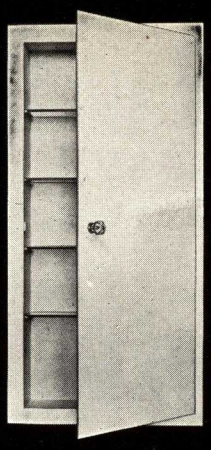
Styles 22-23-33-43



Styles 022-023-033-043



Style 89



Style 4

Style 3

RECESSED *Cabinets for Special Uses*

THREE specialty cabinets strongly built in typical National one-piece steel construction . . . "Sno-white" lifetime baked enamel . . . invisible hinges with stop combination . . . friction ball catch . . . crystal glass knobs . . .

STYLE 89 • Combination Two-Door Cabinet of unusual utility . . . with supply compartment for towels, soap and other articles. This cabinet can be used with **either end up** (the four plate glass shelves are reversible); the supply compartment can be either on the top or the bottom. Mirror, beveled plate glass: 10 x 14 in. Towel compartment: 13¾ x 10 x 5 in. Cabinet proper: 13¾ x 17½ x 5 in.

STYLE 4 • Linen Cabinet . . . for towels, linen and general utility storage. Vermin-proof and easy to keep clean. Four adjustable plate glass shelves.

STYLE 3 • Telephone Cabinet . . . all metal . . . ready to build into the wall. Compartment at bottom provides ample space for wiring, bell box and directories. When open, door (14 x 12 in.) becomes desk. Shelf for telephone: 5½ x 13 in.

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Style	Cabinet, In.	Wall Opening, In.	Shipping Wt., Lb.	List Price
89	16¾x32⅝x5	14⅛x30 x3¾	35	**$11.15**
4	16⅞x37 x5	13⅞x34¼x3¾	33	**9.50**
3	16⅞x29⅞x4	13⅞x27⅞x3	20	**9.60**

SURFACE *Cabinets for Special Uses*

FOUR steel cabinets designed for daily uses in offices, stores, filling stations and factories. Reasonable in price. Easy to keep clean. Finished in "Sno-white" baked enamel.

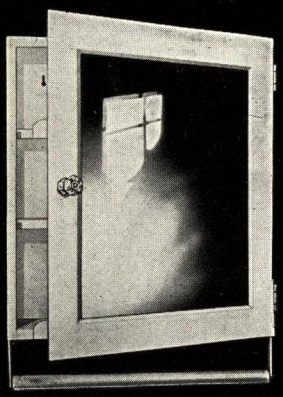
STYLE 64 (also 65, 66, 67) • Towel Cabinet with mirror, detachable towel roller same width as cabinet, three stationary steel shelves and stainless steel soap dish. Also available in the new Black Crackle finish that does not show finger marks. Styles 64 and 66 have crystal mirrors. Styles 65 and 67 have plain plate mirrors.

STYLE 60 (also 61) • A durable, inexpensive cabinet with 14-in. towel roller and one steel shelf. Plain crystal mirror. Styles differ only in size. Style 61 has 16 inch towel roller.

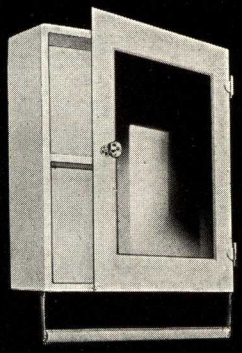
STYLE A-1 (also A-2, A-3) • Standard low-price wall cabinet with bevel plate mirror and two shelves, concealed hinges and friction catch. Styles differ only in size. Style A1 has steel shelves. Styles A2-A3 has removable glass shelves.

STYLE C-C-4 (also C-C-5) • Corner Cabinets with three adjustable steel shelves and friction ball latch. Style C-C-4 has mirror of finest quality beveled plate glass. Style C-C-5 without mirror.

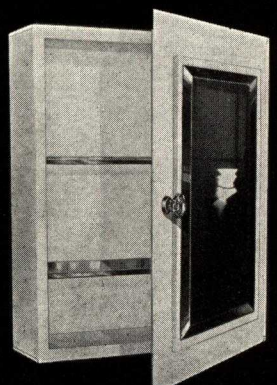
Style	Cabinet, In.	Mirror, In.	Shipping Wt., Lb.	List Price
64	18 x20x5½	14x16	20	**$ 8.35**
65	18 x20x5½	14x16	20	**9.65**
66	16 x20x5½	12x16	17	**7.45**
67	16 x20x5½	12x16	17	**8.75**
60	14¼x16x5	10x12	13	**5.60**
61	16 x18x5	12x14	16	**6.65**
A-1	14¼x20x5	10x12	15	**7.00**
A-2	16¼x20x6	10x12	21	**8.15**
A-3	17½x21x5	12x16	24	**9.65**
C-C-4	16½x20x8	12x16	20	**11.25**
C-C-5	16½x20x8	None	15	**7.25**



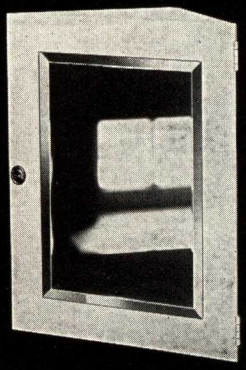
Styles 64-65-66-67



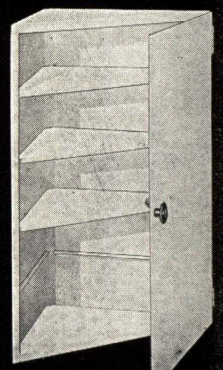
Styles 60-61



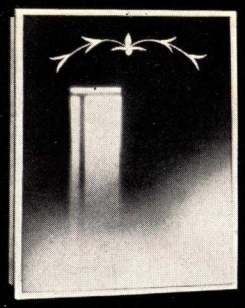
Styles A1-A2-A3



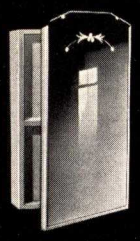
Styles CC4



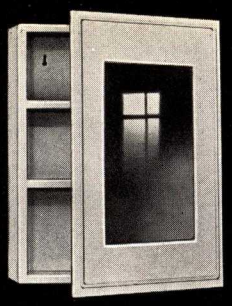
CC5



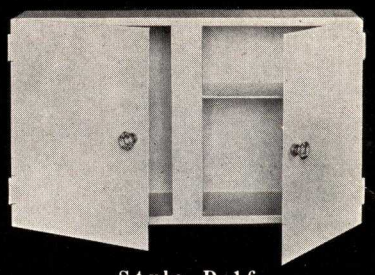
Style 26



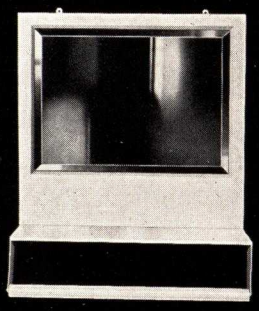
Style 27



Style 25

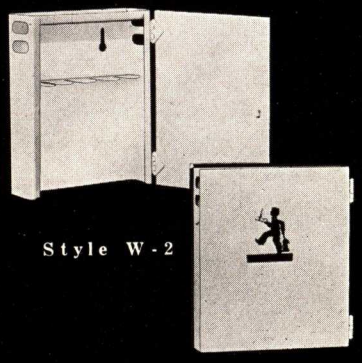


Style D-16



Style M-145

Style W-1



Style W-2

SURFACE

"Economy" Wall Specialties

STYLE 25 ● One of our best sellers. Plain crystal mirror enclosed in beaded steel frame . . . "Sno-white" enamel finish . . . two steel shelves. Cabinet: 13½x17½x5 in. Mirror: 9x12 in. Shipping weight 12 lb. List price **$3.70.**

STYLE D-16 ● Double cabinet for bathroom or kitchen . . . each compartment with separate solid metal door . . . "Sno-white" baked enamel finish. 23x13x6 in. Shipping weight 15 lb. List price **$5.25.**

STYLE M-145 ● Framed beveled plate glass mirror with glass shelf and 18 in. detachable towel bar . . . "Sno-white" baked enamel finish. 18x23 in. Shipping weight 21 lb. List price **$7.35.**

STYLE 26 ● Engraved crystal mirror in white enamel steel frame . . . two steel shelves . . . "Sno-white" enamel finish. Exceptional value. Cabinet: 13½x17½x5 in. Mirror: 14x18 in. Shipping weight 12 lb. List price **$4.85.**

STYLE 27 ● Full mirror door . . . one steel shelf . . . jade green enamel finish. Inexpensive. Cabinet: 10¼x16x3½ in. Engraved crystal mirror: 11x18 in. Packed 3 to a carton. Shipping weight (for 3) 19 lb. List price each **$2.20.**

STYLE W-1 ● Hide-A-Way Water Bottle Cabinet. An ingenious cabinet provided with hook for bottle and hose and compartment for other equipment . . . "Sno-white" baked enamel finish. 11x17x3 in. Packed 3 to a carton. Shipping weight (for 3) 12 lb. List price each **$2.05.**

STYLE W-2 ● Sanitary metal cabinet for four tooth brushes. Ventilated top and sides and open bottom . . . top recessed to hold tube of paste . . . assorted transfer decoration. 5¾x5x1 in. Packed 6 to a carton. Shipping weight 5 lb. List price each **$0.70.**

NATIONAL

Wall Mirrors

. . . WITH CHARACTER

THESE MIRRORS of "A" quality plate glass are mounted on a one-piece, padded steel back . . . and are equipped with concealed hangers to hang flush with the wall.

STYLE M-134 ● A medium size mirror suitable for any room . . . beveled plate glass . . . etched in pleasing floral design. Back finished in black lustre or "Sno-white" baked enamel. 16x24 in. Shipping weight 20 lb. List price **$7.35.**

STYLE M-132 ● Finest quality plate glass mirror decorated with both polished and satin finish etching. Back finished in black lustre or "Sno-white" baked enamel. 18x28 in. Shipping weight 24 lb. List price **$10.75.**

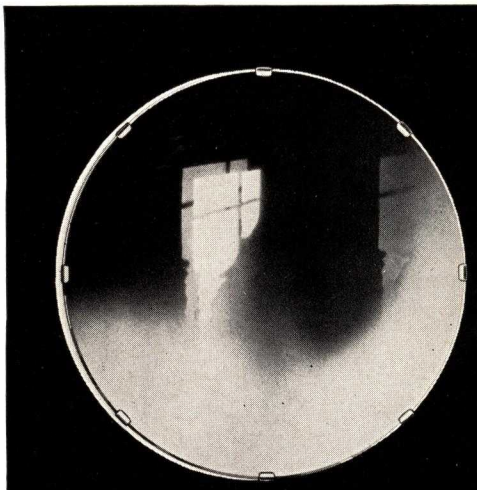
STYLE M-133 ● Same size—no engraving. List price **$9.90.**

STYLE 142 (also 143) ● Beveled plate glass mirror with steel frame and back finished in "Sno-white" baked enamel. Overall size: Style 142, 14⅝x18⅝ in. Shipping weight 12 lb. List price **$6.15.** Style 143, 16⅝x20⅝. Shipping weight 15 lb. List price **$7.05.**

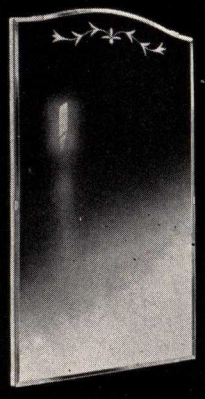
STYLE M-770 ● Modern circular mirror of unusual rich appearance . . . narrow ⅛-in. bevel and full finish edge . . . 23-in. diameter. Best plate glass. Shipping weight 15 lb. List price **$14.85.**

STYLE M-1622 ● Beveled plate glass mirror built to give years of hard service. Framed in a rust-proof band of polished monel metal. Ideal for stores, offices and public buildings. 16x22 in. Shipping weight 20 lb. List price **$9.75.**

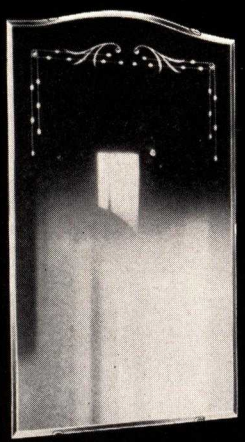
NATIONAL METAL PRODUCTS COMPANY, WATERLOO, IOWA



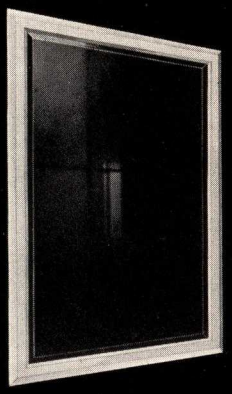
Style M-770



Style M-134



Styles M-132 & M-133



Styles M-142 & M-143

Style M-1622

NATIONAL

"Cabinets with Character"

NATIONAL METAL PRODUCTS COMPANY

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WATERLOO ★ IOWA

27
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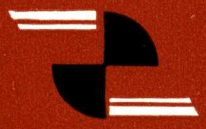
BATHROOM ACCESSORIES



CHARLES PARKER

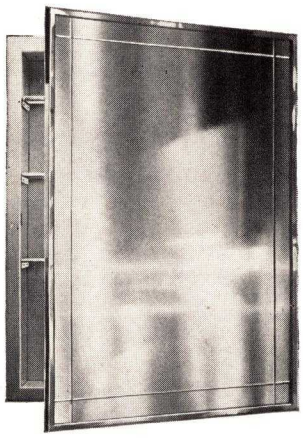
THE CHARLES PARKER COMPANY

MERIDEN, CONN.

NEW YORK OFFICE, 101 Park Avenue

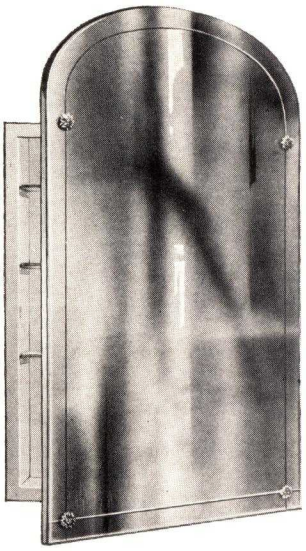
NEW YORK DISPLAY, Architects Samples Corp.

THE PARKER 6000 LINE For Highest Quality Work



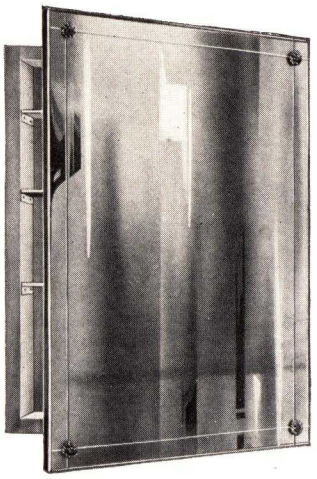
No. 6001

Cat. No.	Mirror	Rough Open.	List Price
6001	20 x 26	18 x 24 x 4	$45.00
6001-A	18 x 24	16 x 22 x 4	35.00



No. 6002

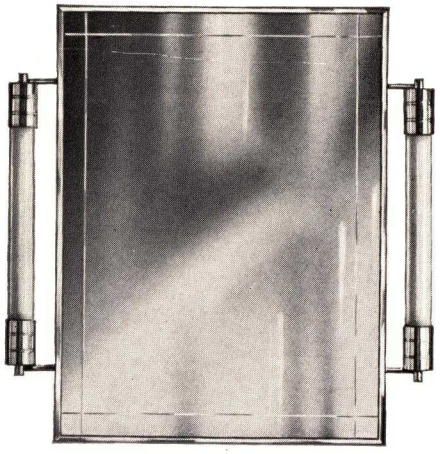
Cat. No.	Mirror	Rough Open.	List Price
6002	20 x 32	18 x 24 x 4	$50.00
6002-A	18 x 28	16 x 22 x 4	45.00



No. 6003

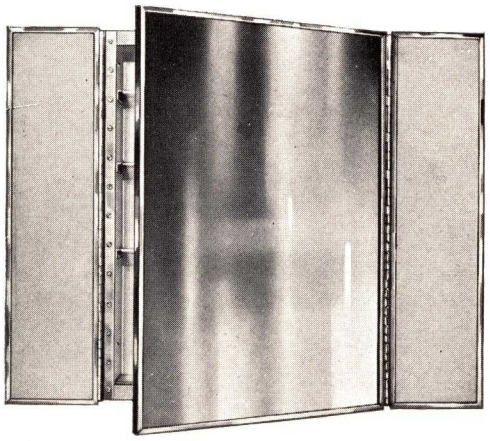
Cat. No.	Mirror	Rough Open.	List Price
6003	20 x 26	18 x 24 x 4	$45.00
6003-A	18 x 24	16 x 22 x 4	35.00

Light Cabinets



TUBULAR LIGHT CABINET

Cat. Nos.	
6001-TL	6001-ATL
Mirror	
20 x 26	18 x 24
Rough Open.	
18 x 24 x 4	16 x 22 x 4
List Price	
$70.00	$60.00



INDIRECT LIGHT CABINET

Cat. No.	6001-IL
Overall Size	29 x 25¼
Rough Open	28 x 24
List Price	$140.00

DESCRIPTION

No. 6000 Line Cabinets recesses are electrically welded showing no joints or seams. Six coats of Parkeroid, a duco base lacquer, gives a beautiful and durable finish. Three plate glass shelves are supported by chromium plated brass adjustable brackets. A plate glass bottom shelf is also furnished.

Mirror is "A" quality electro copper backed. Chromium Plated Brass door frames where furnished are ⅜-in. face, 5 sided channel, making very rugged and tightly packed door construction. Exterior furnished in color at no extra charge.

Other styles available.

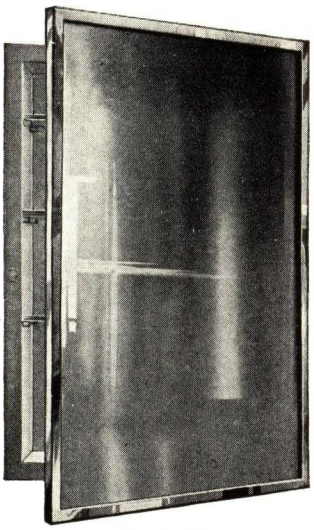
These numbers can be furnished in mirrors only at 60% of list price.

Light Cabinets

No. 6001-TL Tubular Light Cabinet is best quality cabinet. It is made to take 12-in. tubular lights which are covered with opal shades to prevent glare or spottiness. A toggle switch is supplied on bottom flange of cabinet. This cabinet is available in all styles. Add $25.00 to regular list.

No. 6001-IL Indirect Light Cabinet has light troughs on each side for 18-in. lumiline light bulbs. A strong, soft light is reflected and diffused through opal glass. The source is not visible.

THE PARKER 7000 LINE For Medium Quality Work



No. 7007

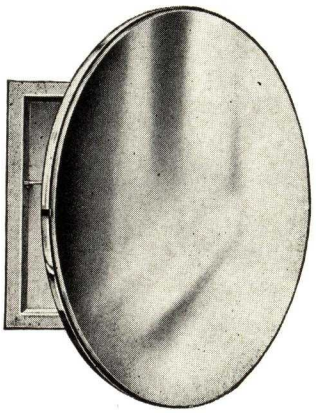
1/2-in. Face Chromium Plated Brass Angle Frame

Mirror	Rough Open.	List Price
17 x 25	15¼ x 23¼ x 4	$23.00

No. 7008

1/2-in. Face Chromium Plated Brass Channel Frame

Cat. No.	Mirror	Rough Open.	List Price
7008	20 x 28	17¾ x 25¾ x 4	$33.00
7008-A	18 x 24	15¾ x 21¾ x 4	27.00
7008-B	16 x 22	13¾ x 19¾ x 4	24.00



No. 7012
CIRCULAR MIRRORED CABINET

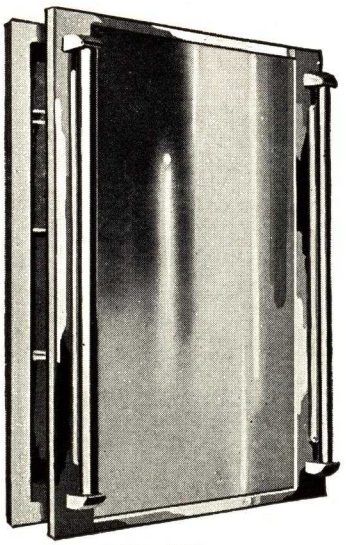
Mirror Size	Rough Open.	List Price
24 in. diam.	14¼ x 14¼ x 4	$35.00

Mirror only with clips

24 in. diam.	$12.00
30 in. diam.	16.00
36 in. diam.	24.00

Mirror only with chromium plated brass frame

24 in. diam.	$30.00
30 in. diam.	40.00
36 in. diam.	50.00



No. 7001
LUMILINE LIGHT CABINET
Pat. DES-102,414

Mirror	Rough Open.	List Price
17¾ x 23	15¾ x 21¾ x 4	$42.00

No Bulbs Furnished
Add $1.00 List for Switch
Add $2.00 List for Con. Outlet

DESCRIPTION

The 7000 Line of cabinets are formed from heavy gauge auto-body steel electric welded with reinforced corners and no exposed joints or seams. Their finish is white enamel. Three bulb edge glass shelves are supported by adjustable chromium plated brass brackets.

The mirrors are electro copper backed polished 1/4-in. plate glass. Framed mirrors are furnished with heavily chromium plated brass frames. Hardware is all chromium plated.

No. 7007 Cabinets has 1/2 x 5/8-in. angle mirror frame with brazed corners, patented hinge and 1/2-in. return flange.

No. 7008 Cabinets has a 1/2 x 1/2 x 1/2 channel frame spring bullet catch and 1/2-in. return flange.

Nos. 7009, 7010 and 7011 Cabinets are all-over white enamel cabinets furnished with glass knob and chromium plated butt hinges. Return flange is 1 1/4-in. These are practical for service quarters, hospitals and other public buildings. The 7010 has open shelf at bottom. The 7011 is wall type.

No. 7001. This Cabinet furnishes balanced indirect light, entire length of Mirror. Is sufficiently strong to illuminate entire bathroom eliminating other light fixture. Source of light is where most needed and Shaded 18-inch Bulb gives soft clear non-glare illumination. Excellent solution to cabinet and lighting problems. Wiring connection made at top of recess.

Add $1.50 to List Price if Mitre Line Required

No. 7013

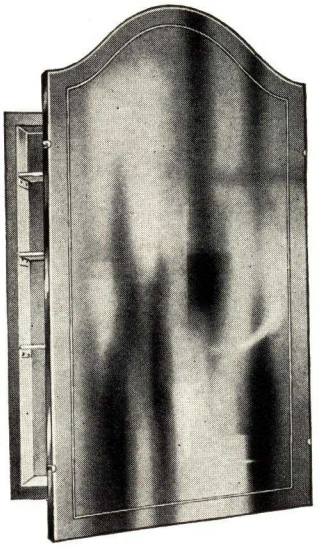
Overall	Rough Open.	List Price
20 x 32	17¾ x 23¾ x 4	$30.00

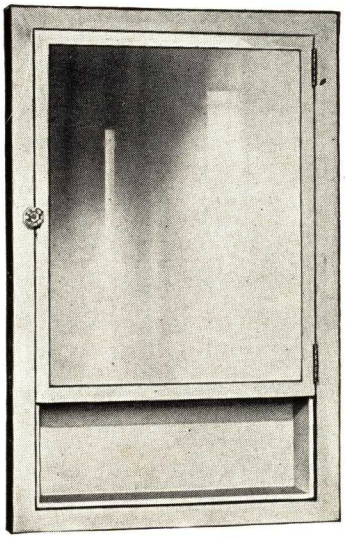
No. 7013-A

Overall	Rough Open.	List Price
18 x 28	15¾ x 21¾ x 4	$26.00

No. 7013-B

Overall	Rough Open.	List Price
16 x 26	13¾ x 19¾ x 4	$24.00





No. 7010
As Illustrated

Mirror	Overall	Rough Open.
14x18	17½x27½	15½x25½x4

List Price $14.50

No. 7010-A

Mirror	Overall	Rough Open.
12x16	15½x25½	13½x23½x4

List Price $13.00

FULL DOOR
No. 7009

Mirror	Overall	Rough Open.
14x18	17½x21½	15½x19½x4

List Price $13.00

No. 7009-A

Mirror	Overall	Rough Open.
12x16	15½x19½	13½x17½

List Price $11.50

THE SIMPLICITY DESIGN

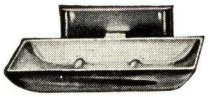
Patent No. Des. 101,210

No. 226
SINGLE HOOK
List Price $1.20

No. 202
TOWEL SHELF

Size	List Price
6 x 24	$7.20
6 x 18	6.90

No. 227
DOUBLE HOOK
List Price $1.50



No. 210
METAL SOAP HOLDER
Specify Drain Hole Wanted
List Price $2.40

No. 218
CRYSTAL SHELF

Size	Crystal	Black
5/16 x 5 x 18	$4.50	$5.70
5/16 x 5 x 24	4.70	6.40
5/16 x 5 x 30	5.00	7.10

No. 215
TUMBLER AND TOOTH BRUSH HOLDER
List Price $2.40

No. 220
SQUARE TOWEL BAR

Size	All Metal
3/4 x 18	$4.00
3/4 x 24	4.30
3/4 x 30	4.70

No. 200
LUMILINE LIGHT BRACKET
Bracket Only $8.00
Bracket and Caps $10.00
Bracket and Shade 12.00
Gem Box Required
18 in. Bulb Required

No. 221
TOWEL BAR

Size	Crystal	Black	All Metal
1 x 18	$4.30	$4.70	$4.80
1 x 24	4.50	5.00	5.10
1 x 30	4.80	5.40	5.50

No. 224
VERTICAL GRAB BAR

Size	List Price
1 in. x 18 in.	$4.20
1 in. x 24 in.	4.80
1 in. x 36 in.	6.00

No. 222
TOWEL BAR

Size	Crystal	Black	All Metal
3/4 x 18	$3.50	$3.80	$3.50
3/4 x 24	3.60	4.00	3.70
3/4 x 30	3.70	4.20	4.00

CONCEALED PLATE
For Screw or Toggle Bolt Fastening
Furnished Regularly

No. 223
ALL METAL BAR

Size	List Price
3/4 x 18	$3.60
3/4 x 24	4.10
3/4 x 30	4.60

ANCHOR PLATE
For Tile Walls or Solid Masonry
Specify if this type plate is required

THE ROUND DESIGN For Standard Quality Work

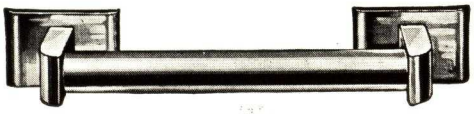
No. 216
TOOTH BRUSH HOLDER
List Price $1.50

No. 217
PAPER HOLDER
Wood Roller $2.90
Metal Roller 3.90

No. 214
TUMBLER HOLDER
List Price $2.40

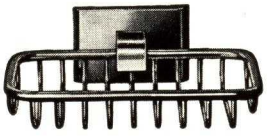
No. 219
SOAP AND GRAB BAR
List Price $4.80

No. 211
SOAP HOLDER
With Liner
List Price $3.00
CHROME LINER
List Price $4.80



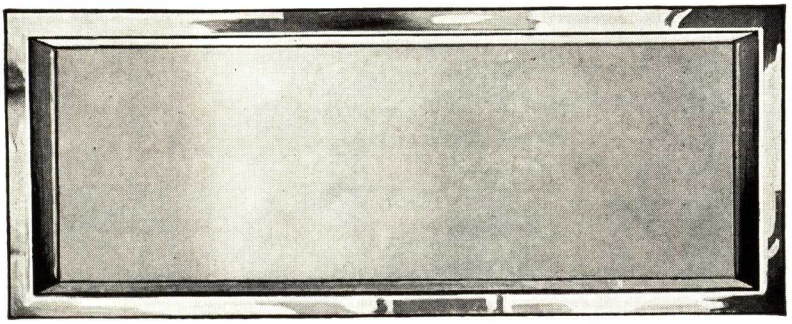
No. 212
GRAB BAR

Size	List Price
¾ x 9	$3.40
1 x 9	4.10

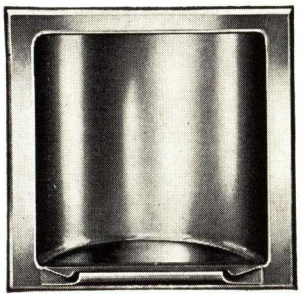


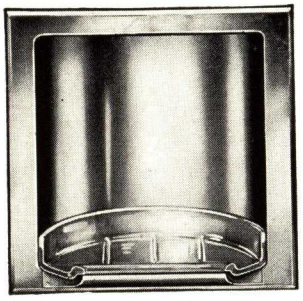
No. 213
SOAP HOLDER
For Shower
List Price $3.00

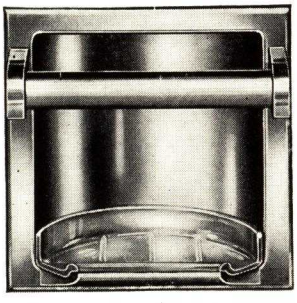
RECESSED ITEMS

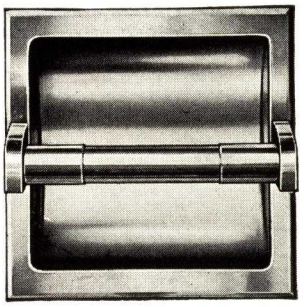


No. 232
STAINLESS STEEL RECESS SHELF
Overall 17 x 7 Recess 16 x 6 x 4 List Price $10.00









Overall Size 6⅛ x 6⅛—Wall Opening 5½ x 5½ x 2

No. 231
TUMBLER HOLDER
List Price $3.70

No. 229
SOAP HOLDER
List Price $4.20

No. 230
SOAP AND GRAB
List Price $5.40

No. 228
PAPER HOLDER
Wood Roller $4.20
Chrome Roller 5.20

Furnished Regularly with Lugs for Masonry. Specify if for Wood Construction.

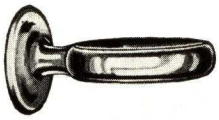
THE ROUND DESIGN

No. 476-R
TUMBLER HOLDER
List Price $3.50

No. 972-R
COMBINATION TUMBLER
and TOOTH BRUSH HOLDER
List Price $4.10

No. 976-R
TOOTH BRUSH HOLDER
List Price $2.00

No. 977-R
TOOTH BRUSH HOLDER
List Price $1.80

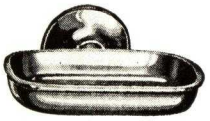


No. 855-R
TUMBLER HOLDER
Inside Diam. 2¾ inch
List Price $2.50

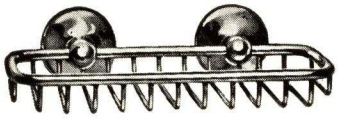
No. 59 HOOK
Height 2 in.
List Price $1.25

No. 576-R
SOAP DISH
Projection 5½ inch
Overall Length 5⅞ inch
Crystal Liner $4.00
Black Liner 4.20
Chrome Liner 5.80

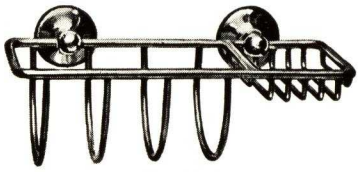
No. 46 HOOK
Height 1⅝ in.
List Price $2.10



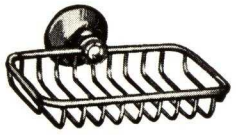
No. 581-R
SOAP DISH
Size 4⅝ x 2¾ x ⅞
List Price $3.20



No. 283-R
BRUSH AND SOAP HOLDER
Size 9 x 3½ x 1
List Price $6.00



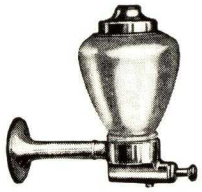
No. 921-R
COMBINATION SPONGE
AND SOAP HOLDER
Extreme Length 10½ inch
List Price $6.50



No. 282-R
SOAP HOLDER
Size 6 x 3½ x 1
List Price $3.00

No. 271-R
SOAP DISH
Size 4¾ x 3¾
Removable Drain
List Price $3.10

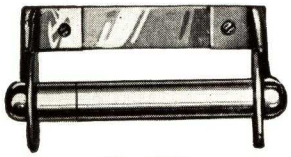
No. 66 HOOK
Height 3½ in.
List Price $2.00



No. 578-R
LIQUID SOAP DISPENSER
Height 6¼ inch
Projects from Wall 6⅜ inch
Theftproof Spring Top
List Price $8.60

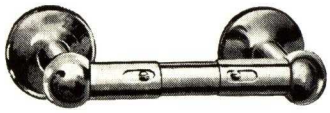
No. 64
TOWEL PIN
Projection 6½ in.
List Price $2.00

No. 259-R
SOAP DISH
List Price $4.20
Liner Furnished in Opal Also



No. 1032
PAPER HOLDER
List Price $4.90

No. 1044
PAPER HOLDER
With Restricted
Dispensing Feature
Takes Standard Roll
List Price $7.00



No. 1026
PAPER HOLDER
List Price $4.60

. . . . . For Medium Quality Work

No. 38-R—TOWEL RACK

Diameter 3/8 in.	List Price
Length 15 in.	$4.10

No. 50-R—TOWEL RACK

Diameter 3/8 in.	List Price
Length 11 in.	$4.00

No. 10-R—TOWEL RACK
Brass Metal

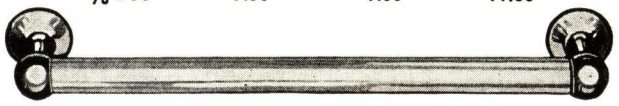
Size	List Price
5/8 x 18	$3.50
5/8 x 24	3.80
5/8 x 30	4.10
5/8 x 36	4.40

No. 55-R—TOWEL BAR
Brass Metal

Size	List Price
5/8 x 18	$4.00
5/8 x 24	4.30
5/8 x 30	4.70
5/8 x 36	5.10

No. 93-R—TOWEL BAR

Size	Brass	Crystal	Black
7/8 x 18	$6.00	$8.00	$8.60
7/8 x 24	6.50	8.60	9.60
7/8 x 30	7.00	9.20	10.60
7/8 x 36	7.50	9.80	11.60



No. 72-R—TOWEL BAR

Size	Brass	Crystal	Black
1 x 9	$4.40	....	....
1 x 12	4.60	....	....
1 x 18	5.00	$4.80	$5.20
1 x 24	5.40	5.10	5.60
1 x 30	5.80	5.40	6.00
1 x 36	6.20	5.70	6.40

No. 74-R—TOWEL BAR

Size	Brass	Crystal	Black
3/4 x 18	$4.60	$4.30	$4.50
3/4 x 24	5.00	4.50	4.80
3/4 x 30	5.40	4.70	5.10
3/4 x 36	5.80	4.90	5.40

No. 94-R—TOWEL BAR
Brass Metal, Chrom. Plated

Size	List Price
3/4 x 18	$4.10
3/4 x 24	4.50
3/4 x 30	4.90
3/4 x 36	5.50

No. 505-R—TOWEL SHELF

Length 25 in. Width 8 3/8 in. List Price $11.00

No. 58-R—GRAB BAR

Size	Brass	Crystal	Black
1 1/4 x 9	$5.30	$5.30	$6.90
1 1/4 x 12	5.70	5.90	7.80

No. 80-R—GRAB BAR

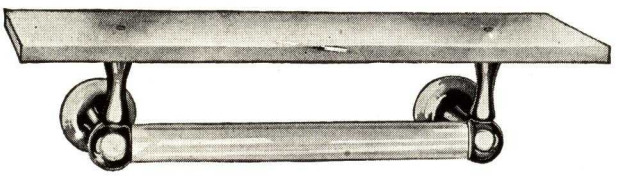
Size	Brass	Crystal	Black
1 1/2 x 9	$6.80	$7.20	$7.80
1 1/2 x 12	7.20	8.00	8.80

No. 2071-R—SHELF—Projection 5 1/2 Inch

Size	Crystal	Black	Size	Crystal	Black
5/16 x 5 x 18	$6.00	$6.50	1/2 x 5 x 18	$7.00	$7.60
5/16 x 5 x 24	6.50	7.30	1/2 x 5 x 24	7.70	8.60
5/16 x 5 x 30	7.00	8.10	1/2 x 5 x 30	8.40	9.60

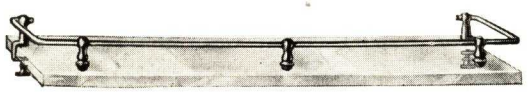
No. 2072-R—GLASS SHELF—Projection 5 3/4 Inch

Size	Crystal	Black	Size	Crystal	Black
5/16 x 5 x 18	$6.50	$7.00	1/2 x 5 x 18	$7.50	$ 8.10
5/16 x 5 x 24	7.00	7.80	1/2 x 5 x 24	8.20	9.10
5/16 x 5 x 30	7.50	8.60	1/2 x 5 x 30	8.90	10.10



No. 2041-R—GLASS SHELF—Projection 5 3/4 Inch, 1 Inch Bar

Size	Crystal	Black	Size	Crystal	Black
5/16 x 5 x 18	$ 9.50	$10.50	1/2 x 5 x 18	$10.50	$11.50
5/16 x 5 x 24	10.10	11.50	1/2 x 5 x 24	11.30	12.60
5/16 x 5 x 30	10.70	12.50	1/2 x 5 x 30	12.10	13.70



No. 2034-R—GUARD RAIL

Size	List Price
5 x 18	$3.10
5 x 24	3.30
5 x 30	3.50

THE CHARLES PARKER COMPANY

REPRESENTATIVES' LIST

ALBANY, N. Y.
H. B. Kimmey
27 Columbia St.

ATLANTA, GA.
F. Graham Williams Co.,
1690 Blvd., N. E.

BALTIMORE, MD.
Albert Gunther, Inc.
36 W. Biddle St.

BOSTON, MASS.
The Eames Co.
859 Boylston St.

BUFFALO, N. Y.
Frank I. Peterson
1 Niagara St.

CHARLOTTE, N. C.
Walter L. Hoover
938 Berkeley Ave.

CHICAGO, ILL.
A. A. Anderson
520 N. Michigan Ave.

CINCINNATI, OHIO
H. O. Anderson
126 W. Seventh St.

CLEVELAND, OHIO
Porter Bldg. Equip. Co.
6501 Euclid Ave.

COLUMBUS, OHIO
Jack Goodman
V. W. Co.
471 E. Broad St.

DETROIT, MICH.
R. T. Lyons
2457 Woodward Ave.

GRAND RAPIDS, MICH.
R. G. Kitzsteiner
64 Arthur Ave., N. E.

GREENSBORO, N. C.
Julian W. McClamroch
303 S. Davis St.

HARRISBURG, PA.
R. Baumgardner
P. O. Box 82

INDIANAPOLIS, IND.
D. K. Marburger
1819 No. Meridian

JACKSON, MISS.
Fred Thrasher
404 Tower Bldg.

JOHNSON CITY, TENN.
Eustis A. Lancaster, Jr.

KANSAS CITY, MO.
Fred B. Kennedy
1200 Oak St.
Room 507

MIAMI, FLA.
Aufford & Kelley Co.
144 N. E. 21st St.

MILFORD, CONN.
W. T. Pease
10 Thompson St.

MINNEAPOLIS, MINN.
Bartley Sales Co.
134 So. Tenth St.

NEW ORLEANS, LA.
Joseph Tanet
1564 Gen. Diaz St.

NORFOLK, VA.
Carl F. Woost
616 Connecticut Ave.

PALM BEACH, FLA.
Lanfranchi-Harvey, Inc.
338 Royal Palm Way

PHILADELPHIA, PA.
F. H. Hammett
401 N. Broad St.

PITTSBURGH, PA.
L. A. Rust
Ground Floor
Gulf Bldg.

PHOENIX, ARIZ.
The Steffey Sales Agency
830 N. Central Ave.

RICHMOND, VA.
J. S. Archer
Atlantic Life Bldg.

ROANOKE, VA.
G. Eric Sachers
P. O. Box 1885

ROCHESTER, N. Y.
S. A. Spencer
135 Spring St.

ST. LOUIS, MO.
A. F. Becker
305 Buder Bldg.

SAN FRANCISCO, CALIF.
E. L. Nonnenman
307 Minna St.

SYRACUSE, N. Y.
B. R. Johnson
145 Harding Place

UTICA, N. Y.
Charles F. Fancett
1662 Elm St.

WASHINGTON, D. C.
R. D. Stephens
1427 Eye St. N.W.

NEW YORK OFFICE
101 Park Avenue

NEW YORK DISPLAY
Architects Sample Corp.

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UNITED METAL BOX CO., INC.

"United" Steel Bathroom Cabinets and Apartment House Mail Boxes

168-186 Seventh Street, BROOKLYN, N. Y.

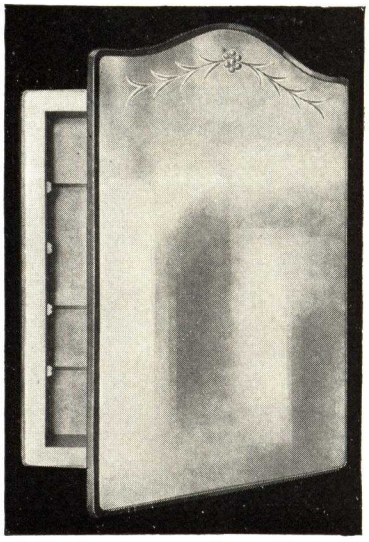
For United Venetian Blinds, Waste Receptacles, Sink and Kitchen Cabinets, see File Index

STEEL BATHROOM CABINETS

The "United" line of steel bathroom cabinets is complete. It ranges from the simple, clean-cut white enamel cabinet to the luxurious Venetian type cabinet. It includes open shelf cabinets, clothes hampers, utility cabinets, and the beautiful 3-wing vanity cabinets.

The Venetian type cabinet has been greatly improved. A one-piece channel frame completely encloses and protects the handsomely engraved mirror. This channel frame may be had in chromium or enamel finish. The door is removably mounted on the cabinet by separable hinges and has a link to limit outward swing of the door and an easy working adjustable brass catch.

United Metal Box Co., Inc., are also the manufacturers of Wall Type Clothes Hampers, Concealed Clothes Dryers, Under-sink Cabinets and Waste Receptacles. Write for catalog and specifications.



Series 7500-X

Construction Features

Indestructible—Entire cabinet is made of heavy gauge steel and protected against rusting.

Dustproof Interior—Front of cabinet is made from one piece and the door fits snugly to exclude dust and dampness.

Hinges—The cabinets are made with concealed hinges, and are specially mounted so that the door will not tear loose or sag with rough usage.

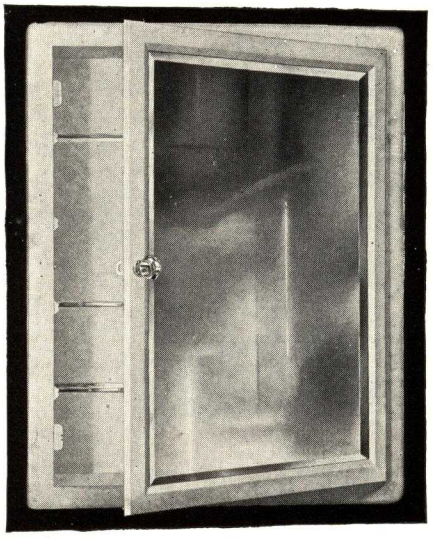
Doors—All doors are of built-up hollow steel construction specially made for rigidity without excess weight.

Adjustable Shelves—Bulb edge glass shelves are furnished with each cabinet, and are supported by permanent, attached shelf clips.

Substantial Door Knob and Catch—Door knob where used is of ornamental glass, and all doors are secured by means of concealed bullet catches.

Best Quality Plate Glass Mirrors—Mirrors are of high grade plate glass mounted on inside of door and completely encased and protected.

High Grade Enamel Finish—Cabinets are finished in a permanent smooth baked-on finish in white or colors.



Series 1500

Series 7500-X—Recess Type

The 7500-X series Venetian cabinets have handsomely engraved, plate glass mirrors of high quality with curved tops. When closed, door conceals cabinet proper and presents appearance of a mirror hung on wall. Also made with mitre border engraved on mirror instead of wreath. When mitre border is required substitute letter "M" in catalog number instead of letter "X".

Cat. No.	Wall opening, in.	Venetian mirror, in.	Glass shelves
7500XS	14½x18½	16 x22	2
7501XS	16½x20½	18 x24	2
7502X	19 x25	21⅜x29⅞	3
7503X	16½x22½	19⅛x27⅝	3

Also furnished for surface mounting.

Series 1500—Recess Type

The 1500 series fulfills the demand for a high quality, all steel, recess bathroom cabinet. The hollow steel door is hung on heavy concealed hinges. The front of the cabinet, the top and the bottom are drawn from one piece of furniture steel and the entire cabinet is finished in a durable baked-on enamel in white and colors.

Cat. No.	Wall opening, in.	Over all, in.	Beveled mirror, in.	Glass shelves
1500	14½x18½x2¾	17x21	10x14	2
*1500-A	14½x18½x2¾	17x21	12x16	2
1501	16½x20½x2¾	19x23	12x16	2
1501-A	16½x20½x2¾	19x23	14x18	2
1502-A	19 x25 x3	21x27	16x22	3

*Also made with plain crystal mirror.
Also furnished for surface mounting.

Write for Complete Catalog on "United" Bathroom Cabinets

"UNITED" APARTMENT HOUSE MAIL BOXES

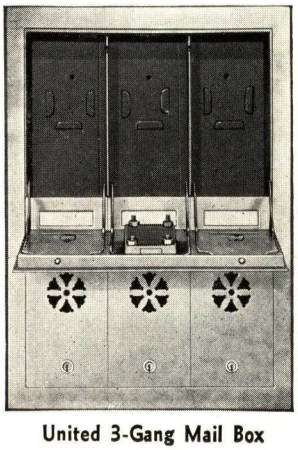
Designed to meet all requirements of the Post Office Department Order No. 3979, issued March 9, 1926.

Standard over-all height 16½ in. Made in gangs of 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12 units, each unit accommodating mail for one tenant. Each gang fitted for post office lock, furnished by United States Post Office Department, each unit with tenant lock. Gangs may be joined together to take care of any number of tenants.

"United" Mail Box units are built as one box, not assembled. Front is made of heavy, solid brass and has a drawn return flange for reinforcement. Box proper is of steel, protected against rust, and electrically welded to front. All hinges and screws concealed. Upper master door opens downward, giving access to all tenant's compartments. Lower (tenant's) door opens upward to a stationary position leaving both hands free. Opening doors can not cover tenant's name plate.

"United" Boxes are made with or without speaking tube mouthpiece and push buttons. Boxes with mouthpiece and push buttons have buttons on removable plate to allow easy access to wiring.

Write for specifications.



United 3-Gang Mail Box

A. P. W. PAPER COMPANY

Manufacturer of Onliwon* Interfolded Toilet Paper and Paper Towels

ALBANY, N. Y.

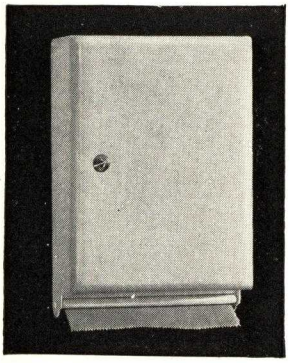
BRANCHES IN ALL PRINCIPAL CITIES

A.P.W.

TRADE MARK REGISTERED IN U.S. PATENT OFFICE

The A. P. W. Paper Company offers you a complete line of toilet paper and paper towel cabinets and fixtures to meet any specification problem relating to sanitary washroom equipment. Listed on this page are a few of the most widely specified cabinets. Our catalogue shows the complete line.

Metal Surface Type Onliwon Tissue Cabinet



Code 606 Green Enamel
Code 611 White Enamel
Code 622 Chromium Finish

This cabinet dispenses two sheets of Onliwon Tissue at a time. Protects the tissue from dust, dirt and wasteful handling. Does away with the littering of floors which is unavoidable with roll tissue service. This steel cabinet is especially desirable for schools, office buildings, factories or other buildings that have public lavatories. Carries lock and key. Indicator on front tells when to refill. Special screw holes make back adjustable to space formerly occupied by roll or fixture. Cabinet opens outward and downward for refilling.

Dimensions: 5½ in. wide, 8 in. high, 2¾ in. deep.

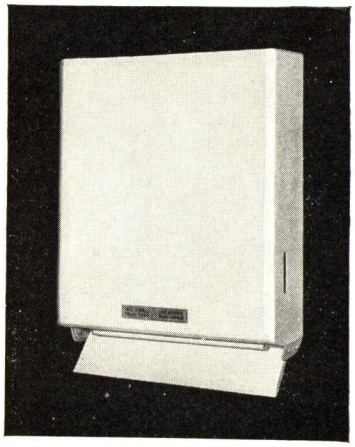
Capacity: 1250 sheets of Onliwon Toilet Tissue.

Metal Surface Type Onliwon Towel Cabinet

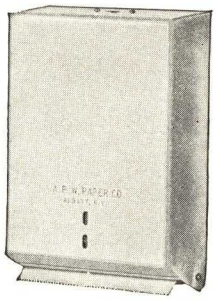
This cabinet dispenses one double folded Onliwon Towel at a time. Protects the towels from dust, dirt and wasteful handling. The double fold feature gives the towel double absorbency and strength.

This durable steel cabinet is particularly suitable for washrooms of office buildings, industrial plants, railroad stations, and other buildings that have public lavatories. Carries lock and key. Slot on side signals when to refill. Cabinet opens outward and downward for refilling. Accommodates towels 10 in. x 15 in.

Dimensions: 10¾ in. wide, 13 in. high, 2⅞ in. deep. Capacity: 150 A. P. W. Onliwon Towels.



Code 646 White Enamel Finish
Code 647 Green Enamel Finish
Code 648 Chromium Finish



Code 636 Green Enamel
Code 638 Chromium Finish

Metal Surface Single Fold Tissue Cabinet

Especially constructed for the delivery of A. P. W. Unique B Single Fold Toilet Tissue, and other toilet tissues of the single fold type. Cabinet is of steel construction and has no moving parts. Carries lock and key. Slot on front tells when to refill. Adjustable to space formerly occupied by roll or fixture. Cabinet opens outward and downward for refilling.

Dimensions: 5 in. wide, 8 in. high, 3 in. deep. Capacity: 1000 sheets of Unique B Single Fold Toilet Tissue

Code 650 White Enamel

Metal Surface Type Towel Cabinet

A remarkably durable steel cabinet, neat and compact in appearance. Especially designed to dispense A. P. W. Red Cross Office Towels. Carries lock and key. Slot on front tells when to refill. Door opens outward and downward for refilling. Accommodates towels 11x13 in.

Dimensions: 12 in. wide, 8½ in. high, 4 in. deep. Capacity: 150 Red Cross Towels

Code 642 Green Enamel
Code 643 White Enamel

Metal Surface Type Single Fold Towel Cabinet

This cabinet is made from heavy sheet steel. Very durable, contains no working parts and is fitted with lock and key. Slot on side of cabinet tells when to refill. Accommodates any standard single fold towel.

Dimensions: 7½ in. high, 14⅜ in. wide, 6 in. deep. Capacity: 150 single fold towels

*Registered United States Patent Office

When you specify an installation of Onliwon Towel or Toilet Cabinets you are sure that your client will have an absolutely sanitary, a convenient and a most economical washroom toilet and towel service. A. P. W. Onliwon is the original sanitary washroom service and is used by leading hospitals, schools and hotels throughout the country.

Besides Onliwon Toilet Tissue and Towels, the A. P. W. Paper Company also manufactures Red Cross office towels, single fold towels and roll towels, as well as single fold and roll toilet tissue. Cabinets and fixtures for all these types are available.

For catalogue giving complete information write to A. P. W. Paper Company, Albany, N. Y.

PALMER PRODUCTS, INC.

Manufacturers of Sanitary Equipment

WAUKESHA, WIS.
(Adjacent to Milwaukee)

DISTRIBUTORS IN PRINCIPAL CITIES

For Page on Soap Systems, see File Index

Products

TOILET PAPER and PAPER TOWEL FIXTURES. Also manufacturers of Floor Treatments and Maintenance Materials; Mops and Brushes; Soaps of all descriptions and Sanitary Chemicals.

Standards of Quality

Palmer Multi-Service Products are known throughout the world and are to be found in public institutions and industrial plants everywhere. Our merchandise is of a higher standard than is produced for household consumption. We cater to institutions, industrial plants and public building service requirements, therefore, our standard of quality must be higher because the service demands are greater.

All Palmer Paper Fixtures are guaranteed against defective material or poor workmanship.

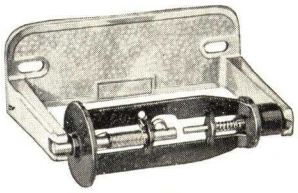
Established for a Quarter Century

Long experience in manufacturing our special lines enables us to produce the best equipment and materials that it is possible to design and manufacture. Letters of endorsement from nationally known consistent users of our equipment and products will be furnished upon request.

More Than a Million Palmer Paper Toilet Fixtures Now in Daily Use

More than a million of the Economy fixtures alone are cutting down the annual cost of toilet paper and paper towels in schools, Y. M. C. A.'s, office buildings, hotels, hospitals, department stores, City and State institutions, and especially industrial organizations such as the Studebaker plant, General Motors units, etc., where a higher order of maintenance, efficiency and economy is adhered to.

Economy Toilet Fixture



Economy Fixture
Projection from wall, 4½ ins.

Our most popular fixture. It is substantially built of heavy pressed metal, beautifully nickel or chrome plated—assembled as one complete unit (no loose spindle) and equipped with spring tension—operates much like a roller window shade. Roll of paper revolves when paper is being removed—comes to a stop, continuous pull causes paper to part at perforation, roll returns to original position for further service—delivers one or two sheets at a time.

Self-locking and foolproof—roll cannot be removed, or fixture opened, until roll is used up. Neat and attractive in appearance—it harmonizes with other lavatory equipment.

Economy Fixtures for Towels

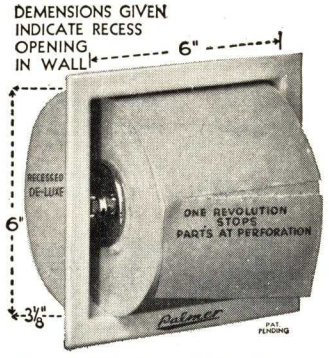
Design and general construction and operation is identical with toilet paper fixture, except that it is made from gray iron casting either nickel or chrome plated. It serves towels as economically as the toilet paper fixture serves paper.

No-Waste Toilet and Towel Fixture

Serves economically as do other fixtures. Constructed much like the De Luxe except gray iron and spindle is not attached.

Recessed De Luxe Toilet Fixture

Recessed with same economical features as all other Palmer fixtures. Spindle of same construction as De Luxe. All exposed metal parts of brass, chrome plated. Locks automatically when paper is placed—cannot open until roll is consumed. Box of cast iron with white porcelain vitreous enamel finish. ½-in. flange covers seams in wall.



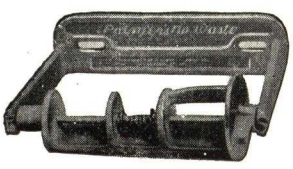
Recessed De Luxe Toilet Fixture

De Luxe Toilet Fixture

Supplies the same economical, regulated, waste-eliminating service as Economy Fixture. Operates by means of a counterweight in place of a tension spring—spindle being off balance and returning roll of paper to original position after delivering one or two sheets.

Extremely substantial, yet a graceful design, plain and in good taste, designed for better hotels, apartment houses, theaters, clubs and such places where a higher grade fixture is preferred. Made of brass—durably plated in nickel or crodon (chromium) finish.

A complete assembly (no loose spindle) is self-locking, theftproof and foolproof; and functions no matter which way paper roll is attached.



No-Waste Fixture
Projection from wall, 4½ ins.

A Few Prominent Users of Palmer Toilet Paper and Towel Fixtures

General Motors Units
Studebaker Plant
Pennsylvania Lines
Union Pacific R. R. Co.
Frigidaire Company
Delco Light Plant
International Harvester Co.

A few among thousands of institutions, factories, hotels and schools in United States, Canada and foreign countries where paper is being served economically with Palmer Fixtures.

De Luxe Fixture
Projection from wall, 4½ ins.

PULLCLEAN TOWEL CABINET CO., INC.

Manufacturers of Sanitary Towel Cabinets

TELEPHONE
Circle 7-2951-2952

430-436 West 54th Street
NEW YORK, N. Y.

PULLCLEAN SANITARY TOWEL CABINET

A Continuous Cloth Towel System

The Pullclean Sanitary Towel Cabinet dispenses towel service with economy and efficiency, substituting for the unsanitary roller towel a clean towel for each user. It has the approval of physicians, health officials and sanitary experts and meets the requirements of offices, factories, stores, hotels, hospitals, restaurants, schools, theaters, churches, railroad coaches, steamships and, in fact, wherever numbers of persons require sanitary yet economical towel service.

Description

Cabinet—A metal case of attractive design, highly finished in white enamel with lettering and ornamentation in red and gold.

Working Mechanism—A simple arrangement of rollers operating in unison as the towel is pulled through. Strongly built of the best materials for long service. An upper compartment contains the roll of clean towel and a lower compartment, *entirely separate,* receives the soiled towel as used.

Towel—A 25-yd. length of fabric specially designed for the Pullclean Cabinet and wound in a roll for dispensing. It provides from 75 to 135 wipes according to the type of cabinet and length of loop which hangs out of the cabinet for use. The length of this loop is determined at the time the towel is loaded into the cabinet. No part of the clean ever comes in contact with the soiled, and each user pulls out an absolutely unhandled portion. Once carried into the lower or soiled towel compartment *it cannot be withdrawn for reuse.*

Advantages

(1) Always clean and sanitary. Always in place and ready for use. It protects the user by taking in the used towel as fast as the clean is pulled out. (2) Cannot be used as a dustrag or shoe-polisher. (3) Receives normal usage. Does not get badly soiled. Wears longer—fully 50% longer than most towels. (4) Towel loss eliminated—the roll is locked in the case. (5) No counting and handling of dozens of small towels. (6) Economical. One towel gives 100 wipes, with stop 135. Cheaper towel service even than paper, yet there are none of the disadvantages incident to the use of paper—no litter, no stoppage of waste pipes, no fire hazard, no complaints of employes because of half-drying and chapped skin. Cheap to launder—usual charge is 15 cents. (7) Satisfies every user as no substitute for cloth can. More satisfactory than the individual towel and more economical. (8) Replacing towel simple—only a moment's operation.

Made in Two Types

Pullclean Cabinets are made in two types:

Type No. 1—A free-working model for office and general use. It permits a full length pull of the towel loop and provides approximately 75 wipes.

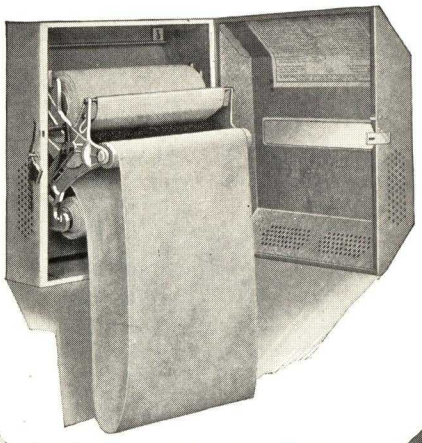
Type No. 2—This type is equipped with push-button stop-release device and is designed to meet the needs of concerns wishing to place limitation on towel usage.

At each release of the mechanism, 6½ inches of clean towel may be pulled out. It is a great saver of the towel and discourages waste. Affords approximately 135 wipes.

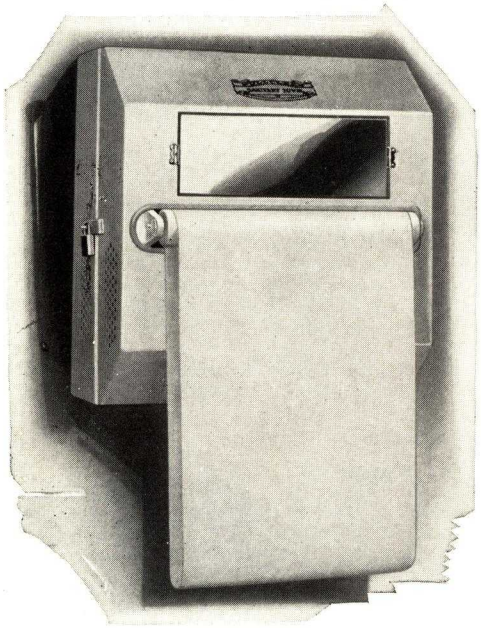
Prices and Towel Service Rates

All Pullclean Cabinets for shipment are carefully packed in special cartons. Small shipments are made by express unless otherwise requested. Towel weighs about 3½ lbs. and can be sent via parcel post. Prices quoted f.o.b. New York.

TRADE MARK PULLCLEAN REG. U. S. PAT. OFF.



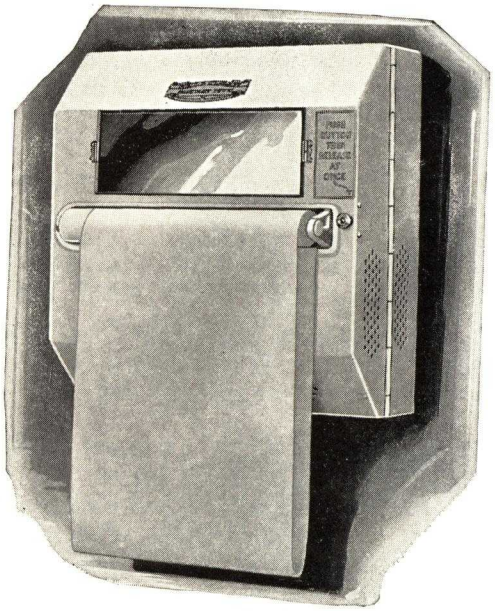
Inside View of Pullclean Cabinet
Showing the towel in place



Type No. 1
Provides approximately 75 wipes

A Few Installations

D. Appleton-Century Co., Inc.
Arbuckle Brothers
L. Bamberger & Co.
Bank of the Manhattan Co.
Best & Co.
Breyer's Ice Cream Co., Inc.
Chase National Bank
Cities Service Co.
Crowell Publishing Co.
Equitable Life Assurance Society
Fifth Avenue Bank
Forbes & Wallace
General Outdoor Advertising Co.
Harris, Upham & Co.
Hudson River Day Line
Cyrus J. Lawrence & Sons
Benj. Moore & Co.
New York Times
New York World-Telegram
Presbyterian Building
Presbyterian Hospital
Rosoff's Restaurant
Saks & Company
Franklin Simon & Co.
Stern Bros.
Temple Emanu-El
Worthington Pump & Machinery Co.



Type No. 2
Provides approximately 135 wipes

SCOTT PAPER COMPANY

Tissue Towels, Toilet Tissues, Towel Cabinets and Toilet Tissue Fixtures

CHESTER, PA.

SALES OFFICES

ATLANTA, GA., 1011 Rhodes-Haverty Building
BALTIMORE, MD., 308 Hearst Tower Building
BOSTON, MASS., 89 State Street
BUFFALO, N. Y., 114 Erie Co. Bank Building
CHICAGO, ILL., 1609 Tribune Tower
CLEVELAND, OHIO, 855 Leader Building
DALLAS, TEX., 808 Santa Fe Building
DETROIT, MICH., 2814 Union Guardian Building
LOS ANGELES, CALIF., 923 E. Third Street
NEW YORK, N. Y., 30 Church Street
PHILADELPHIA, PA., 912 Otis Building
PITTSBURGH, PA., 709 Grant Building
ST. LOUIS, MO., 1104 Chemical Building
SAN FRANCISCO, CALIF., 2050 Bryant Street
SEATTLE, WASH., 505 Terminal Sales Building

Customers, employees and all users of washrooms look for the same sanitary conveniences they enjoy at home. A clean, efficient washroom represents a small but important building investment in better employee morale, better customer relations.

As the world's foremost supplier of quality tissue towel and toilet-tissue service, SCOTT PAPER COMPANY has developed attractive, efficient fixtures adaptable to any type of building installation.

By specifying Scott towels and tissues and Scott fixtures you will provide your client's building with the best available washroom service.

TISSUE TOWELS

ScotTissue and Waldorf Towels are used in hundreds of office buildings, schools, banks, department stores, clubs throughout America for these reasons:

(1) They dry thoroughly and are pleasant to use.
(2) Their comfort and quality build employee and customer good will.
(3) They help maintain cleanliness and sanitation.
(4) They provide an efficient, convenient towel service.
(5) They cost less per user, due to their balance of softness, strength and absorbency.

TOILET TISSUE

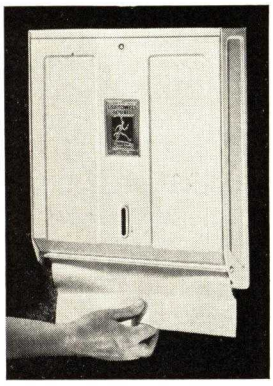
ScotTissue Service Roll is the popular, luxury-texture ScotTissue Toilet Tissue packed for business and industrial use. The wrapper, unessential to a product not intended for retail sale, has been replaced by a band at considerable saving in cost of manufacture. Customers, tenants and employees, a large majority of whom use ScotTissue in their homes, will appreciate finding this same healthful service in office buildings, schools, hospitals, hotels, clubs—everywhere that comfort and protection are important considerations.

TOWEL CABINETS AND TOILET TISSUE FIXTURE

There is a Scott Fixture especially designed for every need, whether it be a large or small installation, a public or private service. These fixtures are standard equipment for many of the country's largest industrial and institutional users.

No. 05 Cabinet

ScotTissue and Waldorf Towels are kept fresh and safe from dirt in this dustproof, steel wall cabinet. It holds a liberal supply of 250 individual towels always clean and ready for use. The construction is strong and simple, with no mechanism to get out of order. For renewal, the cabinet unlocks at the top and opens out. Made of pressed steel and beautifully finished in white, black or dark green enamel. It can be applied to wall with bolts, screws or our special adhesive cement which will not mar the surface.

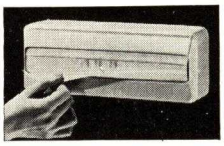


No. 066 Fixture

The patented ScotTissue Toilet Tissue holder with waste-preventing lock and tension control. Hinged on one side for easy renewals. Finished in nickel or chrome plate. The most efficient fixture of this type available. Applied to wall with bolts, screws or our special adhesive cement.

No. 057 Towel Holder

(Pullman Type)



A compact dispenser holding a supply of 50 towels in minimum space. Finished in white, green or bronze enamel that will not chip or scar. Tension plate presses against the towels from the back and keeps one always in position to be released by a slight pull. Applied to wall in same manner as the No. 05 Cabinet.

WASHROOM ADVISORY SERVICE

"What is the proper number of towel cabinets for a washroom of given size?" "Where should they be located?" "How many towel receptacles should be supplied?" "Where should they be located?" "At what height from the floor should toilet-tissue fixtures be placed to render most efficient service?"

The Scott representative is able to answer these and other questions. He brings a specialist's point of view into your washroom problems. This service is at the command of architects at any time without cost or obligation.

DEPENDABLE SINCE 1897

THE CHICAGO HARDWARE FOUNDRY COMPANY

SANI-DRI DIVISION

Producers of High Grade Iron, Ni-Resist, Semi-Steel, Brass, Bronze, Aluminum and Alloy Castings; Machine Work; Plating; Porcelain Enameling; "Sani" Food and Drink Equipment; "Favorite" and "Saniware" Cookware and Electric Hand Driers

NORTH CHICAGO, ILLINOIS

SALES REPRESENTATIVES IN PRINCIPAL CITIES OF THE UNITED STATES, CANADA AND MEXICO

LOCAL REPRESENTATIVE

PRODUCT—SANI-DRI

A high grade electric hand and hair drier. Hand driers for use in all types of group washrooms. Advantages: (a) Eliminates metal cabinets, waste containers, soiled towel litter. (b) Obviates necessity of marring marble and tile walls for mounting of towel cabinets. (c) Removes floor obstructions, thereby conserving floor space. (d) Insures attractively clean washrooms. (e) Provides an automatic, sanitary and dependable drying service at savings of 85 to 90% over towels.

Hair Driers for quick drying after the swim or shower. Save time, prevent colds. Widely used in schools, clubs, recreation centers, Y. M. and Y. W. C. A.'s.

THE COMPANY

With the exception of the motor and switch, the entire Sani-Dri equipment is made and finished in our own plant under rigid supervision. All parts are unconditionally guaranteed against defective material and workmanship for a period of one year.

ADAPTABILITY

This new "SR-W" (Semi-Recess Wall) model Sani-Dri is designed for installation in any type of wall construction finishing 4 in. in thickness or over.

CONSTRUCTION

Wall Box: Solid, one piece, cast iron with wide facing flange for easy, accurate mounting *during course of wall construction;* Japan lacquered to prevent rusting.

Fan Housing: A rigid, one-piece casting designed for quick, convenient mounting after completion of finished walls.

Face Plate: Finished in highest grade dry process porcelain enamel of any standard color. Heavy grey iron casting, in modernistic design. Special colors to match any tile, glass or marble at slight extra cost.

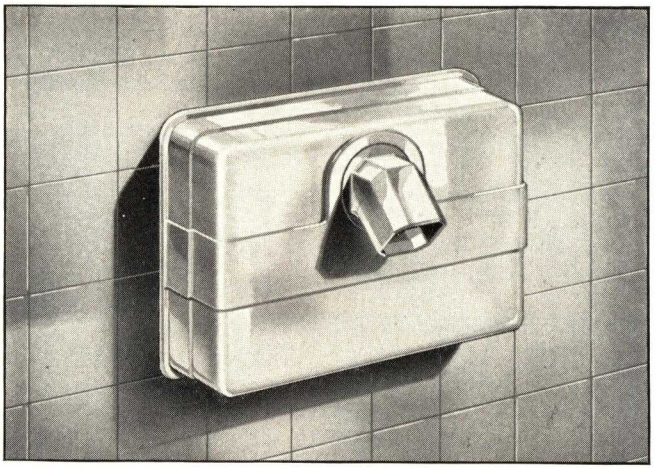
Trimmings: All trimmings are of heavy brass, chromium plated.

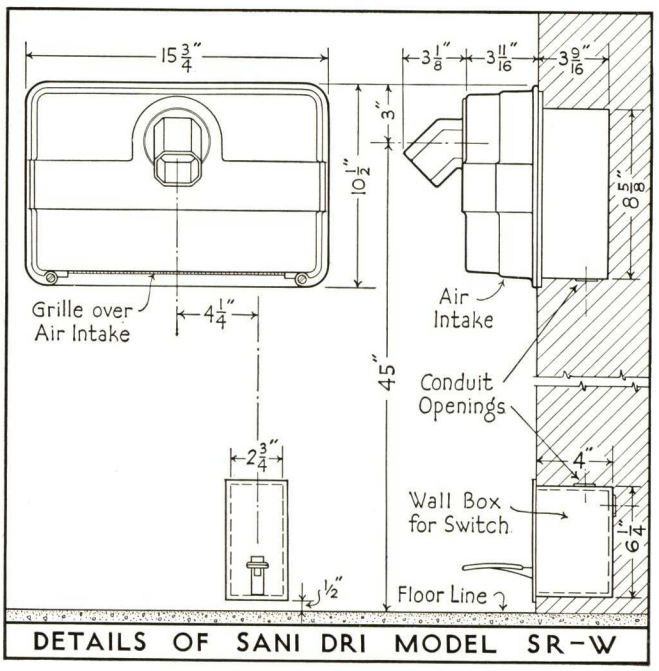
Fan: High grade aluminum fan especially designed and constructed for delivery of large air volume at moderate speed.

Motor: Equipped with especially designed quiet operating Westinghouse or General Electric motor.

Electrical Specifications: Standard—13.5 amps. on 110 volts—Motor, 1.5 amps; heater, 12 amps. (16 amp. heater supplied on request, in hand driers only. Also in 220 volts.)

Switch: A 30 amp. Hart and Hegeman foot pedal control switch, operating in heavy cast-iron box mounted in wall, with pedal elevated slightly above floor line, thus eliminating possible floor obstruction.





DETAILS OF SANI DRI MODEL SR-W

BOBRICK MANUFACTURING CORPORATION

ESTABLISHED 32 YEARS

Manufacturers of Liquid, Lather and Powdered Soap Dispensers

215 Fourth Avenue
NEW YORK, N. Y.

117 South Garey Street
LOS ANGELES, CALIF.

The Sop-O-Zon line is the result of 32 years of specializing in the development and manufacture of one product. Immediate delivery from the stocks of over 300 distributors in the U. S. and Canada.

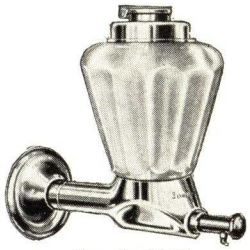
Sop-O-Zon

USED BY MILLIONS SINCE 1906

Sop-O-Zon dispensers combine beauty of design, simplicity of installation and long trouble-free service. Time tested by millions of users. A model for every type installation. Write for catalog illustrating 31 models.

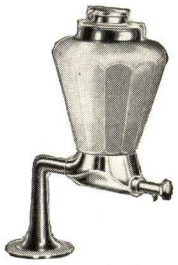
INDIVIDUAL TYPE LIQUID SOAP DISPENSERS

Chromium Plated



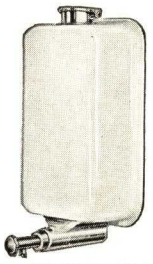
No. 7—$5.50

One-piece solid bronze body and bracket. Streamline design. Hinged lock top cemented to clear, practically unbreakable glass globe. Valve parts nickel silver and stainless steel. Theft-proof—screws or toggles concealed. Dispenses soap in palm of hand. Colored glass globes or metal globes at slightly higher prices.



No. 8—$6.50

Heavy pressed steel body with white vitreous porcelain enamel finish like washbasins, easy to clean. Hinged filler cap locks. Valve body bronze. Valve parts stainless steel and nickel silver. Screws concealed. Theft-proof—made in two sizes. Fawn, green or black finish slightly extra. The heavy duty dispenser.



No. 10, Pint—$5.50
No. 12, Quart—$6.00

No. 15—$3.90

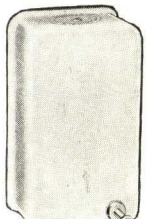
No. 15—We claim this the best push-up dispenser on the market. Body and valve solid bronze. Delivers measured quantity of soap at each operation. May also be had with slab bracket and metal globes.

No. 829—Often called the Pullman dispenser. Can be installed through the faucet hole of any basin. Valve casting nickel silver. Fills from top by unscrewing push button. Can be supplied with shank to fit basins up to 4½ in. thick. Also with metal jars.

No. 829—$7.20

Dispenses a creamy lather with any liquid soap. Cannot possibly leak because liquid will not flow up hill. Moving parts made of stainless steel and monel. Filler cap is chained and unlocks with key furnished. Theft-proof installation. The soap supply is always visible, yet the glass globe is protected by the metal case. Chromium plated.

Lathurn, $6.50

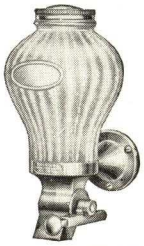


No. 31—$5.50

POWDERED SOAP DISPENSERS

Chromium Plated

The operating mechanism of both these powdered soap dispensers agitates the soap and delivers a measured quantity at each press of the plunger. No. 25 is the conventional glass jar type. No. 31 is made from heavy pressed steel with white vitreous enamel finish. Theft-proof installation, all parts enclosed and locked.



No. 25—$3.50

HOSPITAL DISPENSERS

Chromium Plated

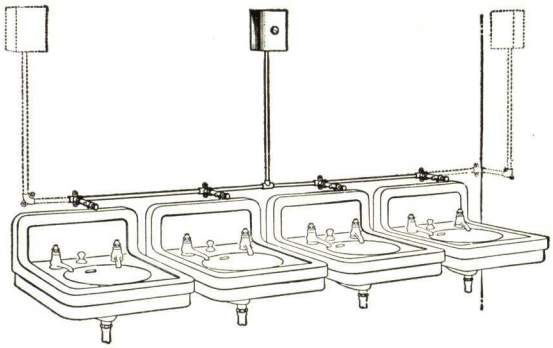
The No. 813 shown is foot operated. All parts made from solid bronze. We also manufacture knee operated and individual type hospital dispensers.

Write for literature.

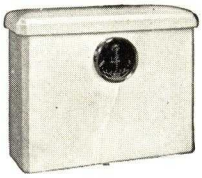
No. 813—$20.00
Foot Pedal

GRAVITY FEED LIQUID SOAP SYSTEMS

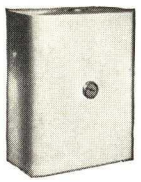
Valves and Fittings Chromium Plated



Bobrick's gravity feed systems are the original. All valves made from solid bronze with nickel silver and stainless steel parts. Tanks and fittings for every type of installation. Write for special literature.



China Tanks
831—1 gal. —$15.00
832—2 gals.— 19.50
833—5 gals.— 24.50



Heavy Iron—Soapproof Lacquer Finish
906—1 gal. —$ 7.50
907—2½ gals.— 9.50
908—5 gals.— 11.50

Factory Type
920—1 gal. —$5.00
901—3 gals.— 7.50
902—5 gals.— 9.80

Pullman
C-866—$6.00

C-860—$3.50
Dispenses Liquid Soap

Lathurvalv—$3.50
Dispenses Creamy Lather

C-863—$3.50
For Showers

86-92
With Pop Up Waste
$16.50

COLGATE-PALMOLIVE-PEET COMPANY

105 Hudson Street
JERSEY CITY, N. J.

PALMOLIVE "MEASURED SOAP" DISPENSER

This soap dispensing system, developed by COLGATE PALMOLIVE-PEET COMPANY, combines a scientifically engineered dispenser and a fine quality toilet soap, which reduces washing costs materially and provides other advantages and economies.

Used together, the Palmolive Dispenser and Soap enable the architect to provide his clients with—

(1) A more satisfactory washing service—a generous service but one always under control.
(2) Lower annual soap costs.
(3) A higher quality soap.
(4) A minimum of replacements and repairs.
(5) Improved appearance of washroom with more attractive fixtures.

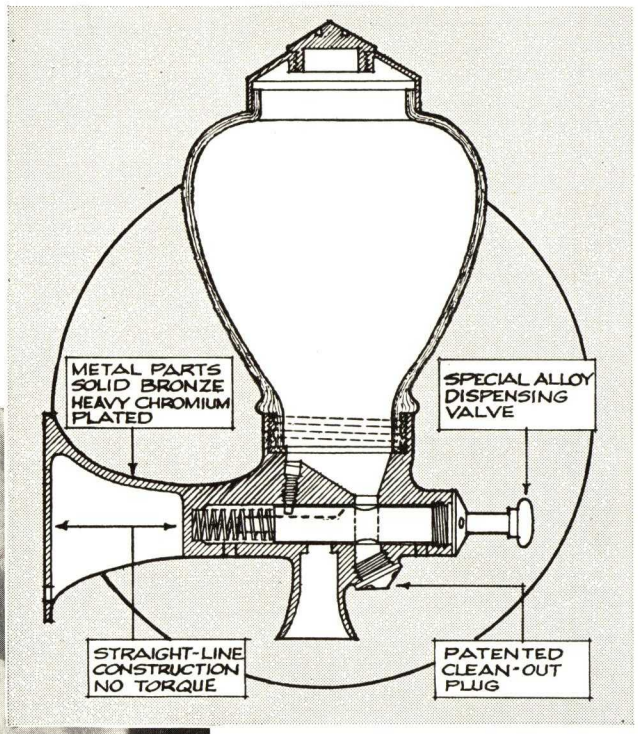
Advantages and Economies

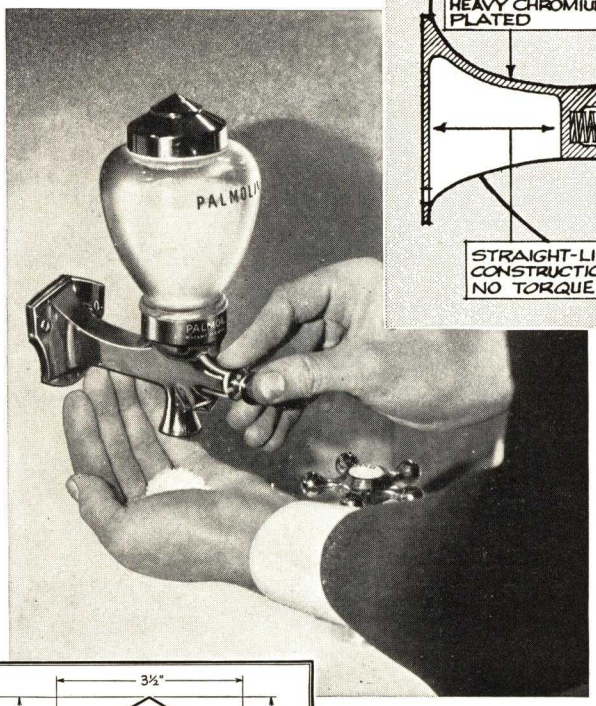
In its present form, the Palmolive Dispenser represents years of actual experimentation and service. The many improvements made during this time have brought the dispenser as close to obsolute perfection as possible.

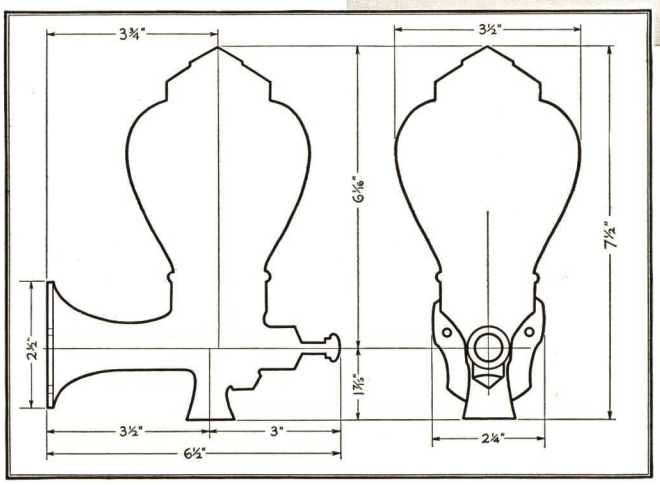
Corrosion and Wear Minimized — The body and bracket including the metal parts, are machined from 85% copper-bearing bronze, chromium plated over heavy nickel plating, reduce corrosion and wear to a minimum.

Leakage of Free Drainage Eliminated—There is no direct passage from the soap reservoir for the soap to pour out or leak. The soap chamber in the dispensing valve is located forward of the dispensing outlet. When the plunger is pushed in, only a "measured" amount of soap is released to the user's hands. To get more, the plunger must be used again.

No Torque or Twist—The straight-line construction of the Palmolive Dispenser eliminates torsion. The force applied to the dispensing valve is directed to the center of the wall bracket.







Attractive in Appearance—Modern in design, the Palmolive Dispenser will help to improve the appearance of practically every washroom and it is readily adapted to most interior designs.

Easy to Refill — Screw-Cap on reservoir prevents tampering with soap content, but permits easy access for refilling purposes with the use of a special wrench furnished with each unit.

Low in Maintenance Cost—The only maintenance cost is that of occasional refilling and ordinary cleaning. With only one moving part, repairs and replacements are practically eliminated.

A patented cleanout plug* permits easy access to soap-measuring chamber and to base of soap reservoir, without removing the dispenser from the wall.

Economical—Piping is eliminated with Palmolive Dispensers, and in operation the Palmolive method *provides* 100 *washes for one cent.*

Soap for Palmolive Dispensers

A special dry free-flowing form of Palmolive Soap is recommended for Palmolive Dispensers — Palmolive Soap for dispensing machines differs from other dispensing soaps. It flows better—gives a quick, cleansing lather in ordinary temperature water. It is identical in quality to the world-famous Palmolive Toilet Soap. And customers have found, by actual check, that where they formerly used 10 lbs. of ordinary dispensing soap, 6 lbs. of Palmolive with the Palmolive Dispenser gives just as many washes.

*U. S. Patent No. 1904756.

Condensed Specifications and Installation Details given in A-I-A File Folder Free on Request

PALMER PRODUCTS, INC.

Manufacturers of Soap Systems
WAUKESHA, WIS.
(Adjacent to Milwaukee)
DISTRIBUTORS IN ALL PRINCIPAL CITIES
For Page on Toilet Paper and Towel Fixtures, see File Index

Reputation

Palmer Multi-Service Products are known throughout the world and are to be found in public institutions and industrial plants everywhere. Palmer equipment stands up. Thousands of installations are operating satisfactorily after years of hard usage. A quarter century of manufacturing experience enables us to produce the best equipment and materials in our line that it is possible to design and manufacture.

Palmer MULTI-SERVICE PRODUCTS

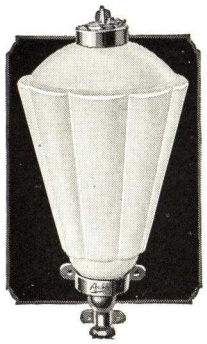
NOTE

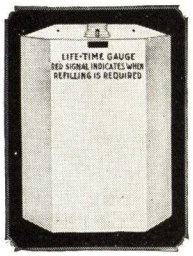
In process of production we have soap sudsing equipment in both individual dispensers and tank systems that will be ready for market after the first of the year.

Standards of Quality

Our merchandise is of a higher standard than is produced for household consumption. We cater to institutions, industrial plants and public building requirements — therefore, our standard of quality must be higher, because the service demands are greater. *All Palmer equipment is guaranteed against defective material or poor workmanship.*

PALMER SOAP SYSTEMS FOR NEW AND MODERNIZED BUILDINGS





Tank Systems

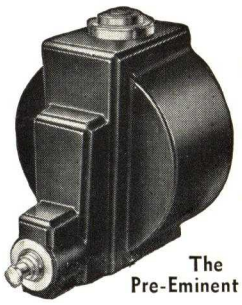
All modern buildings where there are several units of washbasins in the same room will find a tank system more advantageous, neater and it does not detract so much from the room as individual dispensers.

China Glass Tank—The finest and most permanent receptacle obtainable — brass fittings chrome or nickel plated—¼-in. thick white china glass. Equipped with a lifetime gauge to indicate when soap is needed. Remains permanently attractive—capacity 1½ gal.—will serve up to six valves efficiently—two receptacles on a system with a greater number of valves. ⅜-in. fittings.

Metal Tank—Palmer Metal Tanks are designed to appear as flat against the wall as possible—constructed from heavy terne plate (rustproof), finished with white lacquer. Furnished in 1, 3 and 5-gal. capacities—larger sizes or special shapes made on order. Monel metal tanks made in the same design as above or special shapes on order. ⅜-in. fittings.

⅜-in. pipe sizes are standard with soap dispensing equipment. Black iron pipe for concealed installations, nickel or chrome pipe for exposed installations.

In Specifying—Tank Systems should be specified by architects in new buildings, and pipes installed with other plumbing. Complete systems can be supplied for a reservoir at the highest point in the building.



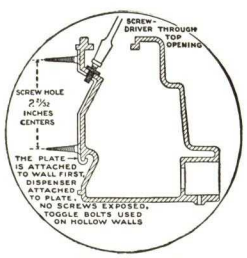
The Pre-Eminent

Individual Dispensers

The Pre-Eminent—An individual dispenser adaptable for use in hotels and clubs where design and color in washrooms have been given special consideration by architects. Standard colors: White, Black, Apple Green, Fawn, Orchid.

The Pre-Eminent is a solid casting with vitreous enamel like a bathtub, *as durable and lasting as other plumbing equipment.* Permanently and efficiently attached to wall as shown at left. Unbreakable key lock, large opening at top, opened with key. Chrome plated metal parts. Vertical dimensions, 5¾ in.; over-all projection from wall, 5⅝ in.

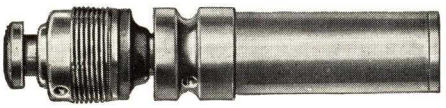
Replaceable valve unit enables springs or gaskets to be easily replaced after years of service. Capacity, 50% larger than ordinary dispensers, 22 oz. or 1200 washes when a good grade of soap is used.



Attachment
Note concealed attachment

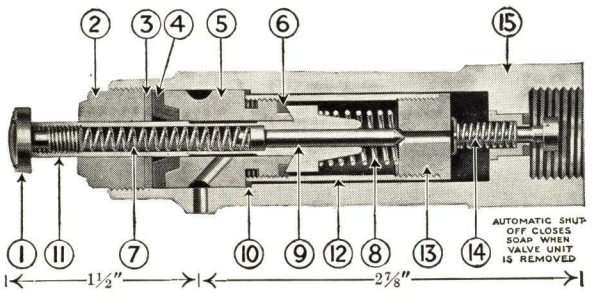
The Tilting-Type—Unique in design and construction. Remains attractively clean and sanitary. No metal bands, cracks or crevices to hold secretions of soap and soil. Metal parts chrome plated brass. Bowls—black, opal or clear glass.

Features of Palmer Replacement Valve Unit—for Tank Systems and Pre-Eminent Individual Dispenser



Palmer Replaceable Valve Unit

Unit does not permit a continuous flow of soap. A uniform charge of soap is ejected after each complete operation of the plunger (i.e., push in and release). Needle valve withstands pressure when tanks are placed high above valves, frequently many floors above or even in the penthouse—or when soap is distributed under air pressure

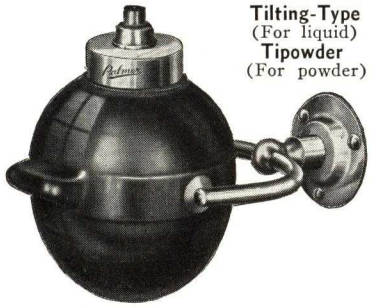


The Parts

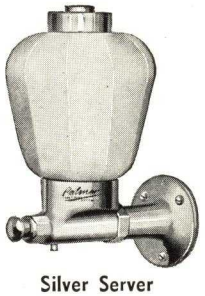
Note: All parts of valve unit are replaceable—for repairs or cleaning—all screwed together—no special tools necessary.

1. Push button
2. Front bushing
3. Gasket washer
4. Plunger gasket
5. Spacer bushing
6. Valve gasket
7. Needle valve spring
8. Plunger spring
9. Needle valve
10. Shoulder washer
11. Plunger
12. Unit shell
13. Rear bushing
14. Automatic shut-off
15. Valve body, into which valve unit is screwed

Automatic Shut-off—Built as part of complete valve—permits removing of valve unit for repairs or cleaning, yet automatically closes off soap at this point without interfering with other valves on same system.



Tilting-Type
(For liquid)
Tipowder
(For powder)



Silver Server

The Tipowder—A practical and efficient dispenser of powdered soap. Design similar to Tilting-Type. No springs, agitator or gears. Metal parts chrome plated brass. Bowls—black, opal or clear glass.

The Silver Server—Although this is the only nickel silver dispenser on the market, its price is no higher than other good dispensers. Replaceable valve is also of nickel silver. No plating to wear off—non-corrosive, non-tarnishing. Large opening at top has key lock. Supplied with opal glass or clear glass bowl.

THE IMPERIAL BRASS MANUFACTURING CO.

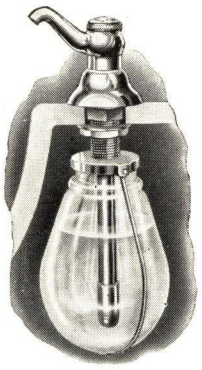
Watrous Liquid Soap Dispensers

1200 West Harrison Street, CHICAGO, ILLINOIS

For Watrous Flush Valves and Imperial "Floatless" Automatic Electric Sump Pumps, see Our Separate Catalogs

The Watrous line of liquid soap dispensers is complete—from individual portable units to equipment for the largest group installation. All deliver a measured quantity of soap and are drip and leak proof, resulting in sizeable economies.

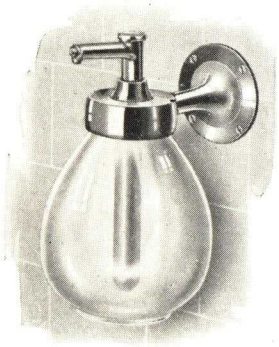
Materials and Finish—All fixtures are made of the best materials, handsomely finished in chromium plate, non-corrosive and positive in action. The modern fixture designs meet the requirements of forward-looking architects.



M-801

M-830

M-807



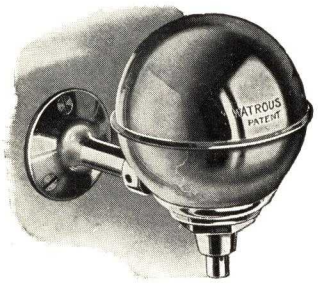
M-826

M-801—Plunger Type—Fits lavatory tops up to 1¼ in. thick. Also available up to 4½ in. To refill, unscrew push-button cap. Metal container available at extra cost.

M-830—Plunger Type—Similar to M-801 except for modern style Art Crodon design. The two types of glass containers shown can be furnished on either dispenser.

M-807—Horizontal Type—For attachment to wall, push-button action. Refilled through cap. Measured quantity of soap delivered. Cannot be made to flow.

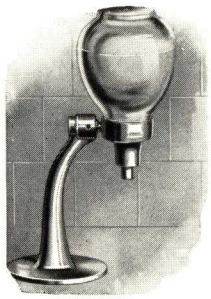
M-826—Upright Type—Popular, low-priced model; attached to wall. Unscrew jar to refill. Deliver soap by pressing button on top of container. Non-drip.



M-800

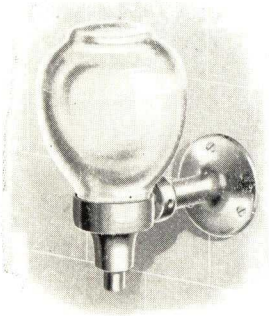
M-800—For attachment to wall or lavatory back. Metal container. Upward pressure delivers measured amount of soap. Invert container to refill. Spring lock keeps unit in operative position.

M-816—For attachment to lavatory top. Glass container. Invert container to refill. Germ and dust proof. No soap can escape except through actual operation of plunger.



M-816

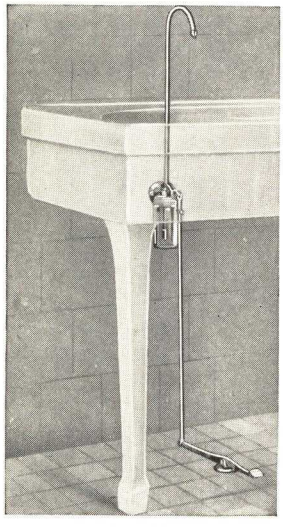
M-815—For attachment to wall or back of lavatory. Glass container. Invert container to refill. Measured quantity of soap delivered with each operation of plunger.



M-815

HOSPITAL TYPES

M-813 — Foot operated, sanitary. Bracket support, integral spout, fastened to wall by screws. With wall lavatories, place support at one side, spout turned to come over lavatory. Adjustable foot pedal rod.



M-813

M-814

M-814 — Knee operated. Wall bracket screws onto wall, in same location for either pedestal or wall lavatories. Spout attached through either faucet hole or through waste knob hole, where chain and plug are used.

PORTABLE DISPENSERS

M-836—Table Type. Glass container, refilled by unscrewing push button. Bronze base, chromium plated.

M-1030—Floor Type, foot operated. Horizontal swiveling spouts, which telescope with a 4-in. range. Maximum spread of spouts: open, 27¼ in.; closed 19¼ in.

At Right:
M-1030
Portable Floor Type

M-836

WATROUS GRAVITY LIQUID SOAP DISPENSING SYSTEMS

A Complete Line

THE IMPERIAL BRASS MANUFACTURING CO. offers a complete line of Watrous equipment of gravity liquid soap dispensers. A selection of valves and fittings allow considerable choice in the appearance of the finished installation. A variety of supply tanks (illustrated) is offered in several types and finishes. The diagram at bottom of this page is a typical installation, included for convenience in specifying piping and fittings.

Features

There is no wastage in a Watrous gravity system. The economies resulting from use of the equipment, which is drip and leak proof, are an important consideration in large-scale installations. The cleanliness and handiness of liquid soap systems are other outstanding advantages.

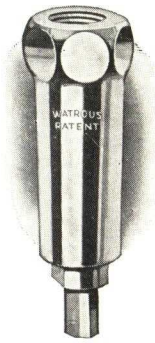
Adaptability

A complete gravity system can be installed either with exposed piping, as shown in diagram, or with all piping concealed. The systems are especially adapted to washrooms in clubs, schools, hotels, offices, and anywhere that a large group of persons will use the facilities.

Easy to Service

Watrous Gravity Liquid Soap Dispensing Systems require minimum attention. As long as there is soap in the supply tank, the system takes care of itself.

VALVES AND DISPENSERS



C-862

C-863

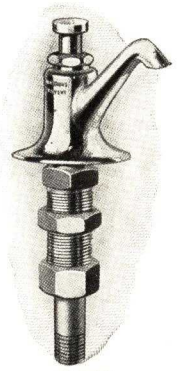
C-862 — Vertical Liquid Soap Valve. Especially adapted for use in industrial plants over wash sinks, lavatories, etc. Threaded ⅜ in. iron pipe to fit standard fittings.

C-863 — Elbow Liquid Soap Valve. Particularly suited for shower stalls, industrial plants, etc. A push on the plunger delivers a measured quantity of soap. Threaded for ⅜ in. iron pipe.

C-866—Dispenser for attachment to top of lavatory. The shank is constructed for 1½ in. thickness of lavatory and to fit 1¼ in. faucet hole. Longer shanks specially furnished. Shank has ¼ in. iron pipe coupling nipple.

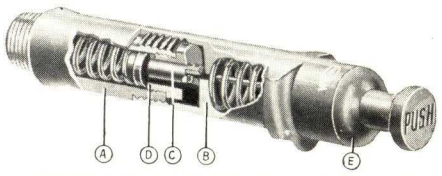
M-817 — This modern styled dispenser is similar to C-866 except it is in Art Crodon style.

C-860—Horizontal Liquid Soap Valve. Threaded to ⅜ in. iron pipe size to fit our standard wall fittings.



C-866

M-817



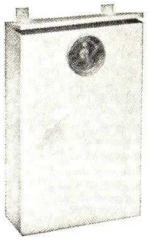
M-865—Horizontal Valve with Cut-off

M-865—Combination valve and cut-off, stops soap flow when valve is removed. A, cut-off device. B presses on stem C, holding valve D open so soap flows freely into valve. When B is removed from A, the stem advances and cuts off valve's seat at D, automatically sealing the pipe line.

C-860

TANKS FOR GRAVITY SYSTEMS

NOTE: *We do not recommend a 1-gal. tank for more than four valves.*



C-903

C-903—Made of Russianized iron and with a white enameled finish, this tank has 2½ gal. capacity. Welded seams, hinged top, wide opening for easy filling. Calibrated gauge indicates contents in quarts. Tapped for ⅜ in. iron pipe.

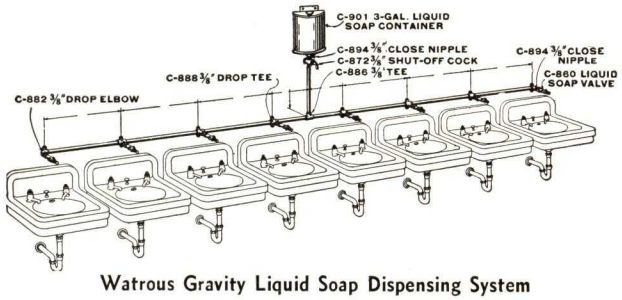
M-832—This vitreous China tank prevents corrosion from chemical action of soap. Easy to keep clean. Gauge on front indicates contents in quarts. Tapped for ⅜ in. pipe. Three sizes—5 qts., 2 gals., 5 gals.

C-870—One gallon capacity glass jar. Bracket of galvanized cast iron, tapped ⅜ in. iron pipe thread. Special attachment for clamping to water pipes furnished at additional cost.

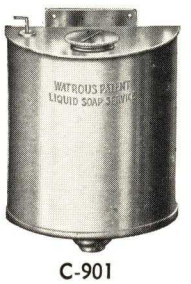
C-901—Three sizes—1, 3, and 5 gals. Gauge on top drops when tank is three-quarters empty. Made of black iron, welded seams, white enamel finish, for factory use. Tapped ⅜ in. iron pipe. Stainless steel tanks available at extra cost.

C-870

M-832



Watrous Gravity Liquid Soap Dispensing System



C-901

THE PROCTER & GAMBLE CO.

Ivory Soap Dispensers

CINCINNATI, OHIO

IVORY SOAP DISPENSERS

For Public Washroom Installation Only

The Ivory Soap Dispenser is designed to meet the requirements of public washroom installations in office buildings, hotels, industrial plants, hospitals, clubs, theatres and restaurants. (Not sold for use in residences.)

Construction—

Gracefully designed. Octagonal bowl of heavy frosted glass holds flaked or granulated Ivory Soap. All metal parts chromium plated. Will not rust, tarnish or corrode. Virtually airtight and moistureproof. (Dimensions indicated on sketch below.)

Operation—

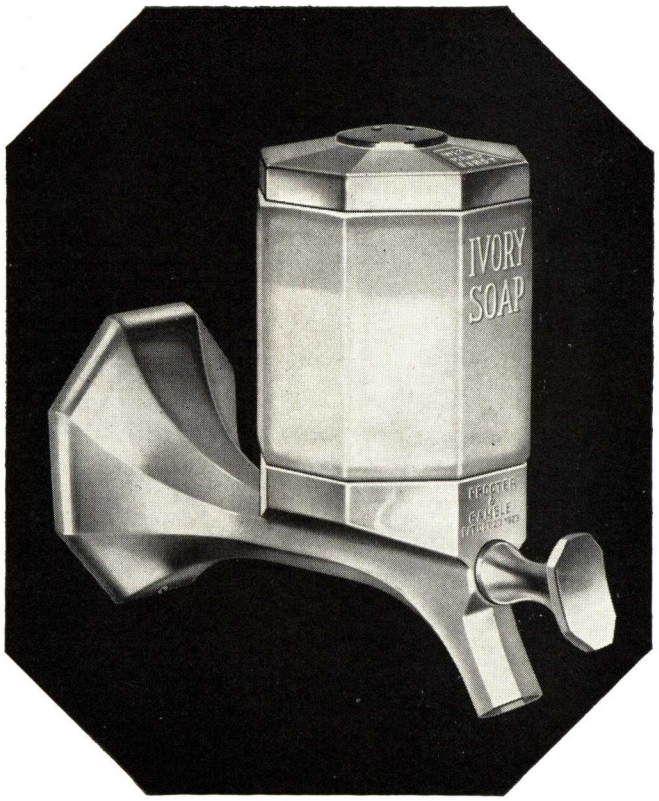
Dispenser self-contained. Foolproof. Delivers measured amount of Ivory Soap with each push of the plunger. Dispenser cannot be emptied by holding in plunger. Unlike ordinary dispensers, the Ivory Dispenser has no complicated piping system to clog, leak or get out of order.

Installation—

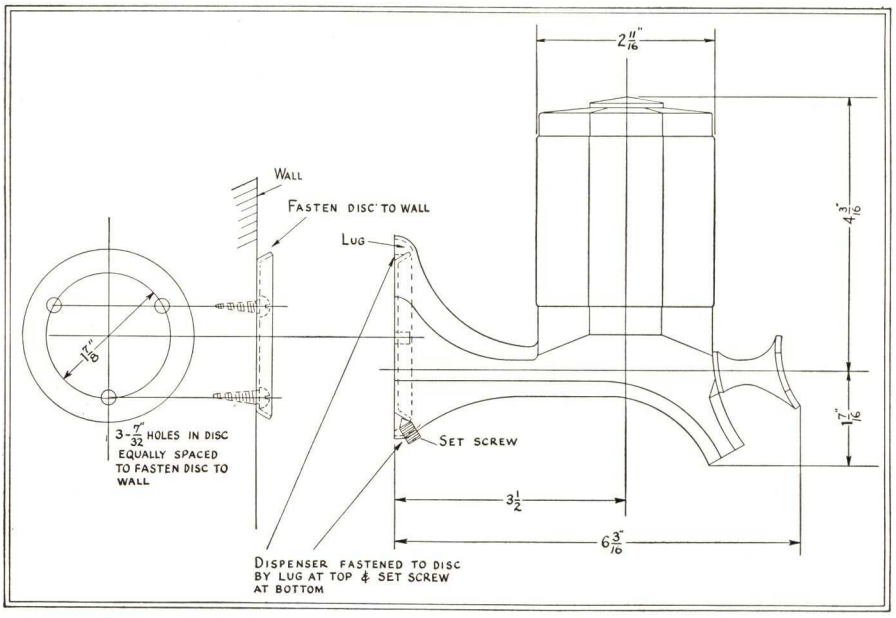
Dispenser can be installed on vertical surfaces in a few minutes. A specially designed dispenser is available for installation on lavatories or other horizontal surfaces. (Details on request.) Equally satisfactory for new building installations or for modernizing washrooms in older buildings.

Economy—

Low in first cost and upkeep. 1/100 of a cent for a completely satisfactory wash-up.



Delivers Genuine Ivory Soap in Fine, Free-flowing Flakes or Granules
Not a liquid soap dispenser



Careful tests have shown that Ivory Dispensers assure a substantial reduction in soap costs. Dispensers are leakproof—no soap is wasted.

Soap—

Pure, gentle, rich lathering Ivory Soap in uniformly fine, free-flowing *flakes* or *granules* is provided for Dispenser. Safe for both face and hands.

Packed in pound boxes with handy metal spout for easy filling of dispenser.

Price—

Special contract prices for large installations furnished upon request.

U. S. SANITARY SPECIALTIES CORPORATION

Originators "Soaperior" Liquid Soap Systems

435 South Western Avenue, CHICAGO, ILL.

BRANCH OFFICES

NEW YORK, N. Y., 59-63 East 12th Street

BIRMINGHAM, ALA., 2305 Morris Avenue

PRODUCTS

"Soaperior" Dispensers and Valves for Liquid, Lather, and Powdered Soaps; Individual Fixtures or Gravity Systems.

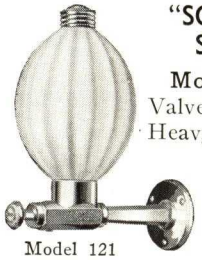
Also Sanitary Napkin Vendors, Paper Towel and Toilet Paper Fixtures, Waste Receptacles, Sanitary Requisites.

GUARANTEE

Every "Soaperior" Soap Valve and Dispenser carries a five years' guarantee against defect in material or workmanship.

Soaperior

"SOAPERIOR" LIQUID SOAP DISPENSERS



Model 121

Model 121—Push-in type. Valve mechanism nickel silver. Heavy white metal bracket chrome plated. 18-oz. capacity fluted globe. Globes opalescent, clear, canary yellow, jade green or black glass; also all-metal chrome plated. Projection 6⅛ in.; height, 7¼ in.

Model 123

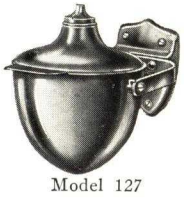
Model 122—Identical to Model 121, except has right-angle bracket to attach through cockhole in basin slab. Height 10¾ in. above slab; 4-in. shank; projection 6¾ in.

Model 123—Pullman type individual dispenser for installation in basin cockhole. Globe concealed beneath basin slab. Furnished with either straight-sided or pear-shaped globes. With standard shank for lavatories up to 1¼ in. thick and extra-long shanks for lavatories up to 4½ in. thick.

Model 128

Model 128—Tilting type 12-oz. capacity frosted or clear glass or metal globe chrome plated. Concealed fasteners optional. Height 5 in.; projection 6 in.

"SOAPERIOR" POWDERED SOAP DISPENSER



Model 127

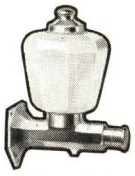
Model 127—Tilting type. All metal, chrome plated. Concealed fasteners optional. Clog-proof mechanism. Capacity 8 oz. Height 5⅜ in., projection 6 in.

"SOAPERIOR" LATHER VALVES AND DISPENSERS

Model 140

Gravity lather valves and dispensers considerably reduce soap consumption.

Gravity Lather Valve Model 140—Attaches to standard liquid soap line. Octagonal, chrome plated, female connection. Length 3½ in.



Model 141

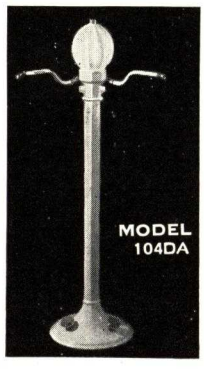
Individual Lather Dispenser Model 141—Removable frosted glass globe, concealed fasteners, chrome bracket. Octagonal design. Capacity 10 oz. Projection 5¼ in., height 6¾ in.

Models 143 and 144—Similar to Models 123 and 124, but for lather instead of liquid.

Model 121E

HOSPITAL LIQUID SOAP DISPENSER

Model 121E—Elbow-operated. Continuous flow valve. Extension of flange from wall, 11 in. Other specifications same as Model 121.



HOSPITAL LIQUID SOAP DISPENSER

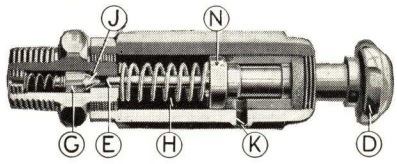
Model 104DA—Portable surgical soap dispenser. White porcelized hexagonal pedestal with two swivel arms. Foot operated. Fluted white opalescent glass globe holds ½ gal. soap. Continuous flow mechanism.

Height 51 in.; diameter of base 14 in.; spout clearance 43 in.; center of dispenser to end of spout 17 in.

Also Model 104-SA Portable, like Model 104-DA, but with one swivel arm; Model 104-FP gravity type, with tank and foot treadle; Model 121-FP, consisting of No. 121 with foot treadle attachment.

"SOAPERIOR" GRAVITY LIQUID SOAP VALVES

Fig. 103 Liquid Soap Valve—Handsome hexagon casing, brass or nickel silver, chrome plated. Incorporates exclusive patented check union (G) which holds unusual pressure and acts as shutoff, permitting removal of valve while other valves on same line remain in use. Cannot leak, nor discharge soap in steady stream. Extension 4 in.



High Pressure Installation—Where high pressure is developed by location of tank more than 24 ft. above lavatory, specify Fig. 103HP "Soaperior" High Pressure Valve. (See "Pent House Installation.")

Model 124

Model 124—Pullman Type Basin Cock Gravity Valve—Mounted on basin slab through cockhole. Connects to gravity system. Nickel silver, buffed or chromed. For lavatory 2½ in. thick or less. Longer shanks to order.

SOAP TANKS

Tanks may be exposed or concealed in recess cabinets, closets, etc.

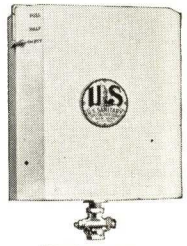
Model 100—Round spun rust-resisting metal, white or gray enameled. Metal strainer and fluid soap gauge. 1, 2, 3 and 5-gal.

Model 101—Monel metal—otherwise identical to Model 100. Buffed, enameled or chromed.

Model 203—Rectangular armco metal tank porcelain enameled inside and out. Exposed metal parts chromed. Float gauge with arrow indicator and strainer. 1, 2½ and 5-gal.

Model 205—White vitreous china rectangular tank; dial fluid gauge. 1, 2, 5 and 10-gal.

Model 100-101



Model 203

PENT HOUSE TYPE INSTALLATION

"Soaperior" Storage Tank Model 300 (15, 35, 65 or 110-gal. capacity) installed in upper section of structure adjacent to pipe shafts, piping liquid soap to "Soaperior" High Pressure Liquid Soap Valves over lavatories. *Unless our high pressure valve 103HP is specified, recommend pressure regulators every four floors.*

Model 300

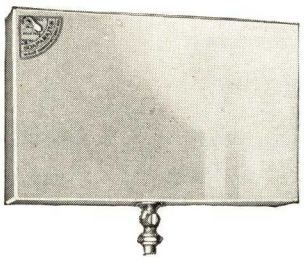
WEST DISINFECTING COMPANY

Manufacturers of Liquid Soap Dispensing Systems

42-16 Barn Street, LONG ISLAND CITY, NEW YORK

BRANCHES IN PRINCIPAL CITIES

SOAPARATUS LIQUID SOAP DISPENSING SYSTEMS—LATHERATOR LIQUID SOAP DISPENSERS

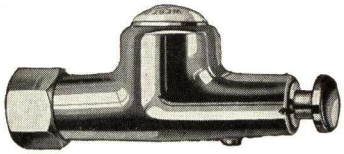


Soaparatus Tanks

Soaparatus Tanks are made of vitreous china, vitreous enamel on welded sheet iron or white enamel on rustproof sheet metal, and are designed to cover a minimum amount of wall space. They are made in approximately one, two, three or five-gallon sizes. If it is desired, the entire system, including nickel-plated piping, unions, shutoffs and all parts can be made at our factory to be shipped complete and assembled for exposed installation.

TANKS

No.	Fluid content, gal.	Height, in.	Width, in.	Depth, in.
Vitreous China Soaparatus Tanks				
1	1	8 5/8	10	4 3/8
2	1 3/8	9 1/4	12 3/4	4 1/4
3	2 1/8	9 3/4	15 3/4	4 1/2
5	3 7/8	12 3/4	16 1/4	5 1/2
Monel Metal Tanks				
2	2	12	13	3 1/8
3	3	12	15	3 7/8
5	5	15	16	5 1/2
Metal Tin Tanks				
1	1	8 1/2	9 1/8	3 3/4
2	1 3/4	9 3/4	12	3 7/8
3	2 1/2	10 1/2	15	3 7/8
5	4 1/4	12	15 3/4	5 1/4
10	10	18	22	6



Soaparatus Valve

Mechanically efficient and designed to harmonize with the finest plumbing fixtures. The patented air chamber, within the dome on the upper side of the valve, starts a gravity discharge when the plunger is pushed. The supply from the main reservoir is shut off automatically as the plunger is operated and a predetermined correct amount of soap flows gently into the hand without splashing or squirting.

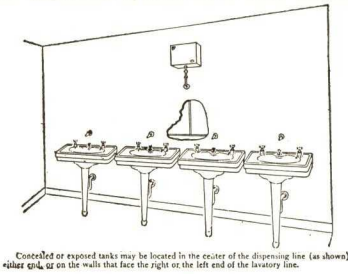
The inlet of the Soaparatus Valve is made of tool steel gauged within .00025 in. and the plunger which fits into this inlet is made of selected drill rod. These parts fit so accurately that they can withstand the pressure of more than 150 lbs., without causing the valve to leak. This careful gauging in every part of the valve makes the assembled product as nearly mechanically perfect as possible.

The Soaparatus Valve has been adapted also to a basin fixture, being a simple adaptation of the standard valve to meet this condition.

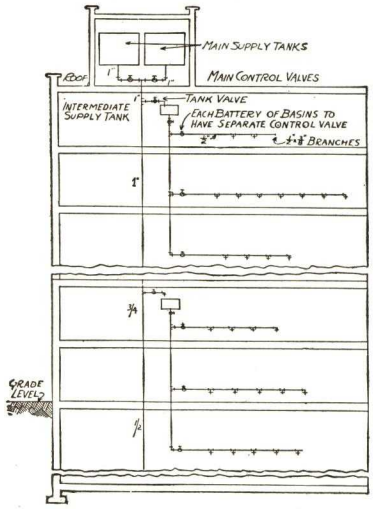
The Soaparatus Valves are finished in nickel or chromium to conform with the other fixtures.

Scope of West Service

West Disinfecting Company has a national reputation for the quality of its products. The experience of this company in installing soap dispensing systems in buildings of every type offers architects, builders and owners a service that will prove of exceptional value. Being the country's leading makers of liquid soap, service organizations are maintained in the larger cities thus insuring every co-operation after dispensing systems have been installed.



Concealed or exposed tanks may be located in the center of the dispensing line (as shown) at either end, or on the walls that face the right or the left end of the lavatory line.



Preferred layout, using double supply tank and relay tanks to reduce pressure.

Engineering Service

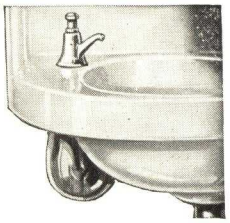
We maintain an Engineering Department Service for consultation with architects and engineers or owners of buildings.

Individual Soap Dispensers

Individual soap dispensers also furnished.

Pullman Type Latherator

Can be filled without removing globe



No. 1 Tilting

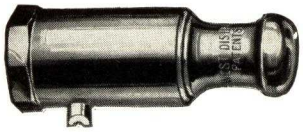
No strain on wall

No. 50 Push In

Globes replaceable

Installation

The Soaparatus system, due to its flexibility, is admirably adapted to varying conditions of installation. One tank may be used to supply any number of valves, and extensions may be made as required, provided they are at a level at least a foot lower than the location of the supply tank in order to provide proper gravity flow. When installed in connection with new construction, where provision has been made in the plans or where existing conditions will permit, the piping from the tank to taps may be concealed, creating an exceptionally neat appearance. In cases where it is impossible to conceal the piping a thoroughly attractive installation is provided by the use of nickel-plated piping throughout.



Latherator Dispenser

The West Latherator introduces a brand new principle in liquid soap dispensing. Ordinary soap dispensers merely dispense liquid soap and leave it to the user to work up a lather. But the Latherator automatically agitates the soap into a rich, creamy lather before it leaves the outlet. Users say that no other type of soap dispenser makes washing so pleasurable as the Latherator.

The West Latherator offers a real economy in operation over other liquid soap dispensers. Less soap solution is used by a person washing with the Latherator than by one trying to work up a lather with the ordinary dispenser. None of the soap runs off the hands unused. Careful tests made by purchasing departments of large users show that a gallon of soap will wash from 40% to 50% more hands when dispensed through a Latherator than when used through other types of dispensers. The saving over a period will cut the owner's soap costs in half.

The lather making is all done in the Latherator valve. This can be attached to any liquid soap supply line, without any change, except the removal of the old valves and the substitution of the new Latherators. In addition to supply line outlets, Latherators are made in two other models:

The Pullman, which attaches to the wash bowl.

The Self-contained Unit, which is attached to the wall over the washbowl.

Latherators are finished in either nickel or chromium to conform with the other fixtures.

KITCHEN AND SERVICE EQUIPMENT
- SECTION - 28

Section Number 1/5 Catalog Number

CATALOGS 1 to 67

MANUFACTURERS

THIS INDEX INCLUDES ONLY MANUFACTURERS WHOSE CATALOGS ARE FILED IN THIS SECTION

Acme Metal Products Corp. 28/1
Aluminum Cooking Utensil Co. 28/22
Art Metal Construction Co. 28/3
Baker Ice Machine Co., Inc. 28/38
Boro Wood Products Co. 28/2
Chicago Dryer Co. 28/44
Colt's Patent Fire Arms Mfg. Co. 28/25
Curtis Companies Service Bureau. 28/4
Curtis Refrigerating Machine Co. 28/39
Dieterich Steel Cabinet Corp. 28/5
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ACME METAL PRODUCTS CORP.

1845 West 74th Street, CHICAGO, ILL.

STEEL KITCHEN-UNIT COMBINATIONS

The Acme Steel Kitchen-unit combinations shown on this and the following two pages illustrate a number of the arrangements most frequently used in laying out a completely modern kitchen for a new home or in the remodeling of an old one.

As each of these are a grouping of Acme Steel Kitchen-units, each may be arranged for an unlimited range of floor and wall space.

For conditions where wall and floor space available varies from the dimensions given for these illustrations it is suggested that you make request for drawing and specifications, sending the blue print of your drawing or accurate dimensions of space, including ceiling height, window openings and whether or not it is desired that wall cabinets occupy wall space to ceiling.

Acme Steel Kitchen-units are made to the following dimensions:

Base Cabinets—Without bases or tops; 24¾ in. deep, 30½ in. high, and 18, 21, 24, 30 and 36 in. wide.

Sink Cabinets—For use with porcelain enamel sinks of the cabinet type, without bases or tops; 24¾ in. deep, 30½ in. high, 60 in. wide.

Bases—Steel, continuous, four sided; 4 in. high, 20¾ in. deep, recessed 4 in. from front of cabinets for toe space.

Wall Cabinets—13 in. deep; 18, 30 and 36 in. high; 18, 21, 24, 30 and 36 in. wide.

Broom and Linen Cabinets—18 and 24 in. wide, 13 and 24¾ in. deep, 80 and 86 in. high, without bases.

Cabinet Tops—Of linoleum applied to steel core and with stainless steel nosing; porcelain enamel, stainless steel or monel metal. 25 in. deep, 1½ in. thick and made in any length desired, continuous straight, "L" or "U" shape.

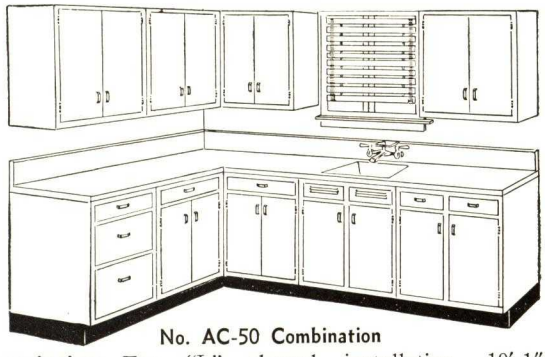
Sink Tops—Linoleum with single or double compartment sink bowls built in of porcelain enamel or stainless steel or monel metal. Stainless steel or monel metal with bowls of same material. All are 25 in. deep, 1½ in. thick, with or without back and ends.

Accessories—***Corner Wall Angle and Corner Wall Plate***—For use when wall cabinets occupy "L" or "U" shaped spaces. Finished same color as cabinets.

Corner Base Angles—For use when base cabinets occupy "L" or "U" shaped space. Finished same color as cabinets.

Filler Panels—For use between wall and base cabinets to take up odd sized spaces. Finished same color as cabinets.

Moulding Strips—For connecting cast iron porcelain enamel sinks and adjoining cabinet tops. Made of aluminum buffed and polished.



No. AC-50 Combination

Description—For "L" shaped installation. 10'-1"x5'7", height 7'. Sink roughed in at 36" from floor. Continuous "L" shaped linoleum, monel metal, or stainless steel sink and work top.

Specifications—

1 "L" shaped sink and top 25"x121"x67" with 8" back	
3 Wall cabinets	WC-30-30
1 Wall cabinet	WC-24-30
2 Corner fillers	CWF
1 All-drawer base cabinet	D -18
2 Drawer and cupboard base cabinets	CD -24
1 Drawer and cupboard base cabinet	CD -36
1 Sink front	SF -36
1 Sub-base	B-46
1 Sub-base	B-28
1 Sub-base	B-72
1 Corner filler	CBF

Soffit Lights—For illuminating cabinet tops and sinks—installed under wall cabinets when specified.

Slicing Boards—Loose or installed in base cabinets. Loose boards are 8½ in. x 13 in.—installed boards 18 x 24 in.

Cutlery Drawer—Has linoleum lined bottom and dividers to form three compartments.

Bread and Cake Box—For use in deep, base cabinet drawer.

Flour or Sugar Containers—For use in deep, base cabinet drawers.

Sliding Flour Sifter—Approximately, 12 lbs. capacity, installed in wall cabinets when specified.

Condiment Rack—A step shelf installation for use in wall cabinets.

Utility Shelf—6 in. deep; 24, 30 and 36 in. wide, complete with back splash.

Cane Metal Doors—Installed in base cabinets, when specified, for added ventilation.

Glass Doors—When specified for wall cabinets.

Details—Made of No. 1 prime cold-rolled auto-body sheet steel—the best material possible to secure. Easily workable; as enduring as the kitchen itself and presenting the best possible surface for finishes that will stand up under all conditions.

Bases—Acme bases are optional in the buying or installing. They are included in the specifications because they are the most satisfactory to use. They are recessed 4 in. for toe space, permitting easy posture and eliminating scuffing and mop marks.

Finishes—Synthetic, high-heat baked enamel. Exceedingly hard but flexible. Free from checking and cracking.

Colors—White, ivory, green or gray.

Color Combinations—Bodies green with white doors and drawers. Ivory bodies with white doors and drawers. Bodies in dark ivory with light ivory doors and drawers. Gray bodies with white doors and drawers.

Doors and Drawers—Dustproof, soundproof, flush with cabinet. Spring type door catches and rubber bumpers.

Drawer Runners—Special Acme design. Non-sag, non-stick. Operate with ball bearing ease.

Hinges—Bullet type, die-cast from finest grade of steel and chromium plated.

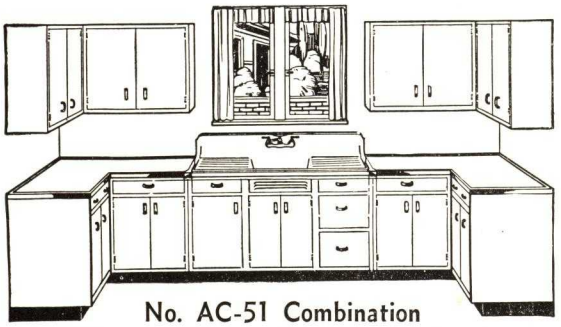
Door and Drawer Pulls—Specially designed for Acme. Chromium plated with chromium plated grommet. Highly decorative.

Sales Policy

In the new kitchen planning, which is designed to permit the work in the kitchen to proceed from beginning to end in an orderly, consecutive manner, the sink is considered as the "working center." Around it are grouped the refrigerator, the gas or electric range; the base cabinets with their working tops or counters, and above, as window space and other considerations dictate, are arranged the wall cabinets.

Into this new order of things, the plumber seems to fit most admirably. It is his installation around which all the rest takes form and his supplier, the plumbing jobber, should be the distributor.

So, in setting up this channel as the one through which to distribute this line exclusively, the Acme Metal Products Corporation feels it is doing the best possible for the architect, builder and the final owner.



No. AC-51 Combination

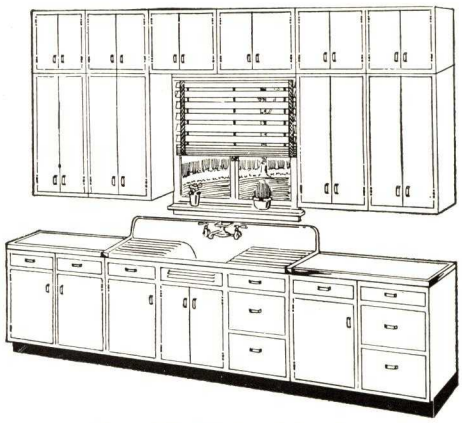
Description—For three sides of a kitchen. 13'-2"x4'-1"x 4'-1". Sink roughed in at 36" from floor. Linoleum work-top base cabinets are assembled around any cabinet type 60"x25" roll rim sink.

Specifications—

4 Wall cabinets	WC-36-30
4 Base cabinets	C D-24
1 Sink cabinet for 60"x25" sink	SC-60
4 Fillers	CWF
2 Fillers	CBF
4 Sub-bases	B-28
2 Moulding strips (right and left)	
2 "L" shaped linoleum tops 48⅝"x48¾"	

ACME METAL PRODUCTS CORP.

ACME STEEL KITCHEN-UNIT COMBINATIONS



No. AC-52 Combination

Description—Built around 60"x25" roll rim cabinet type sink. 12' long x 9' (ceiling height). Regular wall cabinets surmounted by bank of wall cabinets 18" high. Sink roughed in at 36" from floor.

Specifications—

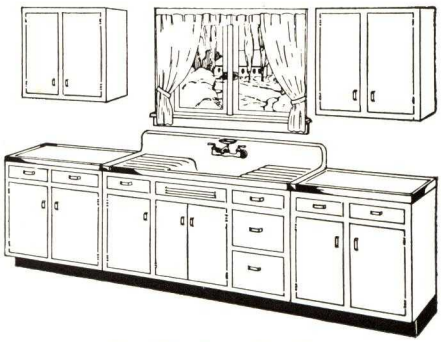
6 Wall cabinets WC-24-18
4 Wall cabinets WC-24-36
3 Drawer and cupboard base cabinets CD-21
1 All-drawer base cabinet D-21
1 Sink cabinet for 60"x25" sink
2 Sub-bases B-42
2 Linoleum tops 41⅞" long
2 Moulding strips (right and left)

No. AC-53 Combination

Description—Composed of base, wall and linen and broom cabinets. Assembled around 60"x25" cabinet type roll rim sink roughed in at 36" from floor. 12' long by 7' high. Linoleum work tops on base cabinets.

Specifications—

2 Wall cabinets WC-36-30
1 Broom cabinet (left swing) BC-18-80-B
1 Linen cabinet (right swing) LC-18-80-I
1 Drawer and cupboard base cabinet CD-24
1 All-drawer base cabinet D-24
1 Sink cabinet for 60"x25" sink
2 Sub-bases B-42
2 Linoleum tops 23⅞" long
2 Moulding strips (right and left)



No. AC-54 Combination

No. AC-54 Combination

Description—Over-all dimensions 11' long by 7' high. Grouped with 60"x25" cabinet type roll rim sink, roughed in at 36" from floor. Linoleum top base cabinets.

Specifications—

2 Wall cabinets WC-36-30
2 Drawer and cupboard base cabinets CD-36
1 Sink cabinet for 60"x25" sink
2 Sub-bases B-36
2 Linoleum tops 35⅞" long
2 Moulding strips (right and left)

No. AC-55 Combination

Description—Over-all dimensions 9' long by 7' high. Wall cabinets, shelf and back splash over base cabinets and 60"x25" cabinet type roll rim sink roughed in at 36" from floor. Linoleum work tops.

Specifications—

2 Wall cabinets WC-36-30
1 Wall cabinet WC-36-18
1 Shelf and back splash
2 Drawer and cupboard base cabinets CD-24
1 Sink cabinet for 60"x25" sink
2 Sub-bases B-24
2 Linoleum tops 23⅞" long
2 Moulding strips (right and left)

No. C-56 Combination

Description—Composed of refrigerator with porcelain enamel work top; 42" cabinet type roll rim sink; 4-burner gas range and wall cabinets. Over-all dimensions 8' long by 7'.

Specifications—

2 Wall cabinets WC-30-30
1 Wall cabinet WC-36-30
1 Cabinet for 42" roll rim sink
1 Refrigerator (complete with porcelain enamel top)
1 Floor type gas range (4-burner)

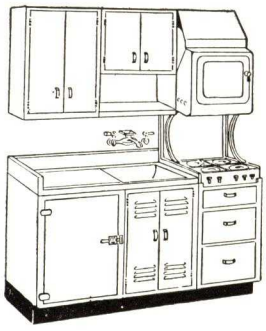
No. AC-57 Combination

Description — Over-all dimensions 6' long by 7' high. Drainboard, linoleum with porcelain sink bowl. 4-burner gas stove, fully insulated. Refrigerator capacity, approximately, 5 cu. ft.

Specifications—

2 Wall cabinets WC-24-30
1 Wall cabinet WC-24-18
1 Shelf and back splash 24"
1 Utility drawer 18" wide
1 Refrigerator cabinet 24" wide
1 Sink front ..... SF-24 (right end return)
1 Sub-base B-48
1 Sink and top 48" with back and end
1 Floor type 4-burner gas range

ACME STEEL KITCHEN-UNIT COMBINATIONS



No. AC-58 Combination

Description — Fully insulated 4-burner gas stove, combination broiler and overhead oven. Over-all dimensions 6′ long by 7′ high. Drainboard linoleum, with porcelain sink bowl.

Specifications—

1 Wall cabinet WC-24-30
1 Wall cabinet WC-24-18
1 Shelf and back splash 24″
1 Range canopy 24″
1 Refrigerator cabinet 24″
1 Sink front SF-24
1 Range base for overhead oven range
1 Overhead oven range
1 Sink and top 48″ with 3″ back and end
1 Sub-base B-72

No. AC-59 Combination

Description — Over-all dimensions: 7′ 6″ long by 7′ high. Side oven, 4-burner, fully insulated gas range with canopy and base cabinet. Sink top —linoleum with porcelain sink bowl.

Specifications—

1 Wall cabinet WC-30-30
1 Wall cabinet WC-24-18
1 Shelf and back splash 24″
1 Wall cabinet WC-36-18
1 Stove canopy 36″
1 Refrigerator cabinet 30″
1 Sink front SF-24
1 Range base cabinet 36″
1 Sink and top 54″ with 3″ back and end
1 Sub-base B-90

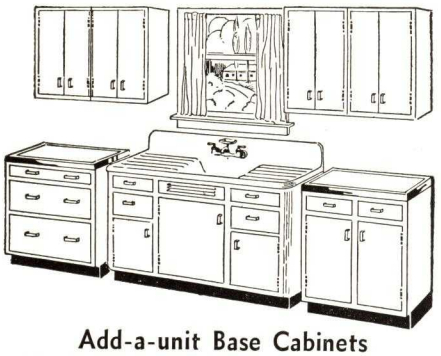
No. AC-60 Combination

No. AC-61 Combination

Description—For use alone or as the working centers for larger Acme Steel Kitchen-unit Combinations. Tracy linoleum tops and sinks with 8″ backs. Work tops may be extended to any size required for larger combinations, to make continuous working tops.

Specifications—
Over-all dimensions: 60″x25″. Top and sink roughed in at 36″ from floor.

Specifications—
Over-all dimensions: 48″x25″. Work tops and sink roughed in at 36″ from floor.



Add-a-unit Base Cabinets

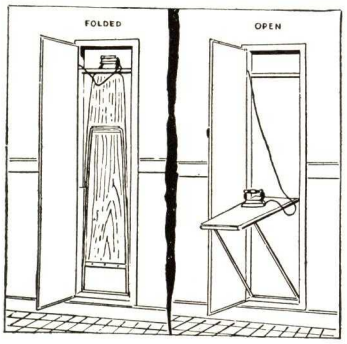
Description—Square corner, linoleum work-top base cabinets. Shown with regular Acme Steel Kitchen-unit Wall Cabinets and 60″x25″ roll rim round corner porcelain enamel sink. May be used singly or in multiples in any of the sizes specified, permitting additions to the original installation at any time. Two or more of these cabinets may be joined with continuous work-top or with square corner roll rim cabinet type sink.

Specifications—18″, 21″, 24″, 30″, 36″ wide.

"Free-standing" Base Cabinets

Description — For use with either roll rim or apron type round corner sinks. Cabinets, round corner. Linoleum worktops.

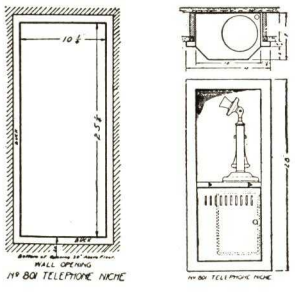
Specifications—24″, 36″ and 48″ long x 23″ deep.



Steel Ironing Board Cabinet

Description—Made of Cabinet cold rolled steel, sprayed and high-heat baked to a smooth, hard finish. High quality wood ironing board lowers to 36″ from floor. Extends 50″ from cabinet and will support weight of 150 lbs.

Specifications—
Outside over-all dimensions 68″ x 17″ x 5″. Inside 65″ x 14″ x 5″. Wall recess required 65½″ x 14¼″ x 4¼″. Located 9½″ from the floor.



Steel Telephone Niche

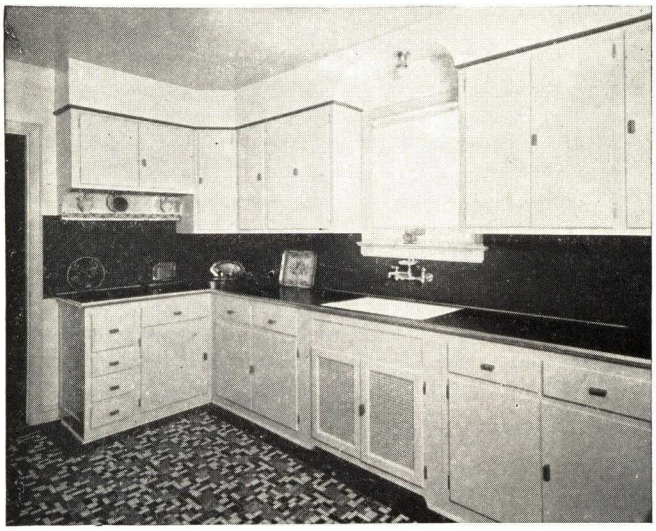
Description—For hallway, nook or passageway. Phone compartment will accommodate standard pedestal or cradle type of instrument. Ample space for bell-box with door in front. No trimming or fitting. Just place in wall space, insert screws and draw up snug.

Specifications—
Over-all dimensions 28″ high, 13″ wide, 4½″ deep. Wall opening required: 25¼″x10″x4½″.
Can be furnished in any Acme standard color or with rustproof bond coat for finishing to match rest of trim.

BORO WOOD PRODUCTS CO.

Manufacturers of Kitchen Cabinets

MASPETH, LONG ISLAND, N. Y.



MODERN SCIENTIFIC KITCHEN CABINETS

Boro Wood Products Co., specializes in building scientifically designed kitchen cabinets in both special and stock sizes and to the direct specifications of the architect. The Company maintains a designing staff for the purpose of co-operating with architects in kitchen planning and layout. As a result of years of research and experience in the production of fine cabinet work, we are in a position to efficiently produce these items in any variety of unique designs, or to harmonize with any conceivable color combination or decorative scheme.

Our stock models emphasize the Boro Company's ability to combine a high degree of utility and convenience with beauty and economy.

General Specifications for Boro Cabinets

Boro Cabinets are made of thoroughly seasoned, selected hardwood of high quality, kiln-dried to a maximum of 5% moisture content. All joinings are mortised and tenoned; shelves are dadoed into sides of cabinet.

Doors—*Panel type,* use laminated plywood paneling with 1⅛-inch mortised hardwood styles and rails.

Flush doors constructed of 13/16-inch hardwood laminated plywood, and banded edge to minimize warping.

Hardware—Bright or dull chromium finish; rustproof metal of modern design. Knobs can be had in both dull and polished chromium also in red, blue, green, horn, ivory and black catalin composition.

Cabinet Finish—Triple spray coated finish of Du Pont paints. Each coat is perfectly sanded and kiln-baked to assure a smooth and lasting finish. The high quality of the resulting finish is an outstanding feature of the Boro Cabinet line.

Inspection—Before leaving the factory, all units are subjected to a thorough and rigid inspection.

Boro Cabinet Sink and Counter Tops

The Boro Company manufactures a complete line of metal edge 3/16 inch linoleum sink and counter tops in a variety of colors. These sinks can be built to any specification, such as, "U" shape, "L" shape—and with cutouts in any size.

Boro Cabinet Linoleum Composition Sink and Counter Tops cannot chip, craze or crack. With ordinary care these sinks and tops will last a lifetime. The Boro sink enables the architect to offer to his clients linoleum composition sinks of excellent workmanship and quality.

We are also distributors of stainless steel, monel metal and iron enamel cabinet sinks.

The Complete Boro Line

Boro standard models include corner, centered or in-line units and cabinet's made to use in combination with sinks, having full or half length wings.

ART METAL CONSTRUCTION COMPANY

Household Cabinet Division
JAMESTOWN, N. Y.

For Branch Offices, see Bank, Office and Library Equipment Section
For Metal Doors and Trim, Steel Partitions, Bank, Office and Hospital Equipment, Museum Cases, see File Index

THE ART METAL KITCHEN

Based on the fact that a kitchen divides itself into six natural "work centers" Art Metal has designed utility and beauty in its Work Center Kitchens. In Art Metal Kitchens the work moves progressively forward with no lost motion, no unnecessary steps, no superfluous bending or reaching. There is a smooth, effortless flow of motion from planning to serving.

Art Metal
Jamestown, New York
U.S.A.
TRADE-MARK

Art Metal is a familiar name to thousands of business men. For fifty years it has been associated with office modernization, efficiency, economy and beauty. It is logical that these engineers who systematized office equipment, saving time, labor and expense for the business office should turn their attention to the workshop of the home. They have enlisted the aid of home economists and architects to make the Art Metal Work Center Kitchens the last word in modern convenience.

The secret of the convenient arrangement of Art Metal Kitchens lies in the completeness of each work center and in the relationship of one center to the other. Exhaustive study has determined the proper sequence of the centers to make each independent of the other yet combining to form a kitchen functioning as an integral unit.

Art Metal Work Center Kitchen

(1) Planning Center—An invitation to sit down and plan meals, to order groceries, keep accounts, systematize your time.

(2) Food Storage Center—Includes the refrigerator and storage space for packaged and canned goods.

(3) Food Preparation Center—This is the combining and mixing center and includes space for all the utensils and appliances used in preparing food.

(4) Cooking Center—The range and cabinets for storing condiments and utensils used on the stove.

(5) Serving Center—Dishes are assembled and the "final touch" given here.

(6) Cleaning Center—The sink, dishwasher, garbage disposal means, towel rack, cleaning materials. Also vegetable pans and other utensils first used at the sink.

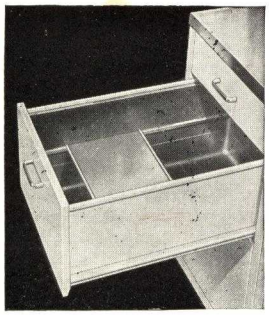
Any kitchen can be planned or rearranged in this manner. Through this systemization you gain freedom from fatigue, new hours of leisure, new enjoyment while working.

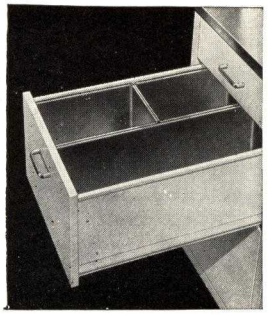
The Art Metal Household Institute will be glad to co-operate with architects and will prepare floor plans and elevations on request. The Institute makes no charge for its services and you may confidently rely on its recommendations.

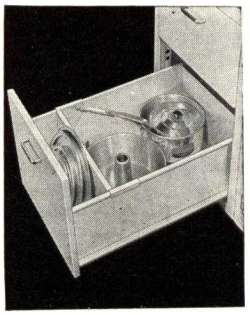
Every Art Metal Kitchen enjoys the same basic features and advantages yet few are exactly alike. Each reflects the personalities and preferences of the owner.

There are plenty of work surfaces all on one continuous level, strategically placed for each work center and at the proper restful height. Food is stored at the point of its first use. Pots, pans and mixing bowls literally coast into sight in easy gliding, non-warping noiseless steel drawers. The full storage space in base cabinets is made available by use of drawers.

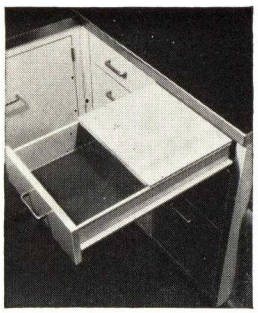
Monel, stainless steel or Artolin composition work tops are supplied to fit either a single base cabinet or a multiple arrangement of base cabinets from 15 to 115 in. in fractional inch increments. Specify when end splashers, right or left or both sides are required. End splashers are used adjacent to sidewalls but are not used when the cabinets are free standing.


Bread Bin


Bulk Storage Bin


Lid Rack

Cutlery Tray


Slicing Board

Roller Glider Drawer Suspension

All the drawers in base cabinets are now equipped with the new Roller-Glider, ball-bearing drawer suspension as standard equipment without extra charge. Smooth, effortless, easy operating, they open at a touch of the fingers.

Optional Drawer Combinations

The standard drawer arrangement is Drawer A, top; Drawer B, center; Drawer C, bottom. This arrangement may be varied in combinations B, A, C, and A, A, A, C. No other combinations are possible. It is not necessary to use drawer letters in ordering standard units. Use the drawer letters A, B, and C in the desired sequence in ordering special combinations.

Linen Cabinets

The linen cabinets are equipped with three sliding, removable trays and two full depth adjustable shelves. The double door cabinet is as illustrated, 24 in. wide. The cabinet may also be had in 15 and 18-in. widths, having a single door.

Implement Cabinets

The cleaning implement cabinet has the same exterior appearance as the linen cabinet but is especially equipped with broom hooks and half-width shelves. Such an arrangement allows space for vacuum cleaner and other large implements.

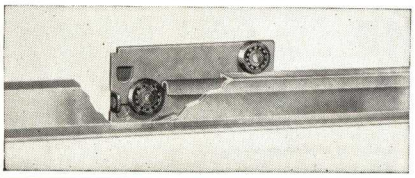
Sink Cabinets and Dish Washer Enclosures

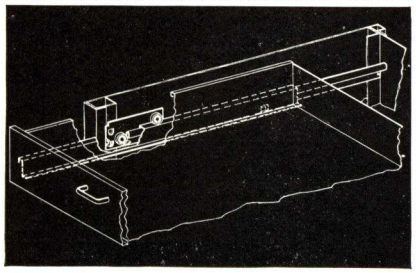
Sink cabinets provide space for all necessary cleaning materials and implements, refuse container, storage bins, etc. Art Metal Dishwasher enclosures fit the electric unit perfectly. All parts are protected and enclosed by the steel cabinet. Door and drawer fronts and the sink itself are thoroughly insulated to absorb noise.

Sink bowl may be either Monel, stainless steel or porcelain. Sink top may be either Monel, stainless steel, Artolin or porcelain.

Accessories

Enclosed bread, cake bins, and bulk storage bins, removable cutlery trays (two types), slicing boards, towel rods and racks for various uses attached to the drawers or fitted into the drawers.





Top:
Roller-Glider Suspension and Drawer Member

Bottom:
Relation of Drawer and Case Members to Roller-Glider Suspension

Wall Cabinets

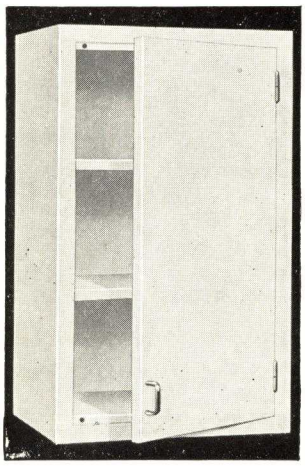
Shelves are adjustable at 1-in. intervals on supports that may be changed without tools. Cabinets are fully finished on all sides and any cabinet may be used at any point in an installation.

Base Cabinets

All base cabinets are 30½ in. high, 24¾ in. deep. They are to be mounted on a base set back 3½ in. to allow a 4-in. high toe space at the front. Over-all height, including base and counter top, 36 in.

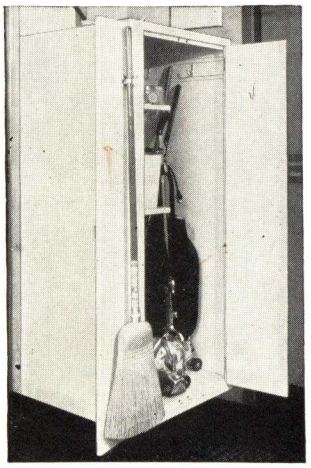
All drawers in all cabinets have an inside clear depth of 21½ in. Other clear dimensions are as follows:

Base cabinet Drawer A, clear height, 4½ in.; Drawer B, clear height, 9¼ in.; Drawer C, clear height, $13\frac{7}{16}$ in.

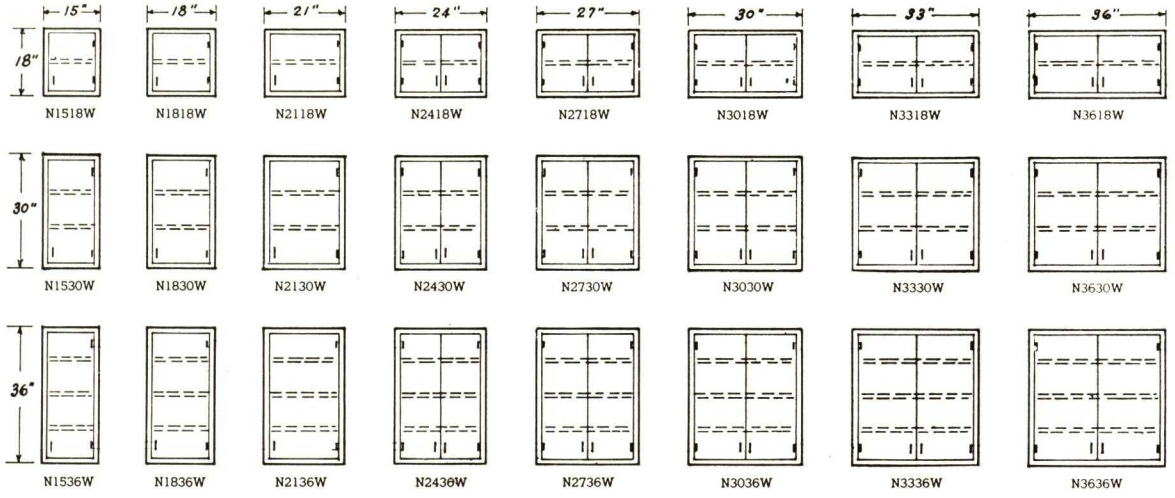

Single Door Wall Cabinet

Narrow Base Cabinet

Linen Cabinet


Implement Cabinet

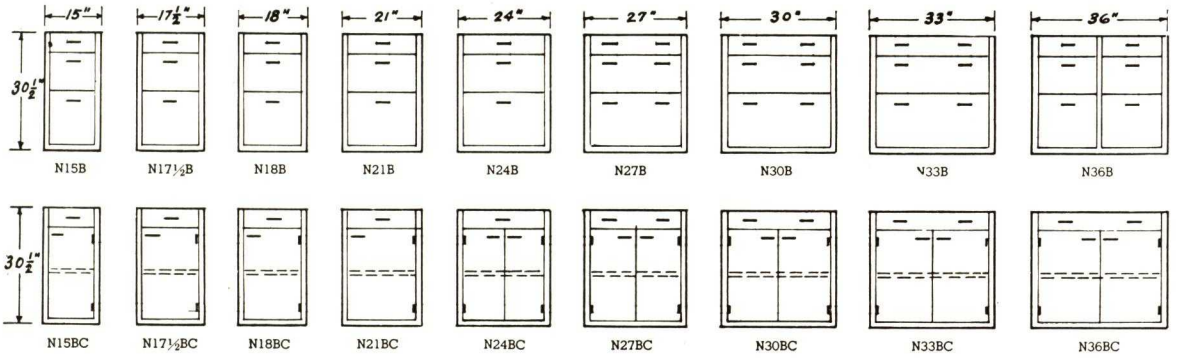
WALL CABINETS



Glass doors are obtainable for all wall cabinets.
Add suffix G to catalog number for glass doors.

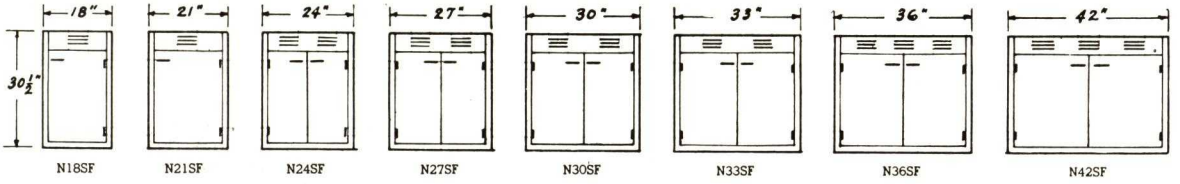
Wall Cabinets 13" deep

BASE CABINETS

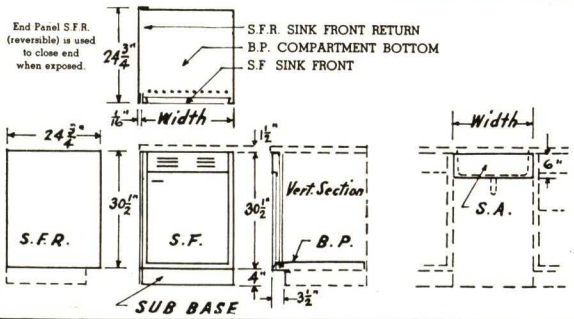


Base Cabinets 24¼" deep

SINK FRONTS



Sink Fronts are not cabinets but FRONTS ONLY furnished to conceal plumbing.
Sink Fronts are obtainable with Grilled doors.



SINK APRONS
N-18-SA
N-21-SA
N-24-SA
N-27-SA
N-30-SA
N-33-SA
N-36-SA
N-42-SA

Sink Aprons are substituted for sink fronts when local plumbing code prohibits closing plumbing space

NOTE: All single door cupboards and sink fronts are shown with right hand swing of door which is regularly furnished. Please specify when left hand swing is desired.
All shelves are adjustable 1" o. c. in height.

BASE CABINETS

NEW, Easy Operating Roller-Glider, Ball Bearing Drawer Suspension. Now Standard Equipment on all Art Metal Kitchen Cabinet Drawers. See details Plate K-7

Art Metal
Jamestown, New York
U.S.A.

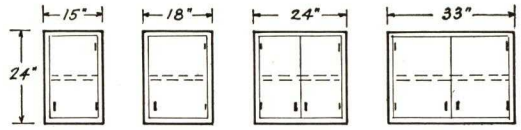
STANDARD CABINET SIZES

ART METAL HOUSEHOLD INSTITUTE, JAMESTOWN, N. Y.

KITCHEN EQUIPMENT

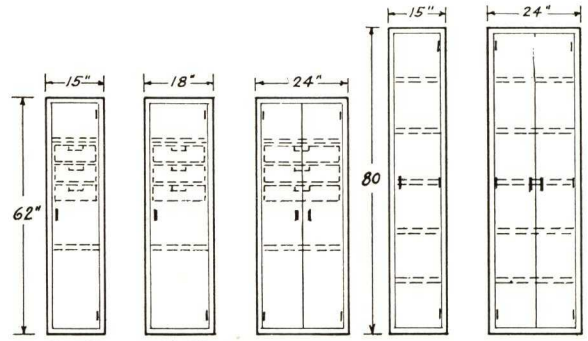
PLATE K1

WALL CABINETS



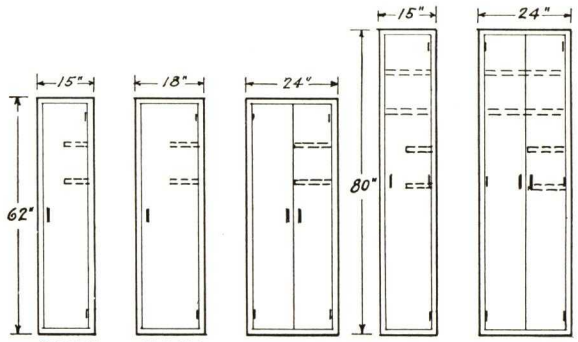
13" deep	N1524W	N1824W	N2424W	N3324W
24¾" deep	N1524¾W	N1824¾W	N2424¾W	

LINEN CABINETS



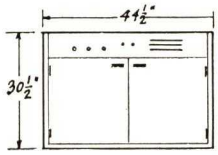
13" deep	N1513TL	N1813TL	N2413TL	N 1580 TL	N 2480 TL	
24¾" deep	N1524TL	N1824TL	N2424TL			

CLEANING IMPLEMENT CABINETS

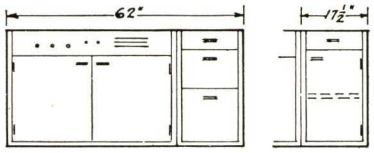


N1513TM	N1813TM	N2413TM	N 1580 TM	N 2480 TM	
N1524TM	N1824TM	N2424TM			

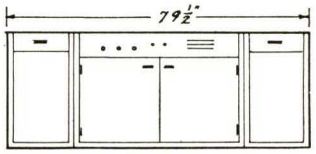
DISH WASHER ENCLOSURES (For G-E Units)



N44½DW

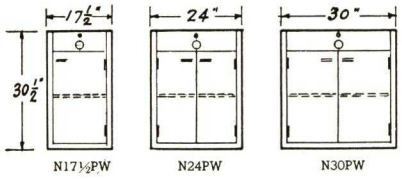


N62DW-B (=N44½DW+N17½B)
N62DW-BC(=N44½DW+N17½BC)

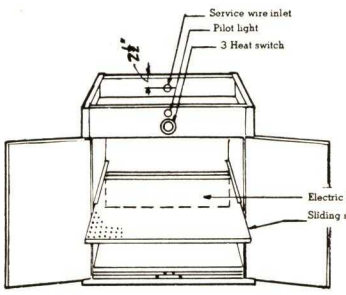


N79½DW-B (=N44½DW+2—N17½B)
N79½DW-BC (=N44½DW+2—N17½BC)
N79½DW-B-BC(=N44½DW+1—N17½B & 1—N17½BC)
Specify Right or Left. Right has N17½BC at right end.

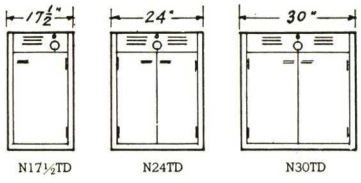
PLATE WARMER CABINET



N17½PW N24PW N30PW



TOWEL DRYER CABINET



N17½TD N24TD N30TD

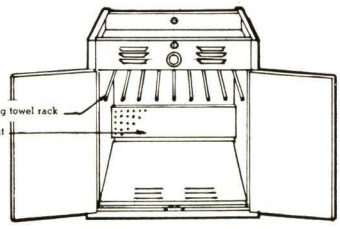
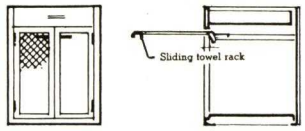


Plate Warmer and Towel Dryer Cabinets are of double wall insulated construction. Interior lining is cadmium plated. Towel Rods are nickel plated. Heating elements consist of two heating units, each of 300 Watt, 115 Volt capacity, operated by a 3 heat switch.

SUSPENSION TOWEL HOLDER

Cabinet Not Included

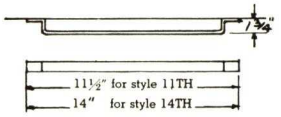
Ordinarily installed in regular BC base cabinets with grilled doors



15STH has 4 Towel Rods—Used in N15BC
18STH has 5 Towel Rods—Used in N18BC
21STH has 6 Towel Rods—Used in N21BC
24STH has 8 Towel Rods—Used in N24BC
30STH has 10 Towel Rods—Used in N30BC

TOWEL HOLDER

Ordinarily mounted on back of sink front doors



11TH used on N27SF & N30SF
14TH used on N18SF, N21SF, N24SF, N33SF, N36SF & N42SF

Art Metal
Jamestown, New York
U.S.A.

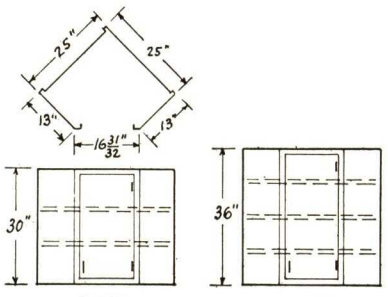
STANDARD CABINET SIZES

ART METAL HOUSEHOLD INSTITUTE, JAMESTOWN, N. Y.

KITCHEN EQUIPMENT

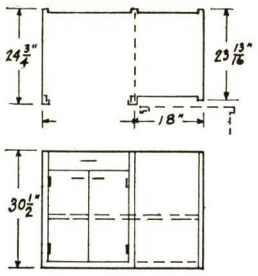
PLATE K2

CORNER WALL CABINETS



N30CW N36CW

BASE CORNER EXTENSION

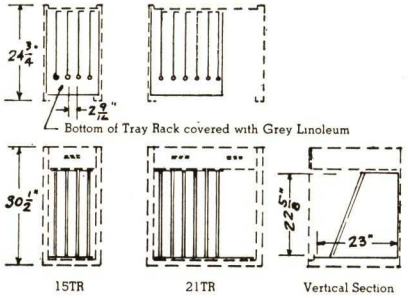


BCE—Right or Left Hand
(Right Hand shown)

Used with any BC Base cabinet when it is desirable to utilize space in corner. Use N18 Sub for extension when sub bases are required.

TRAY RACKS

(BC Base Cabinets not included)

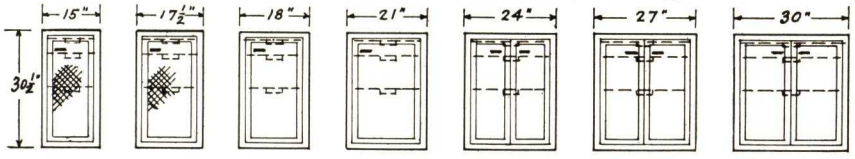


15TR 21TR Vertical Section

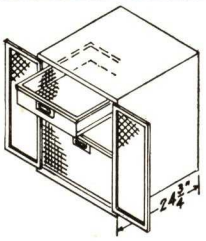
15TR used in N15BC & N18BC Base Cabinets
21TR used in N21BC, N24BC, N27BC, N30BC, N33BC & N36BC

Tray Racks are placed in center of N15, 18, 21 & 24BC cabinets In wider cabinets the rack is placed at left side

VEGETABLE CABINETS—Cupboard Type-Grilled Doors

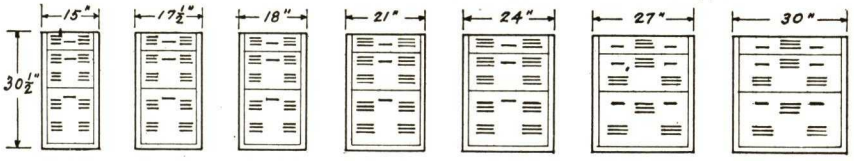


N15BVB N17½BVB N18BVB N21BVB N24BVB N27BVB N30BVB



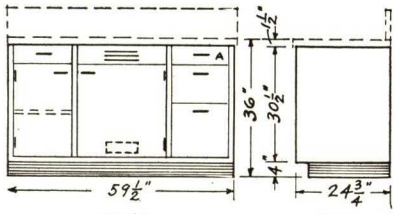
Each cabinet contains 3 Cadmium plated Cane Metal (grilled) vegetable trays on Z slide suspension.

VEGETABLE CABINETS—Drawer Type

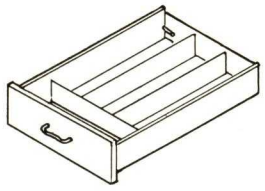


N15BVA N17½BVA N18BVA N21BVA N24BVA N27BVA N30BVA

UNDERSINK CABINET FOR 60 x 25 SINK—(Sink not included)



59½SC End View

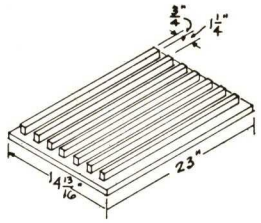


Sketch of drawer "A"

Tool & Soap Rack on inside of sink compartment door

TABLE LEAF STORAGE

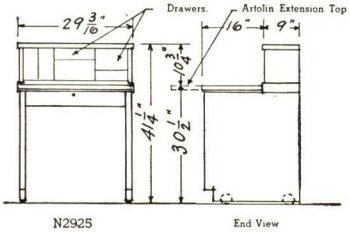
(An Insert for Cabinet)



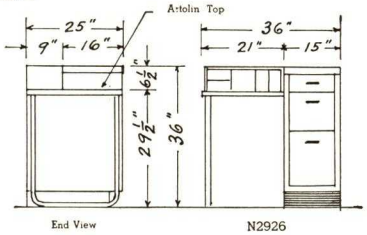
N1524TLS

2 Wood Shelves with divisions. Upper shelf adjustable in height 1" C-C Used in N1524TL and N1524TM by substituting wood shelves for regular equipment.

PLANNING DESKS



N2925 End View



End View N2926

Art Metal
Jamestown, New York
U.S.A.

STANDARD CABINET SIZES

ART METAL HOUSEHOLD INSTITUTE, JAMESTOWN, N. Y.

KITCHEN EQUIPMENT

PLATE K3

CURTIS COMPANIES SERVICE BUREAU

CLINTON, IOWA

For Plants and Sales Offices, see the first page of our catalog on Windows
For Curtis Silentite Windows, Trim, Doors and Cabinet Work, see File Index

CURTIS STANDARDIZED KITCHEN UNITS

1866 CURTIS WOODWORK

Over 50,000 kitchens have been planned by Curtis for American housewives. And Curtis is in a position to help architects plan kitchen efficiency through the Curtis Kitchen Planning Service, the most experienced in America.

There is a Curtis Sectional Kitchen Cabinet unit to fit every requirement for large or small kitchens, for modest homes or large residences.

Curtis units are available in a range of sizes so wide that any given kitchen area, regardless of measurements, may be filled *within two inches*—for both new construction and remodeling. Innumerable variations and layouts are possible through this wide range of sizes of Curtis standardized kitchen units.

Styles of Units Available

Curtis Units are available in the following types: Wall Units (W-20 and W-36 in the sketch below). Over Units for use above Wall Units; Corner Units, square and diagonal; Pan Units (P-20 in the sketch); Drawer Units (D-20); Bread Drawer Units (B-16); Broom Closet Units and Ironing Board Units (IB-20); Broom Closet Over Units (BO-20); Storage Over Units; Linen Storage Units (L-28); Grille Sink Units.

All depth and height dimensions have been established in accordance with standard dimensions for sinks, refrigerators, ranges and other mechanical units to assure alignment of counter tops and faces. In the sketch below the standard height of arrangements possible with Curtis Units are shown. Note the amount of storage space provided below 87 in.—within easy reach, also the sensible provision of 3-in. toe space at the base, and the 36-in. high counter top. Over Units placed above the Wall Units produce a 103-in. over-all height. Curtis Units make true "built-in" efficiency but with the economy of standardized, factory-made units.

Counter Top—Units designed for use below the counter are supplied without tops to accommodate counter top material of any nature. You may also use any style or type sink you wish. The Curtis dealer will provide information and prices on counter tops and sinks recommended by Curtis. Or write Curtis for complete data.

More Room from Small Space. A Typical Example of the Space-Saving Advantages of Curtis Units

Note particularly the Corner Unit eliminating all waste space usually encountered in "going around" a corner. The cabinet above refrigerator is available in many sizes for use above sinks, ranges and other utilities.

A Commodious Kitchen Illustrating the Flexibility of Layout Possible with Curtis Sectional Kitchen Units

Any practical ceiling height may be met. Any horizontal measurement filled to within 2 in. Note alignment of all units with other utilities.

Curtis Units

Dustproof, verminproof construction adds to the utility of Curtis Units. Drawers and doors will not stick. Curtis Units are convenient and easy to use and are built to last a lifetime.

Ironing Board

A convenience appreciated by housewives. Strong, steady — locks rigidly into place. Board shown here installed in door of broom closet unit. Note convenient sleeve board.

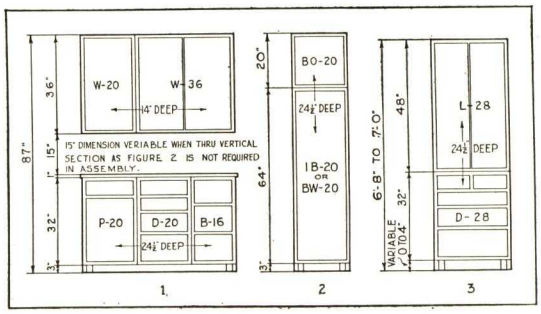
Curtis Kitchen Planning Service Is Used by Architects

This popular service, which has already developed more than 50,000 plans for America's housewives, is at your disposal. Ask your Curtis Dealer (name on request), or write to CURTIS COMPANIES SERVICE BUREAU, Clinton, Iowa, for complete information.

Here Are Some Suggested Uses for Curtis Sectional Units

Home Use

Kitchen Units
Towel Cases
Linen Cases
Chest of Drawers
Wardrobes
Bookcases
Nursery (storage for playthings)
Attic (storage uses)
Sewing Rooms
Laundry (cleaning supplies)
Basement (fruit closets, etc.)

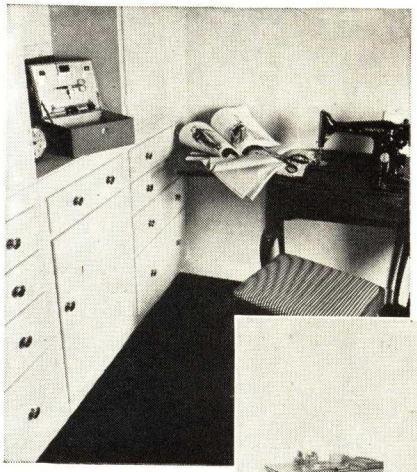


Store Use

Grocery Stores
Meat Markets
Delicatessens

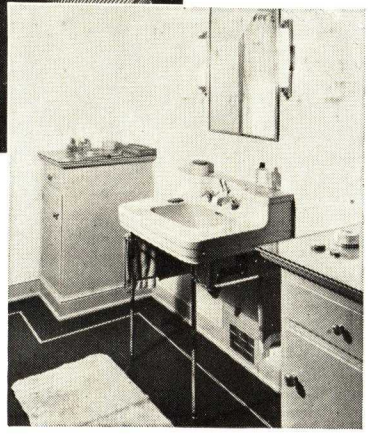
Eating Places

Hotel Kitchens
Restaurants
Lodge Kitchens
Church Kitchens
Railroad Stations
Taverns



Schools

Domestic science rooms
Laboratories
Libraries
Locker rooms
Kitchens
Classrooms (for supplies and books)



Hospitals

Kitchens
Laundry
Operating rooms
Storage rooms
Linen cases
Drawer sections

Construction—Curtis Units embody a new (patented) type of construction that combines lightness with unusual strength. Curtis Units have been dropped from 3-story buildings to pavement without getting out of plumb.

They are true to dimensions and are easily and economically installed. Units bolt together to form rigid permanent assemblies. Front edges of corner posts have a $\frac{5}{32}$-in. radius to form neat finished joints when bolted together. Square corners inside are eliminated, thus facilitating cleaning. Bottoms are strong enough to prevent sagging with loads twice as great as anything ordinarily encountered.

Pan units, fitted with sliding wire shelves, fenced at the back, slide in metal-lined channels. Each unit has been designed in accordance with actual kitchen needs. They are as practical as they are sturdy—and they carry GOOD HOUSEKEEPING'S "Star of Approval."

Curtis Units are carton-packed, and are furnished clean and unmarred. They are finished "in the white" to permit painting in accordance with any decorative scheme.

Made like fine furniture, and offering unlimited flexibility, Curtis Units offer architects a kitchen planning service clients like and appreciate.

Kitchen Planning Demonstration Set

The Curtis dealer has a very interesting and helpful kitchen planning demonstration set. This is being put to marvelous use by many architects in planning kitchens with clients. You may see and use this sales help at the Curtis dealer's office.

Detail Sheets, Catalogs, Samples, Etc.

Complete information, including photographic reproductions of installations, available to architects upon request to any Curtis office. Architects may secure valuable Detail Sheets through the Curtis dealer in the community. (Curtis Woodwork is sold by leading lumber dealers everywhere.) Installations of Curtis Kitchen Units are on display at many of the leading lumber dealers. We shall be glad to furnish the name of the nearest Curtis dealer and any further information desired on Curtis Sectional Kitchen Units and the full line of Curtis Woodwork, including Silentite, the "Insulated Window."

Design the Kitchen "As You Like It"

Thousands of Different Combinations—Large or Small

Illustrated here are the basic Curtis Sectional Kitchen Units. With these you may design any style, any size kitchen you wish—following entirely your own ideas and those of your clients. Fully 1,000 different combinations of units are possible. These are all stock cabinets, available quickly through any dealer in Curtis Woodwork.

The widths of all units are multiples of 4-in. In many instances, 2-in. variations are provided. In combinations, any desired width may be obtained—any practical wall space may be filled.

(1) Over Unit—Used over wall units and over sinks, stoves, refrigerators. 14 in. deep—16 in. high. Eleven widths—12 to 44 in.

(2) Broom Closet Over Unit—24½ in. deep—20 in. high. Six widths—18 to 36 in.

(3) Center Unit—May be used alone, or with utility unit beneath. 14 in. deep—32 in. high. Widths—36 and 44 in.

(4) Wall Unit—Three adjustable shelves. 14 in. deep—36 in. high. Eleven widths—12 to 44 in.

(5) Pan Unit—Has sliding wire shelf. May be had with metal flour bin. 24½ in. deep—32 in. high. Ten widths—16 to 44 in.

(6) Drawer Unit—24½ in. deep—32 in. high. Six widths—16 to 32 in.

(7) Grille Sink Front—22-gauge stamped metal grilles. Two widths—28 and 36 in. Stile may be cut to fit.

(8) Bread Drawer Unit—Three interchangeable drawers—two of non-rusting metal, one of wood. 24½ in. deep—32 in. high. Two widths—16 and 18 in.

(9) Corner Unit—Goes around a corner and conserves space. Made for above and below counter top. Three adjustable shelves.

(10) Over Corner Unit—Goes over corner unit No. 9 when more storage space is desired.

(11) Linen Storage Unit—When placed above drawer units of same width, linen cases are produced. 24½ in. deep, 48 in. high. Two widths—24 and 28 in.

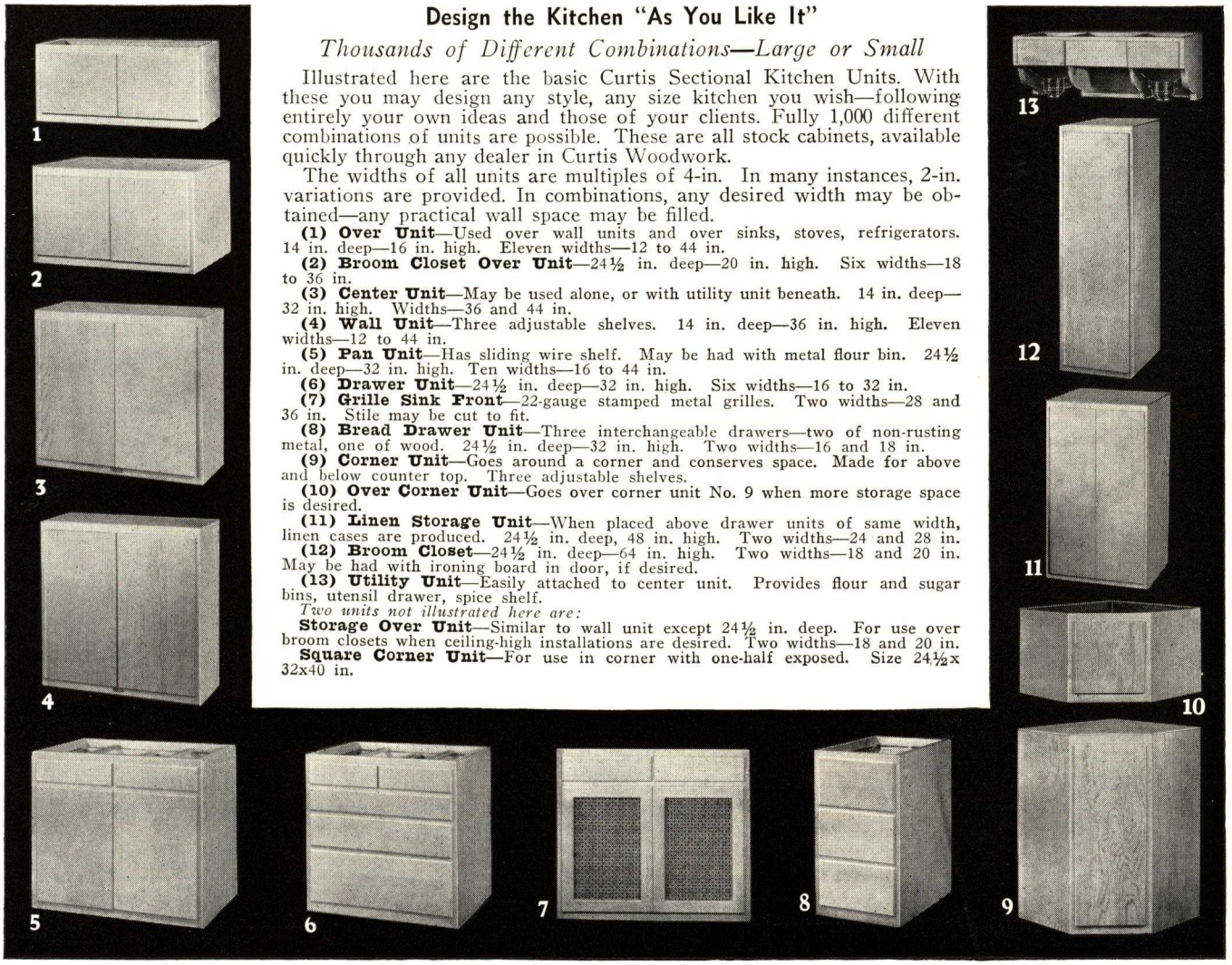
(12) Broom Closet—24½ in. deep—64 in. high. Two widths—18 and 20 in. May be had with ironing board in door, if desired.

(13) Utility Unit—Easily attached to center unit. Provides flour and sugar bins, utensil drawer, spice shelf.

Two units not illustrated here are:

Storage Over Unit—Similar to wall unit except 24½ in. deep. For use over broom closets when ceiling-high installations are desired. Two widths—18 and 20 in.

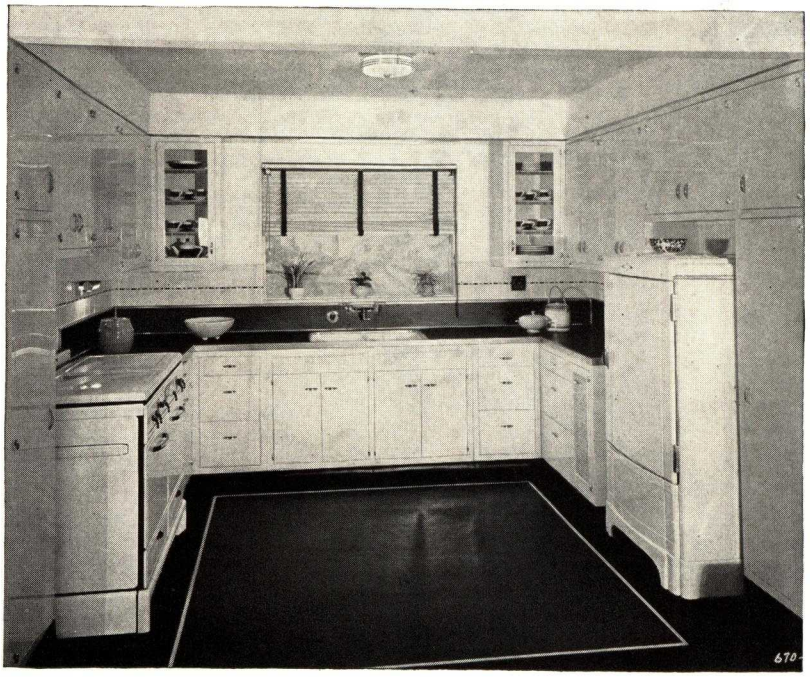
Square Corner Unit—For use in corner with one-half exposed. Size 24½x 32x40 in.



DIETERICH STEEL CABINET CORPORATION

109 North Dearborn Street, CHICAGO, ILLINOIS

Silver Tray



THE POPULAR "U" SHAPED KITCHEN

Vegetable Bin Cabinet

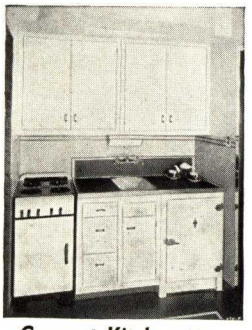
Electric Towel Dryer

Pull Out Slicing Board

Electric Plate Warmer

One Wall Kitchen

Sink and Cabinet Units



Compact Kitchenettes

THE NEW ADVANCED DIETERICH "CUSTOM LINE" STEEL KITCHEN CABINETRY

Embraces every kitchen cabinet and accessory requirement for the home, apartment and institution. Complete information sent upon request.

Specifications

Construction—Dieterich "Custom Line" cabinets are precision constructed of 20 and 18-gauge, No. 1 quality, furniture steel with flush seamless fronts. All cabinets, both wall and base types, are fully enclosed, top, back, sides, and bottom, making them *verminproof*. Drawers and doors are insulated and rubber cushioned, making for quiet operation. All drawers are equipped with ball bearing roller slides. Sliding doors can be had where required.

Finish—All surfaces are sanded, cleaned and coated with high heat primer and finished with three coats of best quality synthetic baked enamel in white, light or dark ivory, or any color to suit the color scheme of the truly modern kitchen.

Modern Hardware—Exclusive, beautifully designed hardware is used on all the doors and drawers. Hinges are forged bronze, olive knuckle type, and door and drawer pulls are cast brass. Hinges and pulls are chrome plated, polished to a mirror finish.

Accessories

A complete line of accessories is available—step-up condiment shelves; containers for bread, pastry, flour, and sugar; cutlery trays and silver trays; tilting container and sifter for flour in wall cabinets; pull-out cutting board in top stile of the base cabinets; towel bars, soap racks; cup hooks; locks for doors and drawers; garbage receptacle and Lumiline built-in cabinet soffit lights, etc.

Special Service Cabinets

A complete line of special service cabinets is available in suitable sizes, including electric plate warmers, electric towel driers, tilting flour and sugar base cabinets, and soiled linen bins, linen drawer chests, serving tray storage cabinets, ventilated fruit and vegetable cabinet; planning desks, ironing board cabinets; and dishwasher cabinets.

Cabinet Tops

Cabinet tops available any size in stainless steel, Monel, linoleum, marble and maple.

Sinks

A complete line in standard and custom sizes, in regular or special shapes, is available in stainless steel or Monel. Linoleum top sink is equipped with stainless steel or acid-resisting porcelain bowls, either single or double.

Kitchen Planning Service

Dieterich Kitchen Engineers render expert kitchen planning service to the architect, builder, and home owner. Each kitchen is dealt with individually and designed to meet the particular needs and requirements of the owner.

Send in your floor plan for layout and estimate. No obligation.

SIZES OF DIETERICH "CUSTOM LINE" STEEL KITCHEN CABINETS

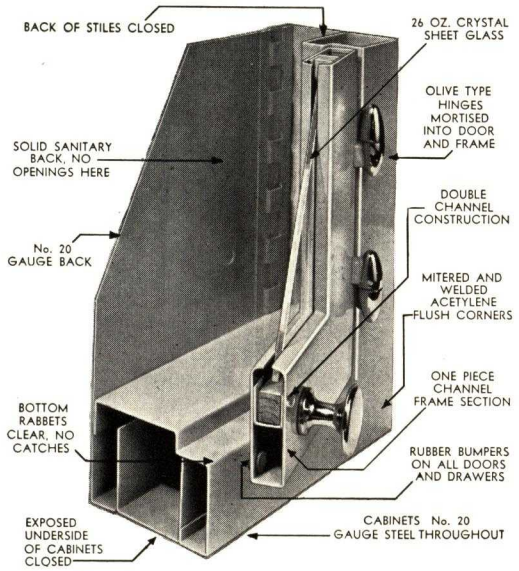
	Wall Cabinet	Base Cabinet	Sink Front	Broom and Dish Cabinet
Wide, in.	15, 18, 21, 24, 30, 36, 42, 48	15, 18, 21, 24, 30, 36, 42, 48	15 to 54	18, 24, 30
High, in.	18, 30, 36, 45, 54	30½*	30½*	80, 86, 95**
Deep, in.	13	21 to 24¾	4-in. flange	13, 24¾

*4-in. sub-base and 1½-in. counter top not included. **4-in. sub-base not included. **In between sizes can be had at price of next larger size.**

EXCEL METAL CABINET CO., INC.

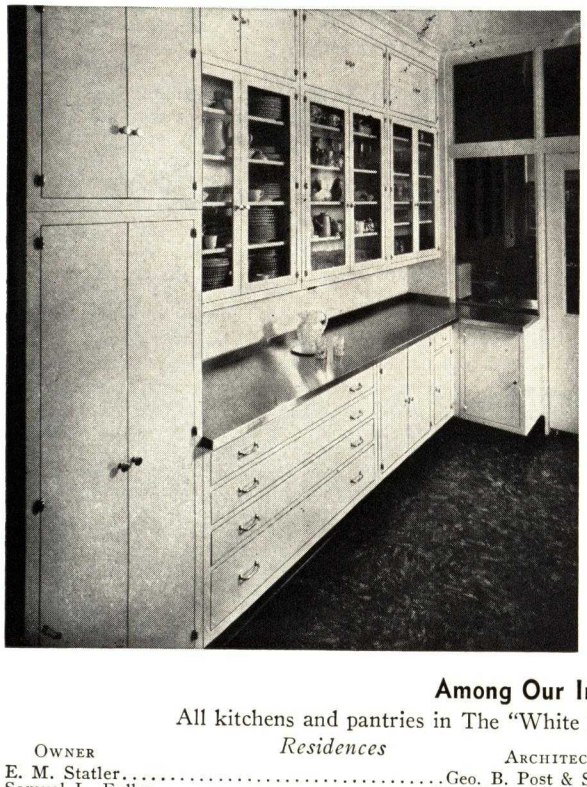
Manufacturers of "Metalcraft" Custom Built Kitchen Cabinets

101 Park Avenue, NEW YORK, N. Y.



Note: Base cabinets have solid closed tops—a complete closed case. Base cabinets have top, bottom and side stiles forming complete rigid front frame. All hardware solid bronze—chromium plated.

All drawers equipped with ball bearing rollers



"METALCRAFT" A QUALITY PRODUCT

For over ten years Metalcraft Cabinets have been installed in some of the finest homes throughout the country.

Today, through specialization, the cost of our cabinets permits their use in the modest as well as in the pretentious residences without any sacrifice in weight of materials or in workmanship.

Metal kitchen cabinets must be rigid and substantially constructed to withstand constant service and abuse. The very purpose of metal—everlasting life—is defeated by light weight and poor construction.

The architect is entitled to and should insist on knowing the gauges of metal and details of construction of kitchen cabinets before specifying and we invite close scrutiny and a careful comparison of our specifications given on this page with others.

Metalcraft Cabinets, because of their greater value to your client, deserve to be included in your specification.

Finish

Metalcraft Cabinets are beautifully finished in special baked-on enamel in any color selected.

Service

We will gladly furnish chart showing all types and sizes of units upon request or our Kitchen Planning Department will submit suggested layout from a floor plan without any obligation.

Specifications

Cabinets to be constructed throughout of 20-gauge metal furniture steel.

All cases to have mitered and acetylene-welded corners forming a rigid front frame, without seams and joints, having top, bottom and two sides. Face to be ground flush and smooth. All frame openings to have full continuous rabbets around top, bottom and sides, connected at corners by welding.

Frame members, and top, bottom and sides of cases to be formed from one sheet of metal. No holes in exposed ends of cases, and no screw heads to show on face or exposed sides.

Between drawers horizontally, and dividing drawers or doors as required, to be box channel members acetylene-welded to frame members forming rabbets, the face of these members flush with face of cabinets.

Underside of upper units to be closed so that bottoms are flush.

Door and drawer heads hollow metal construction 5/8 in. thick, sound deadened inside, to be recessed into rabbeted frames making a flush front. Drawers to be equipped with ball bearing rollers.

Soft white rubber bumpers to be provided behind doors and drawers.

All shelves to be adjustable and removable.

Glazed doors to be constructed of one-piece frame section acetylene-welded at the four corners. Glass removable and secured by flush metal moulding screwed in place on back of door.

Hinges to be cast bronze, semi-concealed olive type chromium plated, and to be carefully mortised into doors and frames. Knobs to be cast bronze—chromium plated.

Counter tops to be constructed of Stainless Steel [Monel Metal] or Linoleum as required.

Metal tops to be constructed of .031 thick Stainless Steel [Monel Metal] stretched over 16-gauge steel body reinforced with heavy channel stiffeners 18 in. on centers.

Linoleum tops to be constructed of 16-gauge steel body upon which is cemented Armstrong's Battleship Linoleum, edges bound with 18-gauge Stainless Steel [Monel Metal] —edge mould rabbeted into linoleum to make a smooth flush surface.

All counters to be turned up at back and sides where against walls.

Finish: all concealed surfaces to have priming coat baked on before fabrication, and all exposed surfaces to be finished with best quality synthetic enamel in accordance with manufacturer's standards.

Among Our Installations Are the Following

All kitchens and pantries in The "White House", Washington, D. C. Lorenzo S. Winslow, Architect.

Residences

Owner	Architect
E. M. Statler	Geo. B. Post & Son, Inc.
Samuel L. Fuller	Peabody, Wilson & Brown
John W. Kiser	Hiss & Weeks
Jacob L. Reiss	Ernest A. Arend
Norma T. Johnson	Goodwillie & Moran
George W. Wedener	Horace Trumbauer
S. A. Kirkman	Ernest Flagg
L. K. Jennings	W. B. Chambers
Edw. H. Wells	Lyon & Taylor
Frederick Rockwell	Taylor & Levi
Gifford Cochran	Albert E. Ives
Frank Jay Gould	A. Kimbel & Son, Inc.
Verner Z. Reed	James MacKenzie
John Sloan	James MacKenzie
Louisa C. Eldredge	Kiehnel & Elliott

Apartments in New York City

720, 740, 780 Park Avenue	Rosario Candela
895 Park Avenue	Sloan & Robertson
76th Street and Madison Avenue	Bien & Prince
15 West 81st Street	Emery Roth
El Dorado Towers	Margon & Holder

ELGIN STOVE & OVEN COMPANY

Manufacturers of Steel Kitchen Cabinets

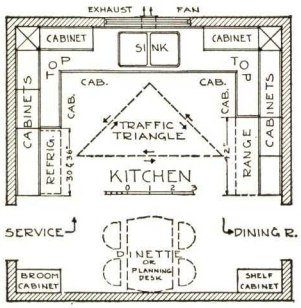
669 North State Street, ELGIN, ILL.

REPRESENTATIVES IN PRINCIPAL CITIES

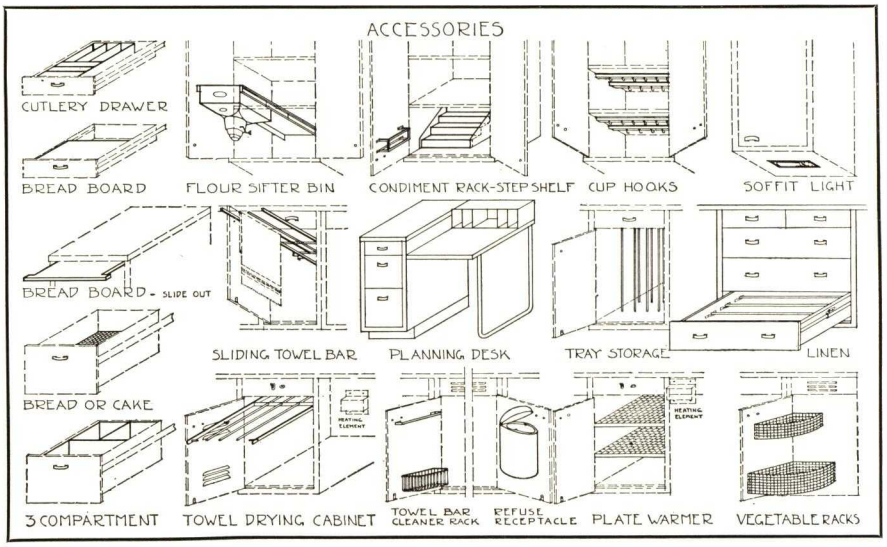
ELGIN STEEL KITCHEN CABINETS FOR RESIDENCES AND APARTMENTS

Wall, base, broom, linen or shelf cabinets, are furnished completely finished ready to set up in conjunction with counter tops, sinks, ranges and refrigerators.

Cabinets standardized to go with the various modern kitchen appliances.



Standard accessories fitting into the cabinets are available to meet the requirements of a modern efficient kitchen.



Century Line and Standard Line Cabinets

Cabinets are made of carefully selected sheet steel, welded construction assuring rigidity, and with all joint connections closed.

Cabinets have insulated door and drawer fronts consisting of two thicknesses of metal separated by noise-absorbing material. All doors and drawers close easily and quietly against rubber cushions.

Cabinets have truss constructed shelves which make them strong and rigid. Shelves in Century Line wall cabinets are adjustable at 1 in. intervals. Standard Line shelves are not adjustable. To eliminate noise, all contacts of shelves to cabinet bodies are against rubber. Shelves may be covered with linoleum if desired.

Cabinets are finished in baked enamel both inside and outside in any of 8 standard colors. Special colors may be furnished at a slight extra cost.

Cabinets are equipped with satin finish chromium plated hardware securely attached to and clear through the door or drawer fronts.

Wall cabinets are hung directly against the walls. They have backs recessed 1 in. for hanging to wood or metal grounds which are applied directly over the wall surface.

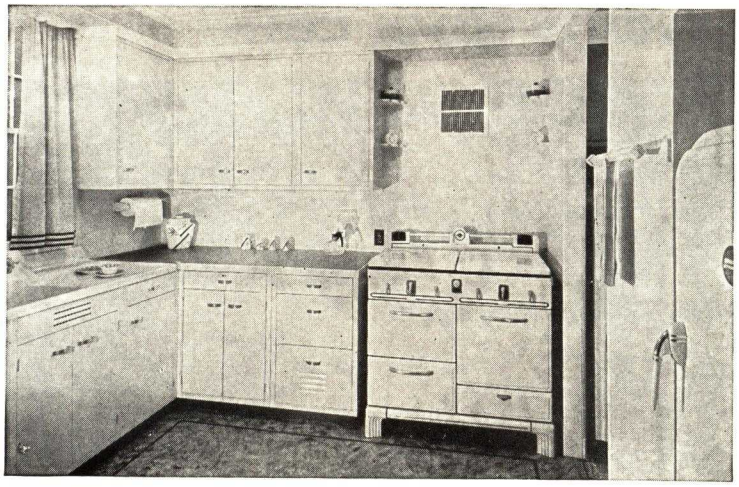
Base cabinets are supported on a 4-in. high or 2½-in. high steel or wood sub-base which is set 3 in. in from the cabinet front to provide toe space at floor level. These sub-bases are enameled, painted, or covered with linoleum.

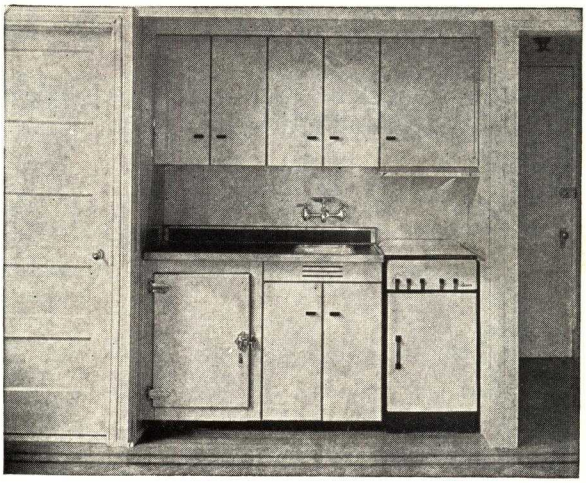
Sinks, Counter Tops, and Appliances

Sinks and counter tops are available in sizes to meet requirements in stainless steel, monel metal, porcelain enamel and linoleum. We, as manufacturers, have co-operated with the manufacturers of counter tops, sinks, refrigerators, dishwashers, gas and electric ranges in designing our cabinets to conform to their sizes.

Planning Service

Plan a complete and efficiently arranged kitchen using Elgin Steel Kitchen Cabinets. Many arrangements are possible using standard units. Our Kitchen Planning Service and local representative will gladly co-operate with you.





CENTURY LINE CABINETS

CENTURY LINE CABINETS SHOW STILES & RAILS

GLASS IN WALL CABINET DOORS IF DESIRED

18"
30"
36"

15" 18" 21" 24" 30" 36"

WALL CABINETS

30½"

15" 18" 21" 24" 30" 36"

BASE CABINETS

2 DRAWER PULLS

30½"

15" 18" 21" 24" 30" 36"

BASE CABINETS

2 DRAWER PULLS

30½"

18" 21" 24" 30" 36"

SINK FRONTS

18" UP, ALSO WITH BOTTOMS

62"

18" 24"

BROOM & OR SHELF CABINETS

PLASTER

24¾" CENTURY LINE
21" STANDARD LINE

13"

30" HIGH WALL CABINETS

18" MINIMUM

1½"

3"

4" CENTURY LINE
2½" STANDARD LINE

STANDARD LINE CABINETS

STANDARD LINE CABINETS SLAB FRONTS

GLASS IN WALL CABINET DOORS IF DESIRED

18"
28"

15" 18" 21" 24" 30" 36"

WALL CABINETS

32¼"

15" 18" 21" 24" 30" 36"

BASE CABINETS

18"

BASE CABINET

18" 61½"

18" 18"

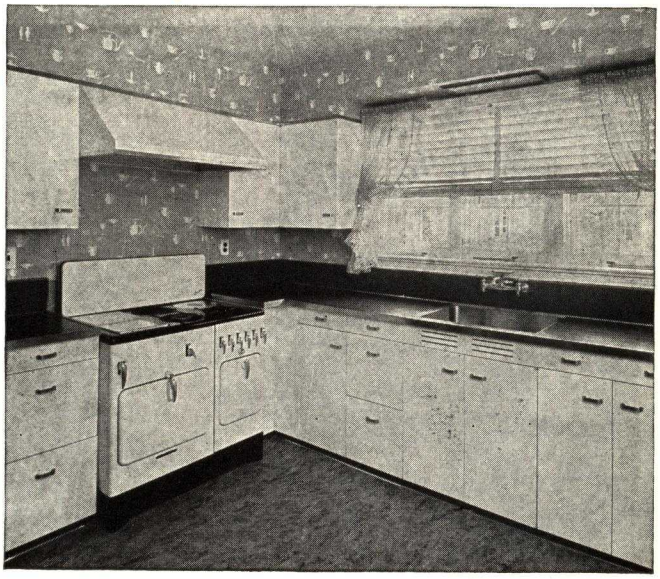
BROOM SHELF CABINETS

32¼"

15" 18" 21" 24" 30" 36"

SINK FRONTS

18" UP, ALSO WITH BOTTOMS



FARLEY & LOETSCHER MFG. CO.

DUBUQUE, IOWA

For "Unipak" Wood Casements, Double Hung Windows and Disappearing Stairways, see File Index.

Sash, Doors, Blinds, Frames, Screens, Mouldings, Storm Sash, Cabinet Work, Stair Work, Porch Work, Interior Trim, Veneered Doors, Combination Doors, Garage Doors, Stock and Special Millwork.

F & L "DE LUXE" KITCHEN UNITS

A complete line of high grade Wood Cabinets designed for new efficiency, maximum flexibility and to harmonize with the modern type ranges, refrigerators and other kitchen equipment.

Qualitybilt WOODWORK REGISTERED

Available in the following methods of shipment:

1. Semi-assembled, not painted, carton packed.
2. Set Up, not painted, crated.
3. Set Up, primed, crated.
4. Set Up, completely enameled, crated.

GENERAL SPECIFICATIONS

How Shipped

F & L "De Luxe" units are shipped complete including ends, tops, bottoms, shelves, hardware and backs—except backs are not included with semi-assembled units unless ordered.

Material

All units are made from thoroughly kiln dried and seasoned W.P. Pine, selected for grain and color (except hardwood drawer slides, doors, backs and counter tops). Other woods furnished when desired.

Doors are flush type, 1⅛ in. thick with standard lipped construction. 5-ply, cross banded, with close grained hardwood face veneers suitable for enamel finish. One-panel doors (with hardwood panel) or sash doors furnished when ordered.

Drawers are made with dovetailed construction and lipped fronts. 3-ply bottoms are set in grooves in front, sides and back. 2-piece hardwood center guides furnished to insure easy operation. Tilting strips included to prevent drawers from tilting.

Ends and shelves are made from ¾-in. materials, pieces glued together to resist warping. Shelves are adjustable.

Backs are 3-ply with hardwood face veneer suitable for enamel finish.

Finishes

F & L "De Luxe" Kitchen Units can be furnished in the white (not painted) or can be completely finished in beautiful enamel combinations at the factory. Enamel finish consists of a special semi-gloss, clear toned, synthetic enamel, having strong moisture and alkali resisting properties and producing a fine surface resistance. Other type finishes furnished when desired.

Hardware

Specially designed hardware is included with all "De Luxe" units. Consists of semi-concealed chrome-plated hinges, chrome-plated door catches, chrome-plated drawer pulls and cadmium-plated elbow catches. Shelf pins included for adjustable shelves.

Counter Tops

Flat tops furnished in W.P. Pine, Unselected Birch, Maple, Linoleums, Porcelain Enamel, Stainless Steel or Monel Metal.

Tracy Imperial linoleum, Tracy De Luxe linoleum, Tracy Silvi Sheen stainless steel and Veribrite acid-resisting porcelain enamel sink tops furnished in all sizes and shapes.

Metal Food Containers

A large variety of metal food containers are available when desired. The material used will not contaminate food and will not crack or peel.

Packing

All units are especially well crated for shipment so they will reach their destination in first-class condition.

Special Cabinets

Although the standard F & L "De Luxe" Kitchen Units meet the majority of requirements, our factory is fully equipped to produce cabinets of special sizes, special construction and in various woods.

Standard or special cabinets can be made to fit in installations where electric dishwashers are used or where special sinks are installed.

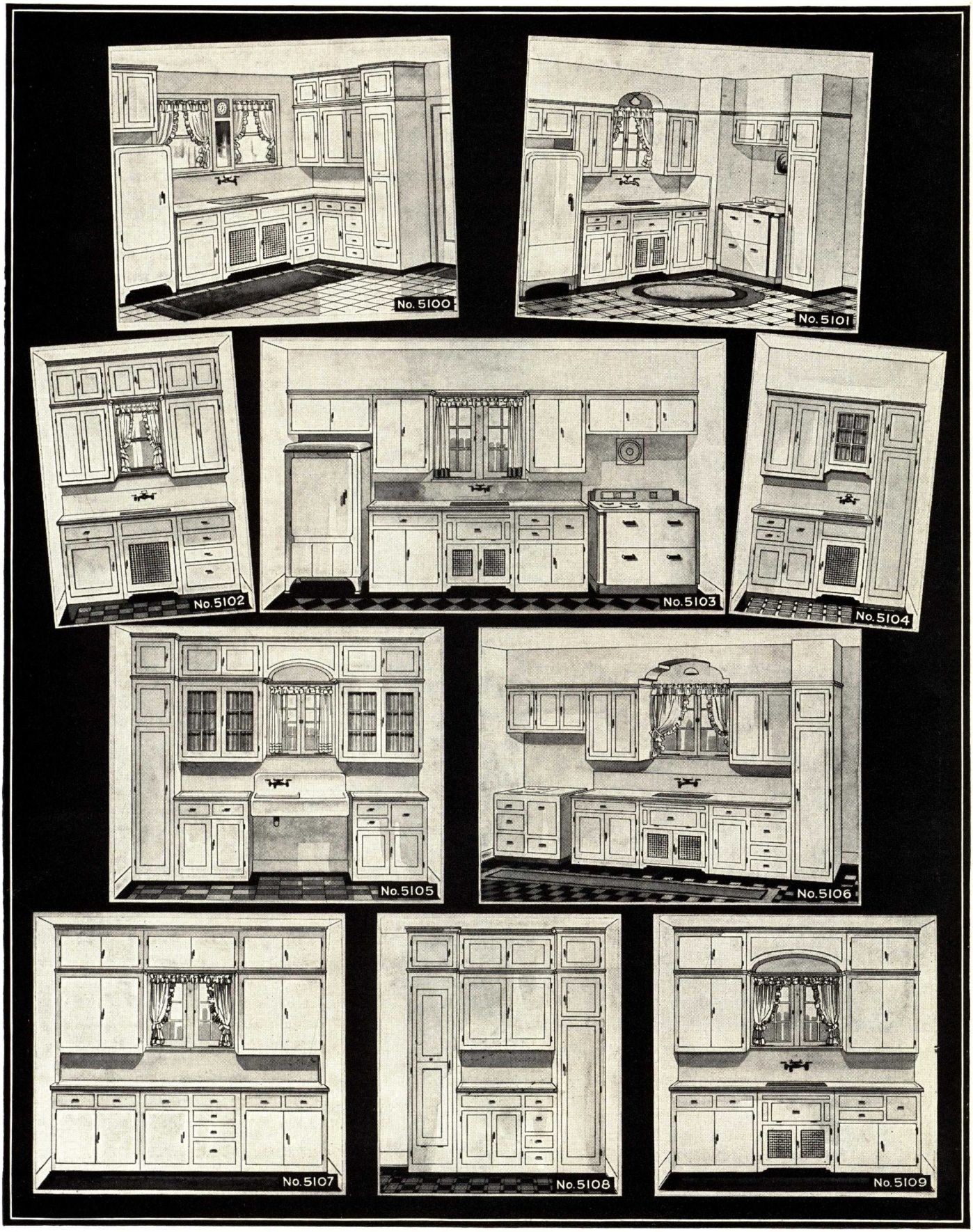
Our Kitchen Planning Department offers a complete service on kitchen planning and is prepared to suggest the latest and best kitchen equipment at the most economical cost.

Established 1875

Over 21 Acres of Floor Space

THE HOME OF "DE LUXE" KITCHEN UNITS

A GROUP OF SUGGESTED F & L "DE LUXE" KITCHEN INSTALLATIONS



HYGRADE KITCHEN CABINET CO., INC.

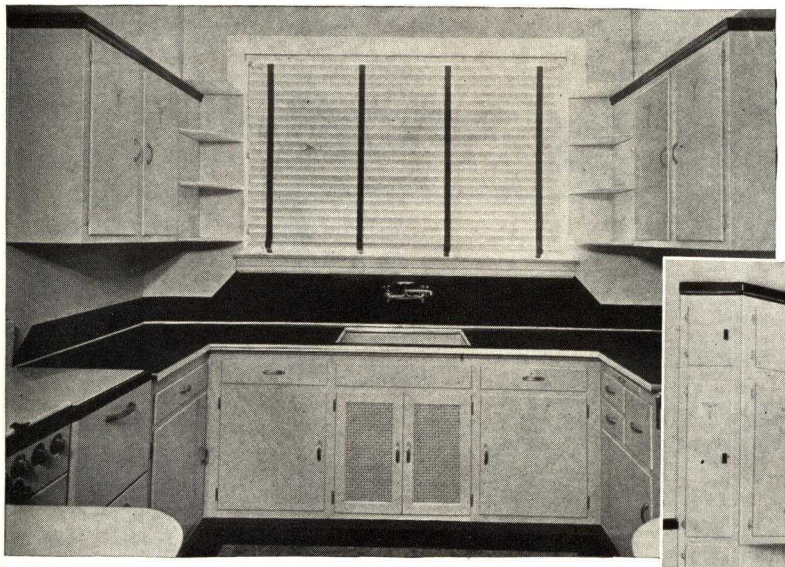
TELEPHONE
EVergreen 7-4760-1

FACTORY AND SHOWROOM
341-9 Scholes Street
BROOKLYN, N. Y.

HYGRADE "DE LUXE" KITCHEN CABINETS

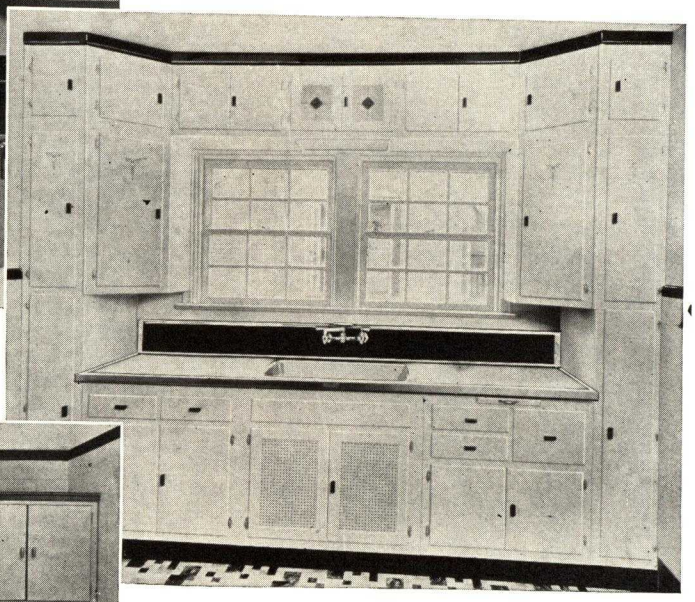
Hygrade "De Luxe" Kitchen Cabinets represent the latest achievement in kitchen cabinet design. They are carefully planned and made to provide maximum utility, beauty and durability. Standard units are designed with bottoms of bases set back and kick-plates recessed to allow foot space in front of all cabinets. Special equipment includes sliding table, removable chairs, flour and sugar bins, midget radio compartment, aerated vegetable bin, linen hamper, towel racks, soap trays, and wire rack covers.

All Hygrade Units can be finished in any color or color combination desired. Construction features are briefly outlined below. Hygrade Sectional Cabinets can be adapted to any kitchen—whether large or small—or, if desired, be custom-built to meet special requirements. We will be glad to consult with architects and others regarding the designing of kitchens without any obligation.



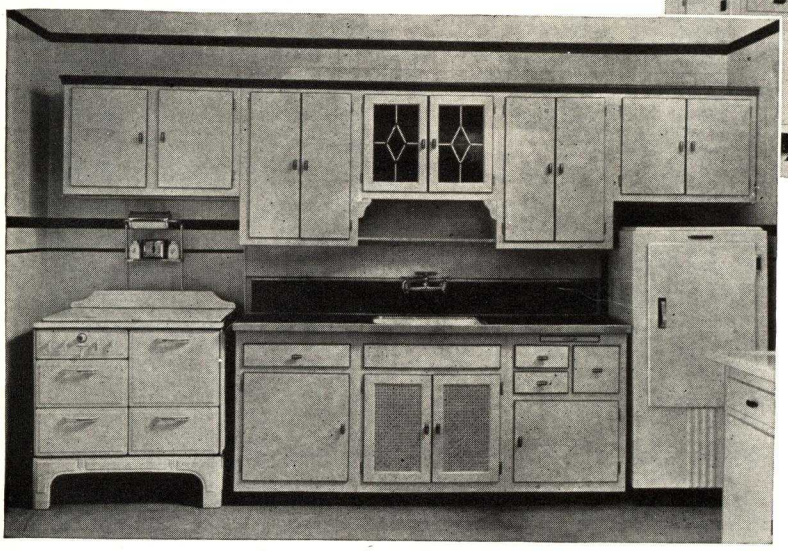
A U-Shaped Hygrade Kitchen Unit

This attractive Hygrade unit was designed by our architectural staff to fit job conditions. It can be re-arranged to meet other requirements.



A Hygrade Kitchen Unit With Concealed Lighting

Above: In this unique arrangement every available inch of space is used to best advantage. Appearance and utility are enhanced by novel concealed lighting arrangements in upper cabinets.



A Typical Grouping for Maximum Efficiency

Left: In this Hygrade assembly the fundamental kitchen units—range, sink and refrigerator are placed on one side of the wall—a compact, convenient arrangement.

CONSTRUCTION FEATURES OF HYGRADE DE LUXE KITCHEN CABINETS

Materials and General Construction — Selected hardwood thoroughly seasoned and kiln-dried to within 5% moisture content. All front frames are mortised and tenoned and glued with high quality glue. Shelves are dadoed into sides. All materials used in construction are of highest quality.

Doors—Doors are made in either a flush or paneled design. Flush doors are made of 5-ply laminated wood, 13/16 in. thick, with hardwood cores and cross binders to prevent warping. In the paneled design, the stiles and rails are made with mortise and long tenon construction; the panels are made of 3-ply laminated wood.

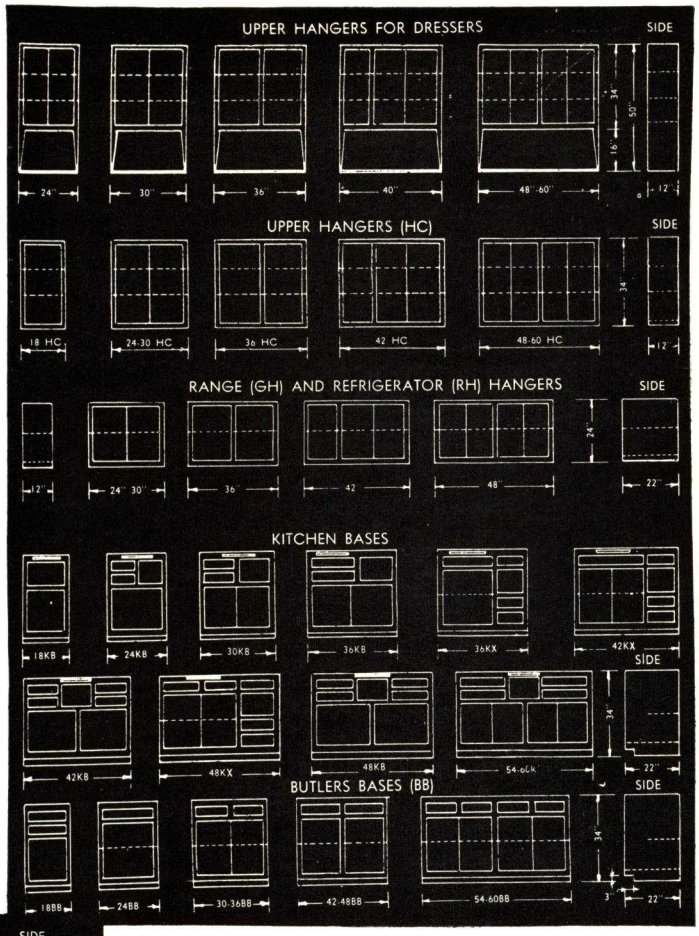
Back and Drawer Bottoms—Made of ¼-in. 3-ply wood or ¼-in. Prestwood.

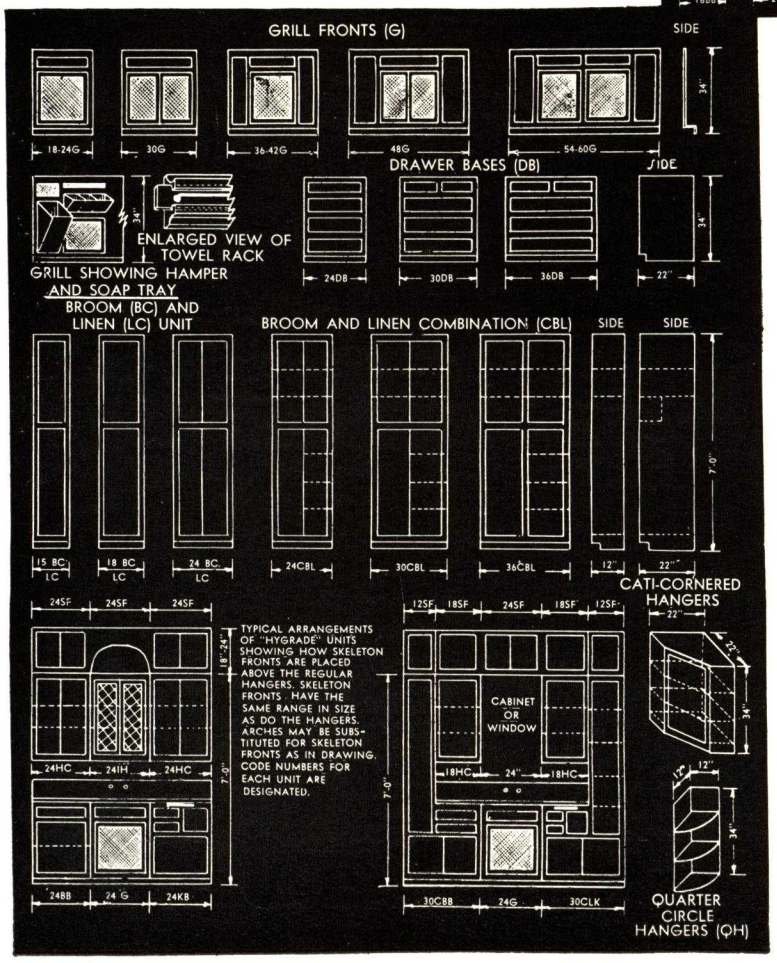
Drawers—Perfect freedom of operation. The drawer interiors are carefully sanded and finished in red mahogany. The bread-box is made of heavy rustproof metal with sliding lid. All drawers are of dovetail construction.

Finish—Satin smooth 4-coat finish in any color or color combination desired. Carefully hand sanded between coats. Application is with air spray guns, and cabinets are dried in automatically heat-controlled rooms to insure a perfect and lasting finish —strikingly beautiful.

Hardware—A choice of rustproof, chrome plated or catalin latches in ultra modern design. Semi-concealed hinges in bright or French satin finish.

An Attractive "L" Shaped Hygrade Kitchen Unit



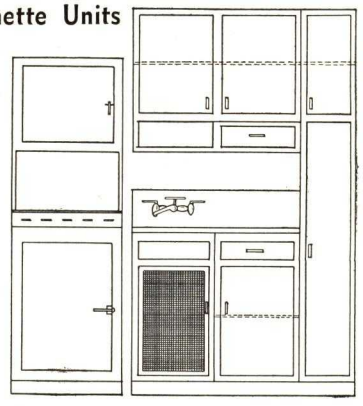


Hygrade Sectional Cabinets

May be adapted to fit space requirements and, if necessary, custom-built to fill any need or specification at an unusually low cost.

Hygrade Kitchenette Units

Attractive units that provide ample room for work and storage, electric refrigerator, porcelain sink and top combination and gas range—in a minimum of floor space. Adaptable for old as well as new apartments.



Hygrade "Mirrolite" Sink and Cabinet Tops

Moderately priced, beautiful in appearance, acidproof, stainless and heat-resistant making the working surface suitable for unusually hard service. With or without back and end splashers—any size required. We also furnish sink and counter tops in stainless steel or monel, seamless acid-resisting porcelain on steel or cast iron, linoleum, or Masonite Prestwood in a choice of colors.

Hygrade "Mirrolite" Sink

ESTABLISHED 1840

JANES & KIRTLAND, INC.

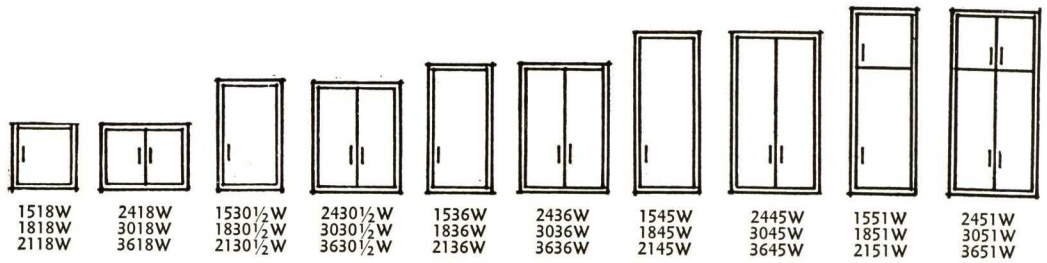
Manufacturers of Sectional Steel Units for Kitchen and Pantry

MAIN OFFICE AND SHOWROOM

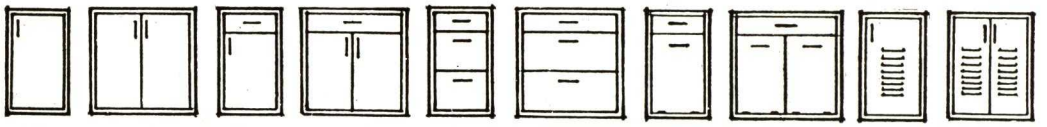
101 Park Avenue, NEW YORK, N. Y.

The WHITE HOUSE Line
TRADE MARK

WHITE HOUSE steel units have been on the market for twenty-five years. Each year some improvement is made in design or construction, so that when you buy WHITE HOUSE units you are assured of the most modern equipment for your kitchen and pantry.



1518W 1818W 2118W | 2418W 3018W 3618W | 15301/2W 18301/2W 21301/2W | 24301/2W 30301/2W 36301/2W | 1536W 1836W 2136W | 2436W 3036W 3636W | 1545W 1845W 2145W | 2445W 3045W 3645W | 1551W 1851W 2151W | 2451W 3051W 3651W



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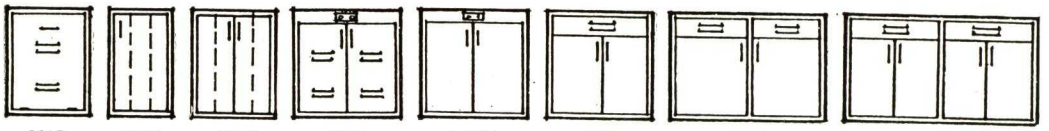
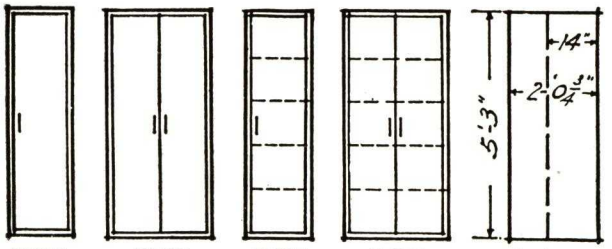
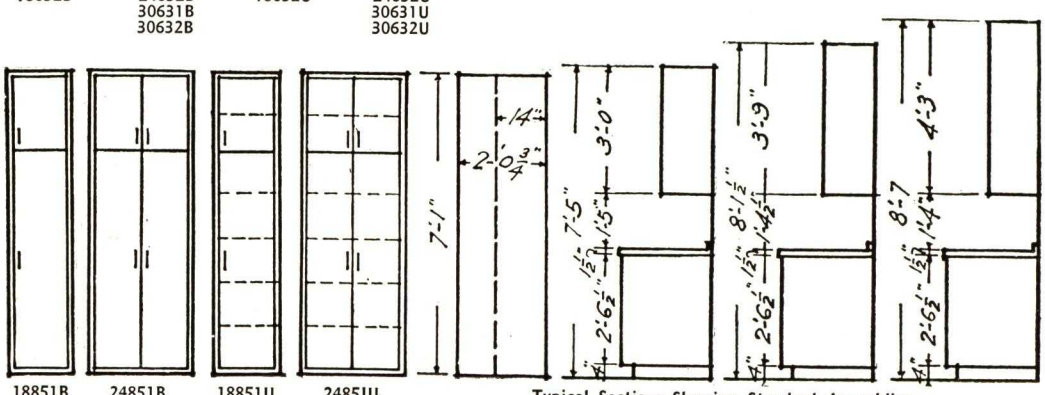


18LB 24LB | 15TB 18TB | 24TB 30TB | 24TD 30TD | 24PW 30PW | 24SF 30SF 36SF | 44SF | 54SF



18631B 18632B | 24631B 24632B 30631B 30632B | 18631U 18632U | 24631U 24632U 30631U 30632U | Section

AC—All Cupboard
CD—Cupboard and Drawer
AD—All Drawers
TB—Tray Base
LB—Linen Bin
VB—Vegetable Bin
FB—Flour Bin
TD—Towel Dryer
PW—Plate Warmer
SF—Sink Front



18851B 18852B | 24851B 24852B 30851B 30852B | 18851U 18852U | 24851U 24852U 30851U 30852U | Typical Sections Showing Standard Assemblies

Wall Units

All wall units are made 14 in. deep over all, giving a 13¼-in. clear shelf space inside.

Doors may be metal or glazed as required with the exception that the 18-in. high units are furnished with metal doors only. Modern handles are placed at conveniently located heights.

Base Units

Base or lower units are made 24¾ in. deep standard. Other depths, however, may be furnished but at extra cost.

A four or five drawer base may be substituted for the three drawers at extra cost. Suspension slides on all drawers.

Frames and doors are in sizes as shown or special widths if required with louvre panel and doors, or grille doors for radiator enclosures.

Rods for towels and rack shelf may be furnished on the inside of doors of any frame.

All base units rest on 4-in. sub-base set back in front 3 in. for toe space. These sub-bases may be of concrete, tile or wood and are usually furnished by another contractor.

Closets

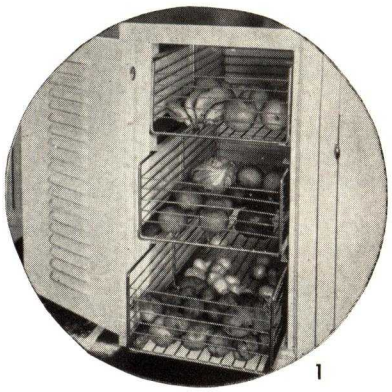
Closets are made 14 in. deep to match wall units or 24¾ in. deep to match base units.

Closets are equipped with hooks and clips for brooms and mops or provided with four steel shelves for general storage or five wire racks for pot and pan storage.

To obtain height of closet to match total over-all height of upper units, place wall unit on top of closet.

Other accessories available are locks, reflectors, cup hooks, platter rails, flour bin and sifter for upper units, sugar jars, spice jar racks, and rolling ladder and rails for reaching high upper units.

THESE WHITE HOUSE FEATURES MAKE A COMPLETE, CONVENIENT AND SERVICEABLE LAYOUT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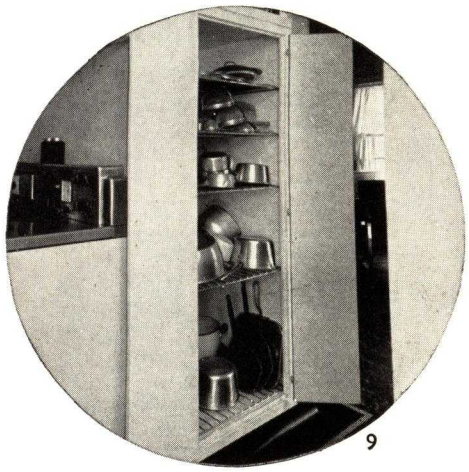
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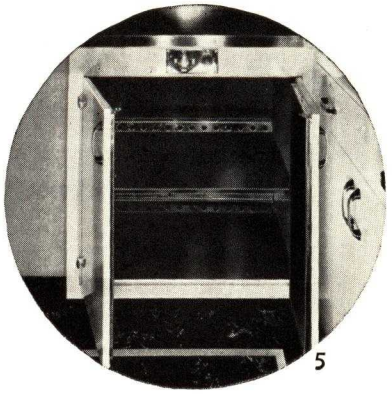
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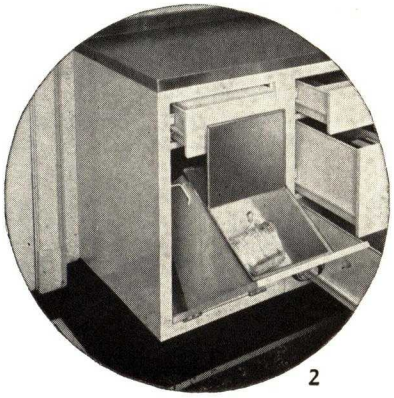
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(1) Vegetable base with sliding wire baskets.

(2) Flour bin base—removable tilting bins for flour and sugar.

(3) Tray base with removable wire rack partitions for trays and platters.

(4) Soiled linen bin for pantry service.

(5) Electric plate warmer with three-heat switch and pilot light.

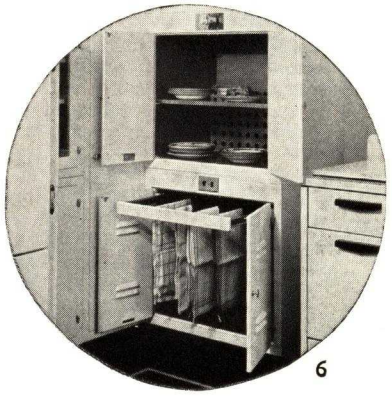
(6) Electric plate warmer and towel dryer installation, using plate warmer at counter height for convenience.

(7) Silver drawer, felt lined and provided with sliding tray and adjustable partitions.

(8) Cutlery drawer with linoleum on bottom and adjustable partitions; sliding bread board.

(9) Pot closet with heavy wire racks for pots and pans.

(10) Wire racks in an all cupboard base for pots and pans; removable flour bin and sifter in wall unit; removable bread tin.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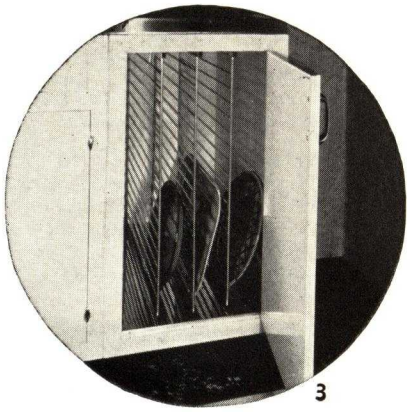
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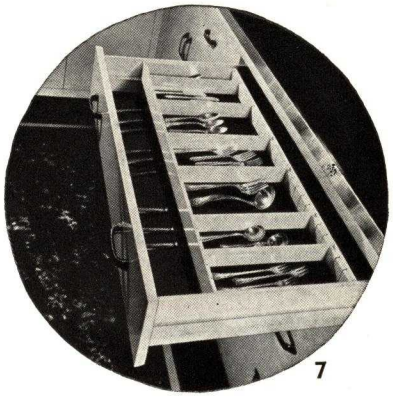
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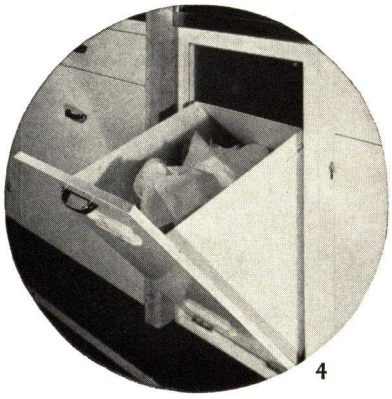
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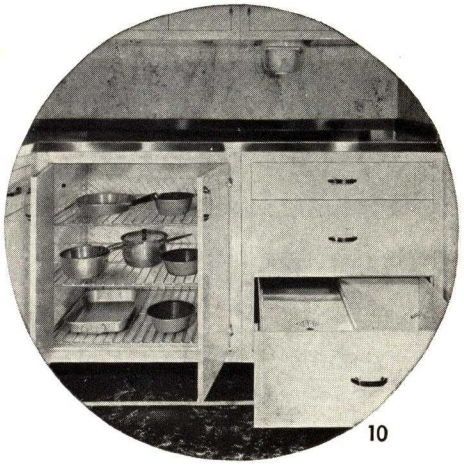
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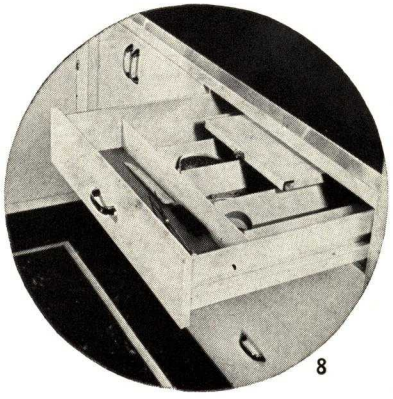

8

Wherever food is stored, prepared or served—use steel

THE KITCHEN MAID CORPORATION

ANDREWS, INDIANA

AGENTS

ATLANTA, GA., Dixie Kitchen Maid Sales, 1325 William St., Oliver Bldg.
BOSTON, MASS., Eames Co., 859 Boyleston St.
BUFFALO, N. Y., Dohn, Fischer & Co., Inc., 1330-1348 Niagara St.
CHICAGO, ILL., Kitchen Maid Co. of Ill., 2820 South Parkway
CINCINNATI, OHIO, H. H. Fikret, 127 E. Ninth St.
CLEVELAND, OHIO, Porter Building Equipment Co., 3219 Carnegie Ave.
DALLAS, TEX., United Builders Equipment Co., 2nd Unit Santa Fe Bldg.
LOUISVILLE, KY., Henry Koehler & Co., 15th and Oak Sts.
MIAMI, FLA., F. C. Jack, 206 N. E. 14th St.
MILWAUKEE, WIS., Kitchen Maid Sales & Supply Co., 4121 W. North Ave.
NEW YORK, N. Y., Kitchen Maid Sales Co., 101 Park Ave.
PHILADELPHIA, PA., Philadelphia Gas Range Co., 1117 Chestnut St.
PITTSBURGH, PA., L. A. Rust, 141 Gulf Bldg.
RICHMOND, VA., Kolbe, Inc., 5 W. Grace St.
ST. LOUIS, MO., Frank J. Felker, 3550 Pine Grove Ave.
WASHINGTON, D. C., Reid S. Baker & Sons, Inc., 805 Vermont Ave.

Consult the phone book for agents in other cities—or write Andrews, Indiana

PRODUCTS

BUILT-IN KITCHEN CABINET UNITS OF WOOD CONSTRUCTION, in a variety of standard sizes, for every kitchen need. Also continuous Sink and Counter Tops, specially fabricated in materials specified by the architect, for installation with standard units. All units are factory built and finished, shipped ready for installation.

KITCHEN MAID
ORIGINATOR OF STANDARD UNIT KITCHEN CABINETRY

MATERIALS AND CONSTRUCTION

Kitchen Maid units are built of clear, sound hardwood, and other time-tested materials. Because of their wood construction they have a warmth, beauty and adaptability not available in other types of standard cabinets. All lumber is properly seasoned. Workmanship is critically inspected; methods are based on over 14 years' experience in standard unit kitchen cabinetry. Sturdy ¾ in. thick frames and ends.

Frame joints are full mortised and tenoned. Corners are triple-nail-locked. Rigid plywood shelves (⅛ inch, 5-ply) are dadoed and securely glued into ends. *Prestwood backs* are rabbeted into top, bottom and ends, with rubbed glue joint wood blocks in all base corners. This construction plus triple-coat finish effectively seals each unit and each shelf—for cleanliness and to keep out vermin.

All interior corners are rounded—as easy to clean as the inside of a cup. *5-ply lumber-core doors* are guaranteed against warping—smooth surface, flush-panels, rounded corners.

Steel drawers slide on hardwood guides, for smooth dependable action. No sticking, no binding. Baked enamel finish. ¾-in. lumber drawer fronts. Self-closing bread box.

Highest quality chrome-plated hardware. Catches and drawer pulls are easy-acting and durable; large enough for full grip. Hinges are semi-concealed to eliminate dust-catching corners.

COLORS AND FINISH

Kitchen Maid units are furnished in a choice of 12 standard colors. Special colors extra. Doors and drawer fronts striped or lined with contrasting color or interiors in contrasting color when specified at small additional cost. No decoration unless specified.

Standard colors (samples on request):

Shasta White	Palmetto Green
Dawn Gray	Pastel Green
Powder Blue	Pearl Glow
Sunbronze Tan	Colonial Ivory
Ceramic Yellow	Paint Ivory
Sprint Green	Travertine Ivory

INSTALLATION

Kitchen Maid units are installed on the job by the general contractor. Pre-bored holes are provided in the integral nailing strips for screwing or toggle-bolting to wall; in sides for screwing units together.

MODERATE COST

Standardization and years of production experience enable Kitchen Maid to furnish this modern Kitchen Cabinetry at a worthwhile saving as compared with special work.

FLEXIBILITY

Kitchen Maid units come in sufficient variety of sizes to make the combination of units for any kitchen an easy matter. Additional flexibility may be gained laterally by trimming down certain units, or by the use of mouldings at the wall. Vertically, the space above wall units is usually taken care of by the use of a false wall.

MODERN SIMPLICITY

Today's Kitchen Maid Cabinetry is designed for convenience and cleanliness; to harmonize with the newest kitchen appliances. Smooth, durable finish, appealing color, flush panels, unobtrusive hardware, and simple lines make it truly modern.

FREE PLANNING SERVICE

Consider the Kitchen Maid Planning Service as part of your staff—draftsmen who specialize in kitchen problems exclusively. Send data on sizes and openings for suggestions on the adaptation of Kitchen Maid units to your plan. No obligation.

THE ORIGINAL STANDARD UNIT SYSTEM

Standard Unit Kitchen Cabinetry was first developed by Kitchen Maid in 1922. It has been used in thousands of fine homes and apartments with the most satisfactory results. Countless improvements and additions have been made as the result of wide experience, so that Kitchen Maid offers today a complete and thoroughly dependable line.

check these KITCHEN MAID advantages:

MODERN SIMPLICITY

DURABLE FACTORY FINISH

STURDY WOOD CONSTRUCTION

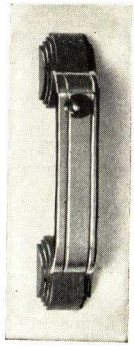
WIDE RANGE OF UNITS

SANITARY—EACH UNIT SEALED

GREATER FLEXIBILITY

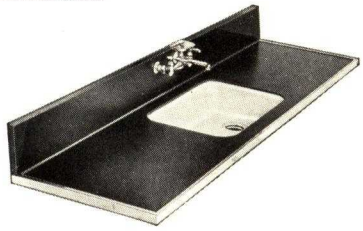
EASY INSTALLATION

WORTHWHILE SAVINGS



Attractive Hardware

Chromium plated Kitchen Maid hardware is decidedly trim and modern in appearance—designed for beauty and utility. Catches and drawer pulls furnish an easy grip and are equipped with colorful plastic bases in choice of Red, Black, Brown or Ivory. Hinges are semi-concealed—hardly noticeable.



Temperprest Counter Tops

Temperprest tops, developed by Kitchen Maid, are recommended for all-around utility and economy. They possess many superior characteristics, yet may be had at a substantial saving over other types of top materials.

Materials—Temperprest is all-wood, highly compressed and sealed with own resins; then chemically treated to resist moisture, grease, and acids. Surface is non-chipping, resilient, noiseless, absolutely impervious to water and other liquids, not easily spotted by grease, marred or dented, not damaged by hot vessels, not easily stained or spotted by milk, vinegar, fruit juices, or alcohol. Will not warp, split, chip, or craze. Outlets may be cut on the job.

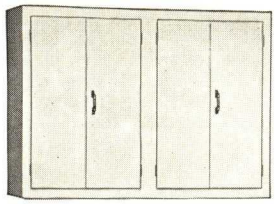
Construction—$\frac{5}{16}$-in. Temperprest is securely applied with waterproof glue to 5-ply plywood, reinforced around sink opening with lead dowels, anchored into Temperprest top. Edges are finished with stainless steel.

Sizes—Temperprest tops are available in any size up to 12 ft. in length. Backsplash may be any desired height.

Colors—Available in choice of 5 colors: Brick Red, Persian Brown, Russet Brown, Mottled Green, or Jet Black.

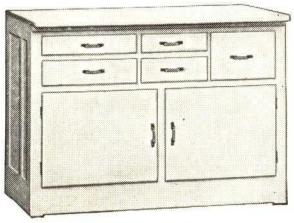
Typical Convenience Units (Below)

Many points of superiority make Kitchen Maid Cabinetry best suited for the modern kitchen. One of the most important to the housewife, and thus to architect and builder, is the abundance of useful Convenience Units which make planning an efficient kitchen an easy matter. Illustrated below: (Left to right) Linen Storage Drawers, Inside Corner Shelf Unit, Towel Dryer Rack, Soiled Linen Bin, Open Corner Base, Utility Bin, Beverage Base (No. ML2224), Tray Storage Base.



Wall Cupboard No. M-9254

See details for sizes and complete list of units.

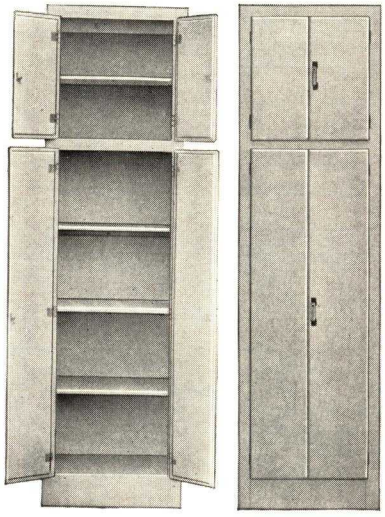


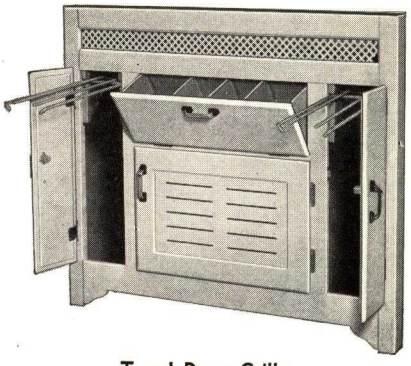
Cabinet Base No. M-1248

Wall Cupboards and Cabinet Bases come in various sizes up to 48 in. in width. See details on page 3.

Package Unit No. NW-3596

Package Units are specially priced combinations of butlery base, sink front, cabinet base and sink top. Illustration shows assembly with wall cupboards above. See page 4.



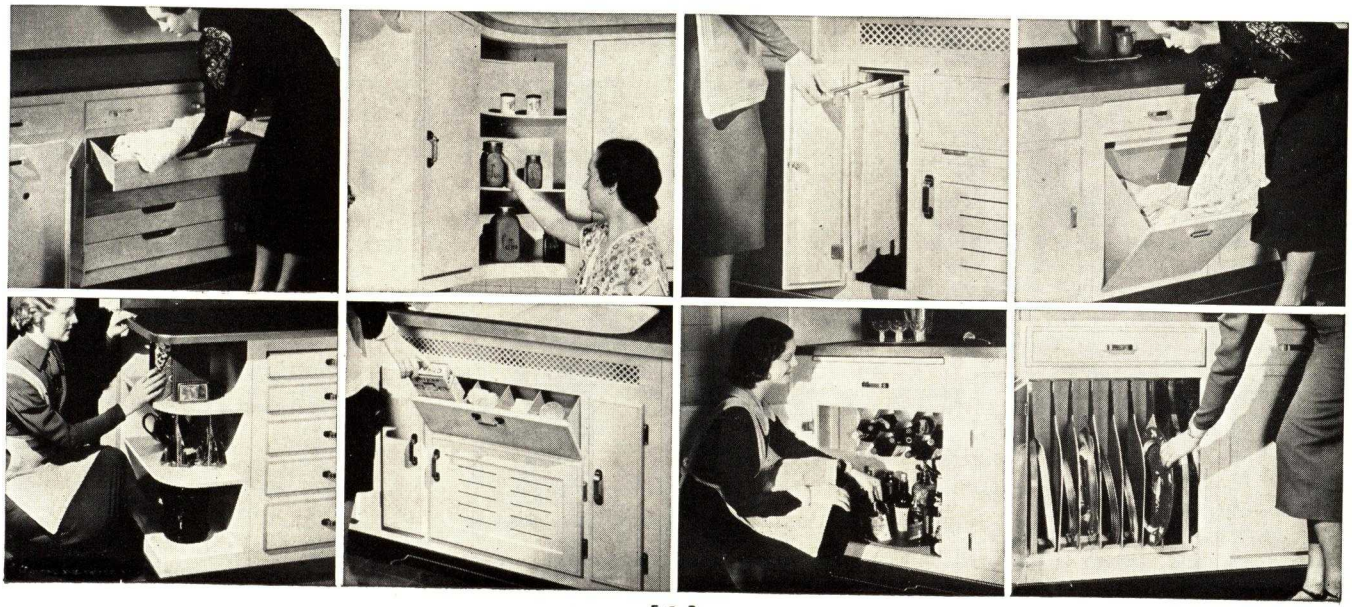


Towel Dryer Grille

For use under sink. Includes access door, removable tilting bin for storage of soap and sink supplies, and sliding, rustproof towel racks. Compartments fully ventilated.

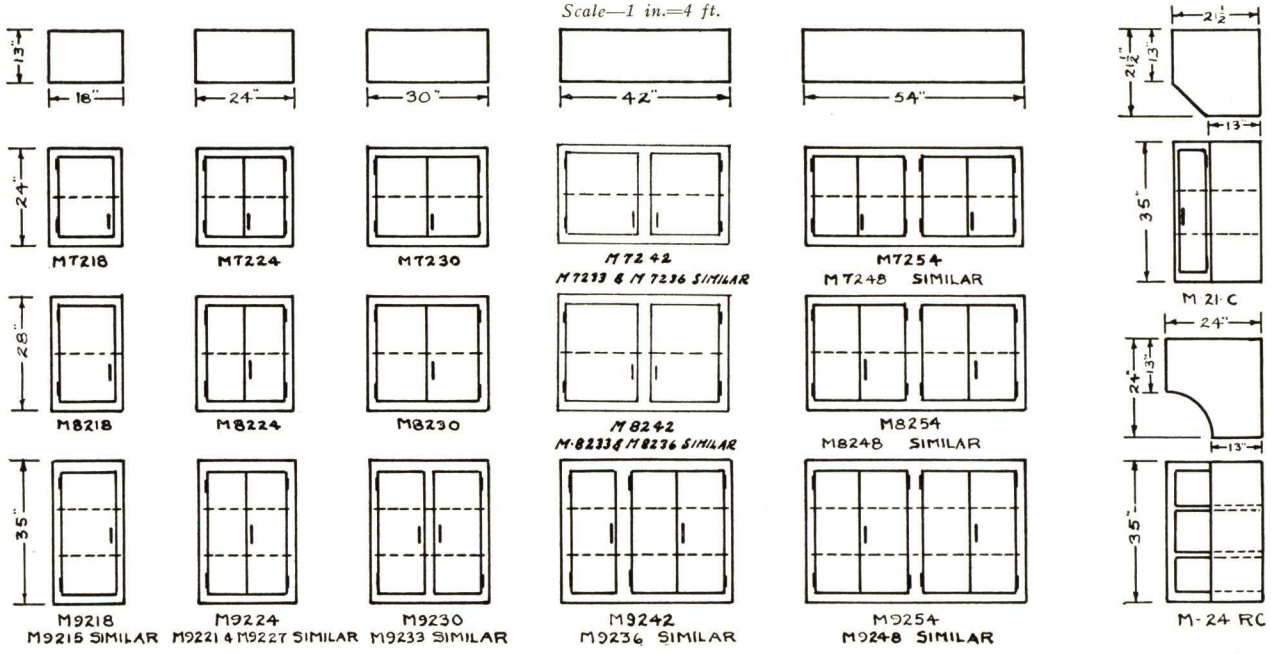
Dish Cupboard No. M-5224-S

Typical of the side units or utility cupboards; with shelves for dishes, pots, pans, linen, etc., without shelves in lower part for brooms and mops.



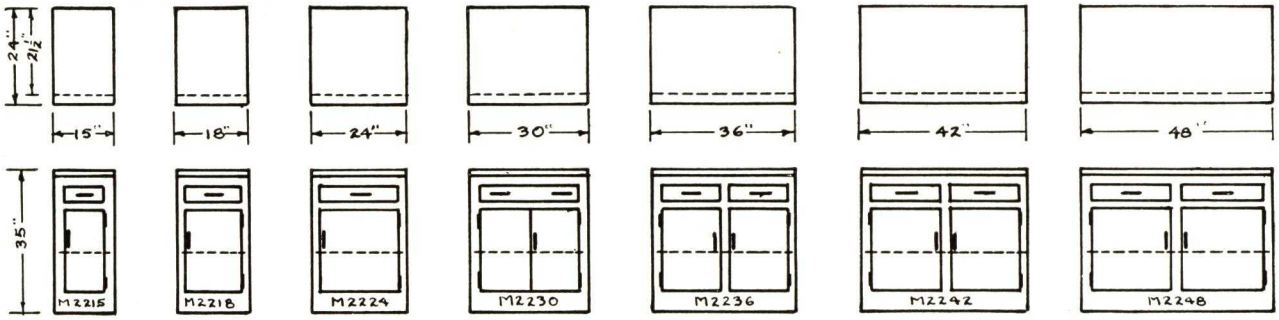
STANDARD KITCHEN MAID UNITS FOR MODERN KITCHENS

Scale—1 in.=4 ft.



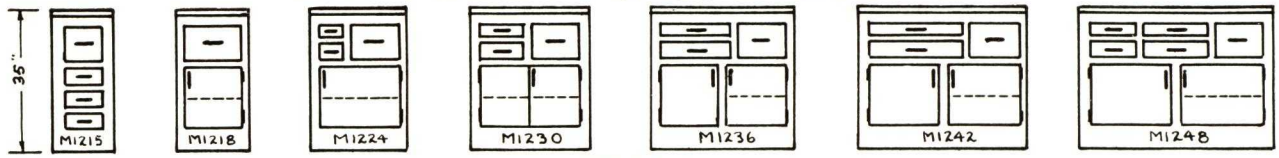
Wall Cupboards

24 in. height: in widths 18, 24, 30, 36, 42, 48 and 54 in. (over ranges, refrigerators, etc.) **28 in. height:** same. **35 in. height:** in widths 15, 18, 21, 24, 27, 30, 33, 36, 42, 48, and 54 inches. Inside measurements of shelves, $12\frac{3}{16}$ in. deep. **Corner cupboards:** M-21-C with door at 45° angle, M-24-RC open with concave front frame.



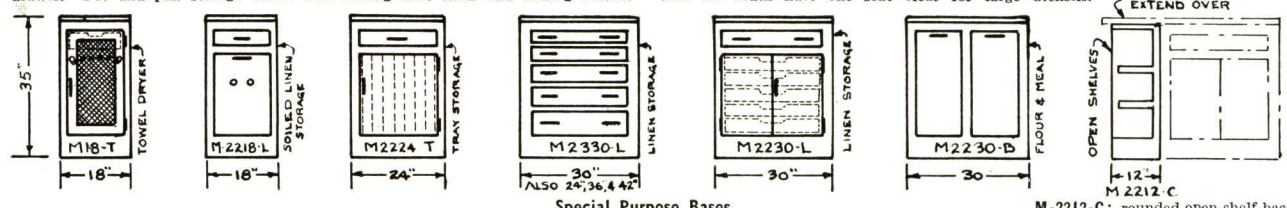
Butlery Bases

In sizes shown. 4 in. high drawer above, storage space below with one stationary shelf.



Cabinet Bases

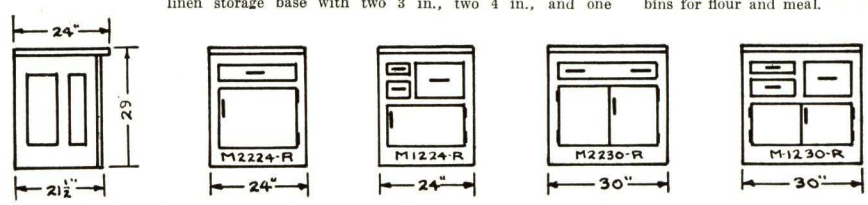
In sizes shown. All units excepting the 18 in. have bread box and cutlery tray for convenience, in all but 15 in. unit. Bases over 30 inch in width have one side clear for large utensils. drawer. Pot and pan storage below with sliding wire shelf and sliding bottom



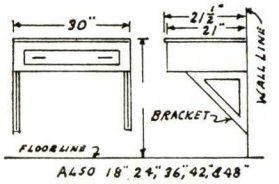
Special Purpose Bases

M-18-T: with ventilated grille door, sliding rustproof towel drying rack of 4 rods below, 5 in. high drawer above. **M-2218-L:** 4 in. drawer above, ventilated, tilting bin below for wet towels. **M-2224-T:** 4 in. drawer and storage space with removable tray rack. **M-2330-L:** linen storage base with two 3 in., two 4 in., and one 6 in. drawers. Widths, 24, 30, 36, and 42 in. **M2230-L:** linen storage base with one top drawer, and 5 drawers behind door. **M-2230-B:** two large tilting wooden bins for flour and meal.

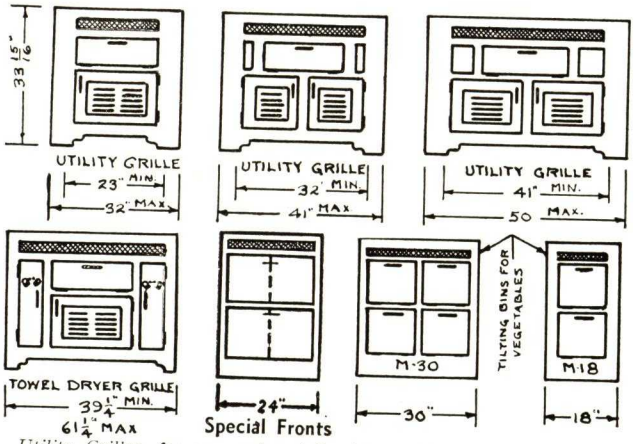
M-2212-C: rounded open shelf base for use near door. A modern unit.



Range Bases — Used principally in kitchenettes. 29 in. high to line up stove with other base tops.

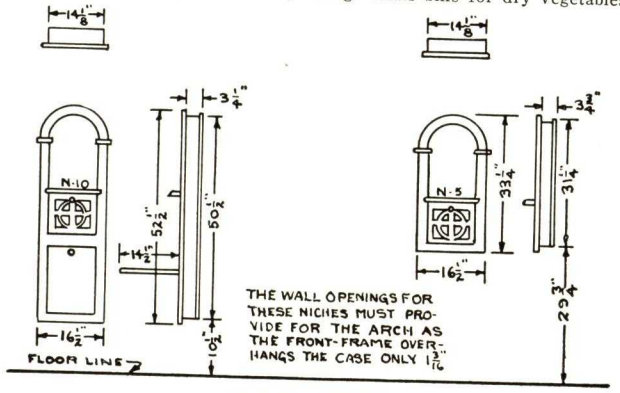


Desk — For planning menus, ordering supplies, etc. New bracket design available.



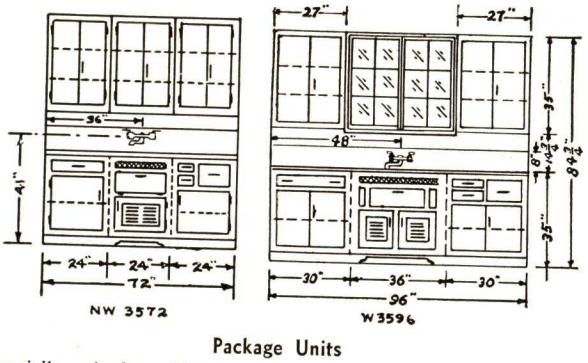
Special Fronts

Utility Grilles, for use under sinks, have grilles or slotted panels, access doors and removable, metal tilting bins for soap, etc. *Towel Dryer Grille* includes also sliding, rustproof wire rack for towels. M-30 and M-18 have removable, tilting metals bins for dry vegetables.



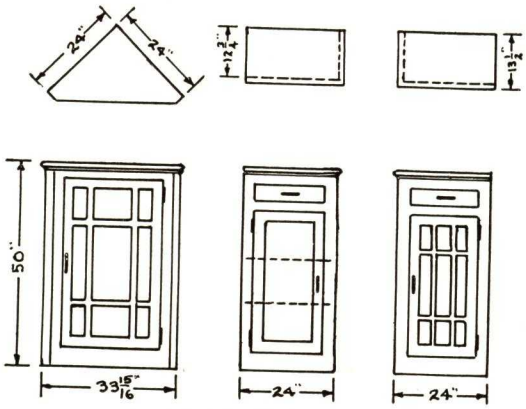
Telephone Niches

N-10 houses bell box and includes folding seat. *N-5,* without seat. Ready to install between standard studding. Finished or unfinished.



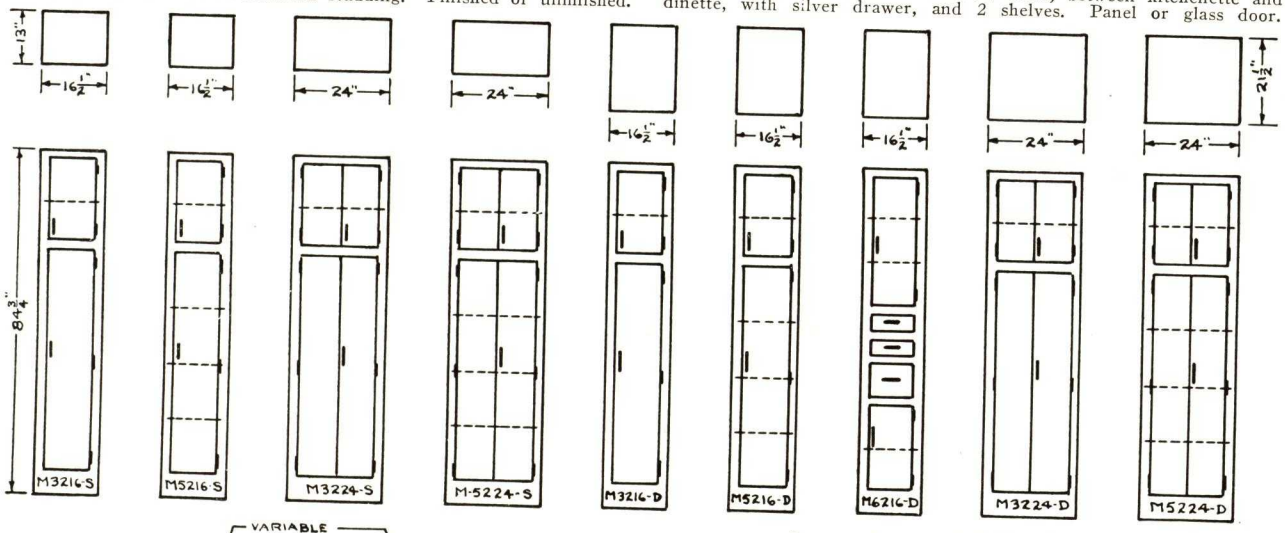
Package Units

Specially priced combinations of butlery base, sink front, cabinet base, and sink top in widths 60, 72, 84, and 96 in., assembled at factory. Available as bases only. Shown with wall cupboards above.



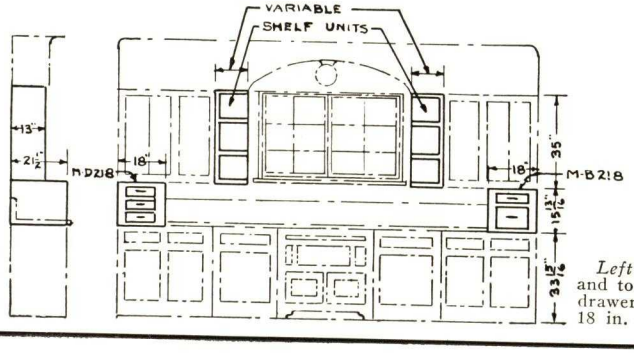
Divider Cupboards

Wide unit has 3 shelves. *Narrow units,* between kitchenette and dinette, with silver drawer, and 2 shelves. Panel or glass door.



Broom Closets and Utility Cupboards

These side units are available in two widths and two depths, with no shelves in bottom part for broom storage, or with three shelves for dishes, linen, pans, etc. M-6216-D has two 4-in cutlery drawers and one bread box.



Left: Typical use of rounded open shelf units, for modern touch and to admit more light. Available in any size. Also counter height drawer units, with three drawers or drawer and bread box. Size 18 in. wide, 15⅛ in. high, 21½ in. deep.

KITCHEN MAID
STANDARD UNIT CABINETRY

For further information call the Kitchen Maid dealer, or write THE KITCHEN MAID CORPORATION, Andrews, Indiana.

MURPHY DOOR BED COMPANY

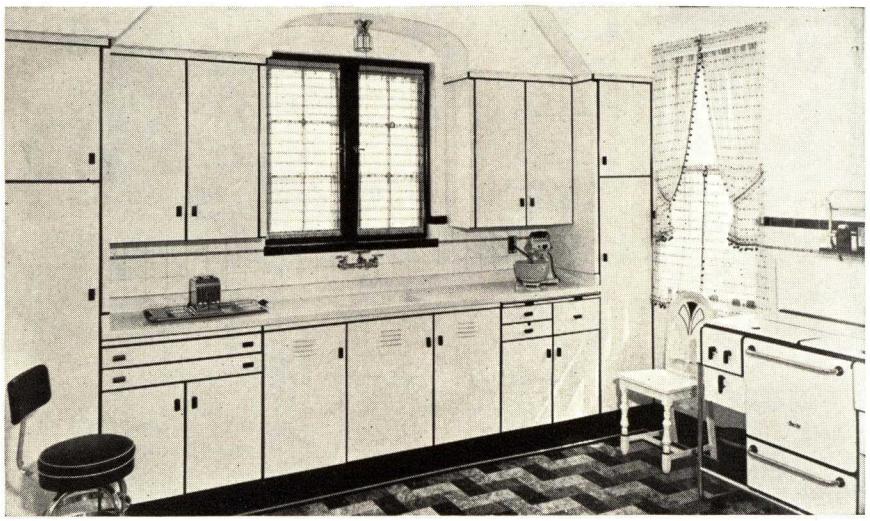
19 West 44th Street NEW YORK, N. Y.
173 West Madison Street CHICAGO, ILL.
315 No. 10th Street ST. LOUIS, MO.
2459 Grand River Avenue DETROIT, MICH.
OFFICES AND SALES ROOMS IN PRINCIPAL CITIES

For Murphy Disappearing Beds, see File Index

MURPHY CABRANETTE KITCHENS—PORCELAIN ON STEEL

The exclusive feature which gives crowning beauty to Murphy Cabranette Kitchens is porcelain. It is this porcelain, on a body of steel, which gives permanent economy. It is genuine porcelain like that on a bathtub or kitchen range, inorganic materials fused into the pores of steel at kiln temperature of 1550°. All exposed surfaces are porcelain and never require refinishing. Grease and dirt of every sort wash off without leaving a trace.

Base cabinets of various styles are available in widths from 12 to 42 in. Wall cases, in three heights, range from 12 to 66-in. widths. Accessories include every known kitchen convenience.

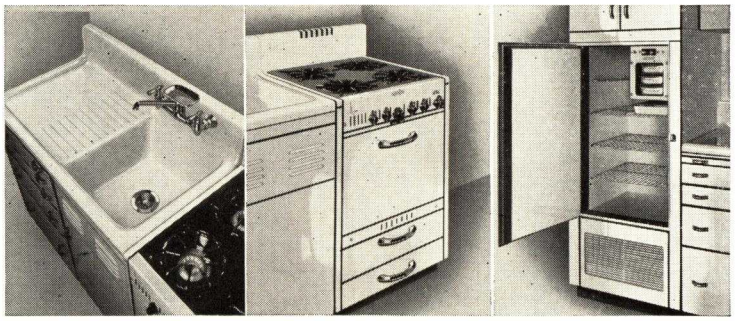


For Apartments

Standard assemblies, including range, refrigerator and sink, are made from 39-in. compacts to any desired width and arrangement. Ample air supply is furnished both refrigerator and range from the front. Cabinets placed on either side will not impair efficiency. Toe space provided under complete assembly.

For Residences

Money cannot buy greater kitchen beauty or greater economy based on years of unblemished service. Assemblies arranged to meet individual requirements. Standard ranges and refrigerators may be used. Sinks and work table tops of porcelain, stainless steel, monel, linoleum or maple.



Exclusive Murphy Sinks

Porcelain on cast iron, made from our own patterns. Note generous depth and size of bowl. Note large drain outlet made to hold basket type strainer and valve so that water may be held in sink.

Exclusive Murphy Ranges

Gas or electric. Though only 21 in. wide, this apartment range has cooking capacity comparable with any domestic range. Oven 17 x 18 x 12 in.; broiler compartment 4 in. high. Burners light automatically. Oven control and hinged top available.

Exclusive Murphy Refrigerators

Gas or electric. Adequately insulated; full porcelain interior and front. Automatic temperature control, illuminated interior. May be installed tightly between cabinets or against building wall. High and low types. Shipped assembled.

MURPHY WOOD KITCHENS

A complete line to meet the requirements of every kitchen. Only selected materials are used in painstaking construction. Doors are five-ply construction, banded on all four sides to reduce possibilities of warping to a minimum.

With modern paint department facilities, we apply a finish which we claim is not duplicated in the kitchen field. Every cabinet receives three coats, thoroughly sanded.

Write for literature.

RECEIVADOR DIVISION
METAL OFFICE FURNITURE CO.

GRAND RAPIDS, MICH.

THE RECEIVADOR

The Receivador is an automatic self-locking delivery receptacle for wall or door installation in apartment buildings or private residences. It obviates the necessity of delivery men entering the home by providing an outside depository for packages, parcels, etc.

RECEIVADOR
"The Automatic Servant"
TRADE-MARK

The entire Receivador cabinet is made of high grade, heavy gauge furniture steel. All joints are electrically welded. No screws or rivets are used. Each unit is equipped with two doors—one opening from the outside, the other from the inside. Ample storage space between the two doors.

Doors are of double steel-wall construction with a substantial filler of insulating material between the two sheets of steel. Each door has a sturdy "dead bolt" lock operated by solid brass thumbpieces (no keys). All hardware exposed to wear is solid brass.

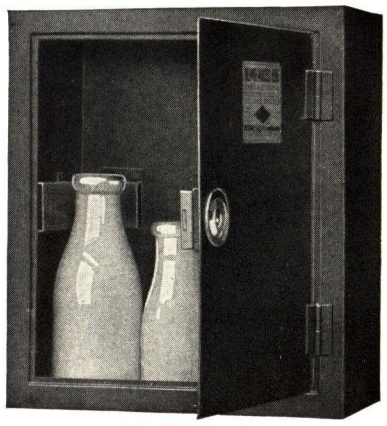
Methods of Locking

The Receivador interlock is a special device that prevents both doors being opened at the same time. It insures complete and secure closure at all times between the outside and the inside of the home.

The interlock consists of a solid steel bar which slides back and forth between the doors alternately engaging the locks. When the outer door is closed and the thumbpiece turned, the interlock is engaged, thereby securely locking the outside door and releasing the inner door. Conversely, by locking the inner door after removal of the contents of the cabinet, the outer door is again released for the next delivery. This renders the Receivador thiefproof, and positively guards the home against intrusion, as the inner door cannot be opened while the outer door is unlocked.

Key-locked Receivadors

For apartment buildings where tradesmen are not permitted to deliver directly to tenants, Receivadors are furnished with master-keyed locks. Service men then make deliveries "en masse" at regularly appointed times. Locks are of high grade steel and are protected against rust by cadmium plating.



The Receivador

Where Receivadors Are Installed

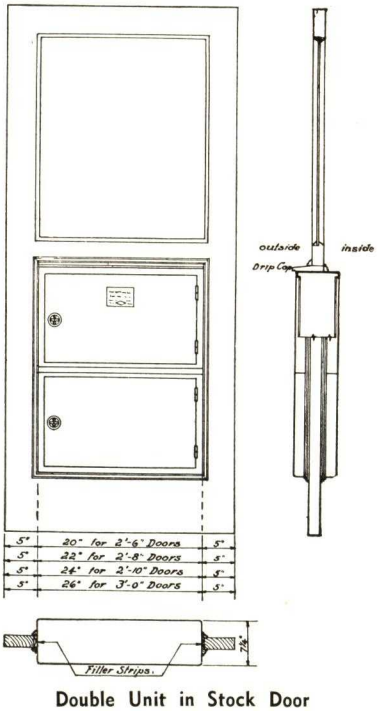
In private homes Receivadors may be installed either in the rear service door or in the adjacent wall. In apartment buildings, the Receivador is installed in the service door of the apartment or in the wall leading to the kitchen. In single entrance apartments, where other space is neither available or convenient, Receivadors are installed in the main entrance door.

How Installed

Receivadors are provided with holes for fastening with screws. Rough openings with standard frames should be left when walls are erected and Receivadors installed when carpenters install other trim. Receivadors can be used in any door. When installed in new doors, it is suggested that the mill making the doors install the Receivadors.

Various Types

Receivadors are made in one- or two-compartment sizes and are also built into multiples to meet any requirement and arrangement. The Standard Receivador consists of two compartments to accommodate two deliveries before being emptied. The "Junior" is for moderately priced homes and apartments.



Double Unit in Stock Door

DIMENSIONS

Double compartment units, in.		Single compartment units, in.		Size door, ft. in.	
Width	Height	Width	Height		
Standard Receivadors					
20	32	20	16	2	6
22	32	22	16	2	8
24	32	24	16	2	10
26	32	26	16	3	0
Junior Receivadors					
14	32	14	16	2	0

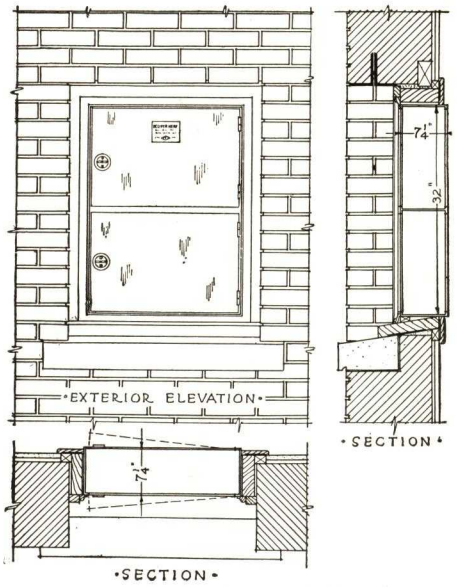
All cabinets are 6¼ in. deep inside, and 7¼ in. over all. Sizes listed are standard and carried in stock. Special sizes and compartment arrangements can be furnished for the larger operations.

Colors

Standard Receivadors are finished in olive green, non-rusting, baked enamel which will harmonize with practically any color scheme. Also supplied in any grained finish to match the natural wood at a nominal additional cost.

Guarantee

Receivadors are unconditionally guaranteed for one year from date of delivery. They are in nation-wide use and have been specified by architects and used by builders for more than twenty years.



Double Unit in Brick Wall

A portfolio, with complete information and details of types, construction and typical installations, is available on request

THE PARSONS COMPANY

15843 Second Boulevard
DETROIT, MICH.

PARSONS Pureaire KITCHEN

This exclusive and entirely practical "Pureaire" Kitchen has been on the market in actual use for eight years. It has enjoyed wide demand as equipment for apartments, hotels and in remodeling operations. We have seen nothing to compare with it in quality. It is beautiful, convenient and sanitary. It attracts better tenants because it gives the apartment the aristocratic and quality equipment found only in the finest homes and takes less space.

Advantages

(1) Saving of floor space. The "Pureaire" occupies less than 8 sq. ft. Permits 10% more apartments on any building plot.

(2) It has everything within reach, and is easy to keep clean.

(3) Cooking behind closed doors keeps apartment clean, cool and sanitary.

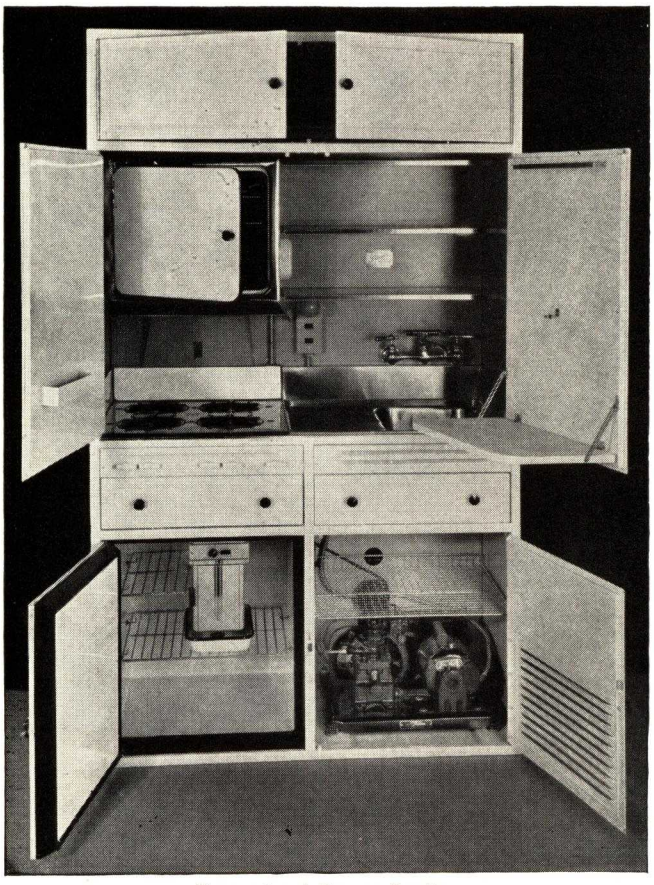
(4) Saves re-decorating expense, as fumes are carried off through the flue.

(5) It eliminates the fire hazard of the open stove.

(6) Low initial cost, because of being produced in dies by an efficient manufacturing organization. All parts interchangeable.

(7) Installs in one piece, direct from crate. No additional doors needed. No delays waiting for this or that unit.

(8) Attracts and holds tenants, as proved by apartment and hotel installations from coast to coast.



Patented and Patents Pending

Description

The Parsons Pureaire Kitchen includes:

Range — A full-size modern 4-burner gas range and oven with automatic lighters. Concealed manifold. Porcelain grates. A. G. A. approved. Electric range optional.

Oven—16-in., heavily insulated. Porcelain lined. Broiler and baking compartments.

Refrigerator—A 4¼-cu. ft. electric refrigerator. All-steel cabinet. Maple door frame. "Dry zero" insulation —the kind rated 100% by the United States Government. Or furnished to take Electrolux H-410 gas refrigerator.

Sink—One-piece sink and ribbed drainboard. Monel metal standard.

Cupboard—20 sq. ft. of cupboard and shelf space for dishes and cooking utensils.

Utility Drawers—Two—20x20x4½ ins. with padded compartment for silverware.

Light—Electric light and a handy electric outlet built in above the sink.

Ventilation — Patented Parsons Pureaire vents placed directly above oven and overhead shelves. Air is taken in from bottom of the cabinet. There is an air space behind the splash-boards and shelves, permitting circulation of air through the entire cabinet.

Weight—510 lbs.; crated, 585 lbs.

Size—80 ins. high, 45¾ ins. wide, 22¼ ins. deep.

Color—Ivory exterior; Chinese red or Jonquil green interior.

Cabinet—Sheet steel welded to a steel frame with flush joints. Doors on chromium-plated continuous piano hinges.

TODAY'S KITCHEN AND TOMORROW'S — VENTILATED AND FLUSH WITH WALL

Biggest room in the whole house was once the kitchen. But how its size has shrunk in modern building plans. In today's model home, the kitchen has become actually the *smallest* room. In tomorrow's, one may see *no kitchen at all.* Yet it will be there, in complete detail.

Open the doors of that lacquered steel cabinet that blends so unobtrusively into the wall, and what do you see? A whole Parsons Pureaire Kitchen, all of steel, complete to the last essential detail and brilliant with permanent, never-rusting monel trim.

Complete—Odorless

Full-size gas or electric stove, oven, monel sink and drainboard, generously sized electric refrigerator and unit, table-shelf, drawers for silver and cutlery, abundant shelf room for packaged foods. Everything full size and ready to cook a fine dinner for the whole family.

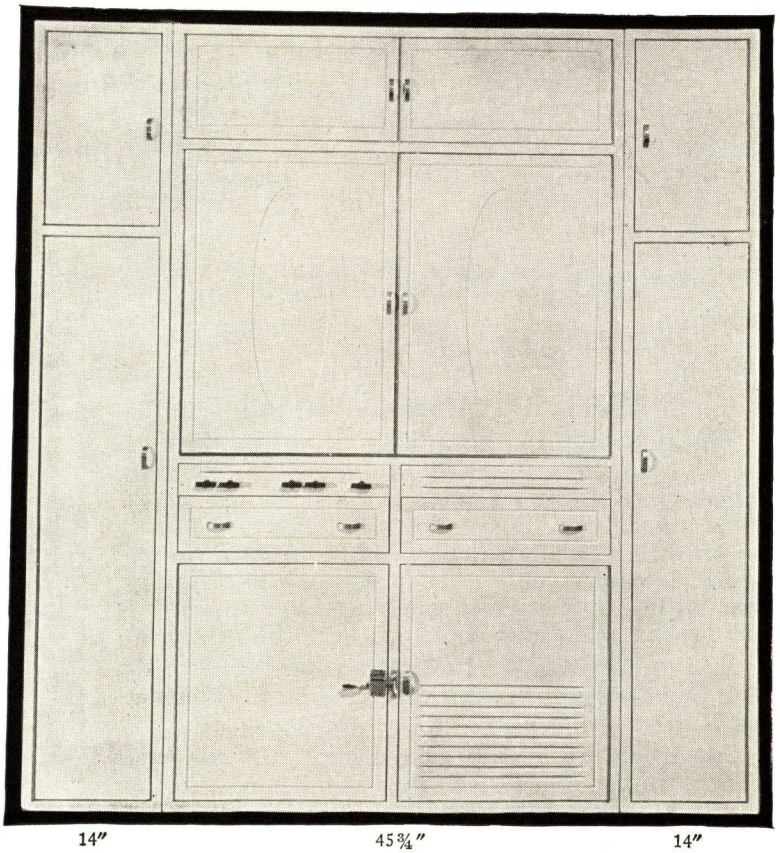
Best of all, this Parsons Pureaire Kitchen is *absolutely odorless.* It connects not only with gas, water and electricity, but also with a ventilating shaft. With the steel doors closed, there is always an air current flowing through the whole kitchen. *Gas or cooking odors simply cannot come out into the room.*

For Remodeling

Pureaire Kitchens have enabled owners of obsolete apartment buildings to remodel into smaller suites and restore rentals to a profit basis. Hotels have increased income by similarly remodeling entire floors for resident guests.

For New Apartments

Most new multi-residence buildings are today made up of small apartments. In such buildings, separate kitchens are a flagrant waste of valuable space. So Pureaire Kitchens are going in everywhere as standard equipment.



14″ 45¾″ 14″

For Private Homes

In their plans for large new homes, architects often incorporate Parsons Pureaire Kitchens as auxiliary equipment. A Pureaire in the nursery cooks the children's food. Another in the recreation room similarly saves steps and avoids confusion. In the White House wing devoted to the offices of the President of the United States, luncheon prepared in a convenient Parsons Pureaire Kitchen is often served.

Small modern homes profit enormously by the Pureaire's economy of space and money. *Already the kitchen of yesterday is becoming the sun room or the living room of tomorrow.*

Modern housewives fall in love with the Pureaire at first sight. They enjoy its freedom from odors, its compactness, the ease with which it is kept clean, the time and steps it saves in their work. Women accustomed to large, old-fashioned kitchens, are always surprised and delighted at their ability to handle *all culinary tasks easier and better* with Pureaire.

Pureaire-equipped apartments rent more readily *and for more money.* Their tenant turnover is always low.

Price, Less Than Its Units

All equipment built into the Parsons Pureaire Kitchen is of the highest quality. The whole Pureaire is a unit, built like a battleship. Yet, complete and in service, it actually costs less than its components, bought and installed separately. Deliver the Pureaire in the morning; start collecting rent in the afternoon.

Models

"Pureaire" *Standard* Model has gas range and electric refrigerator.

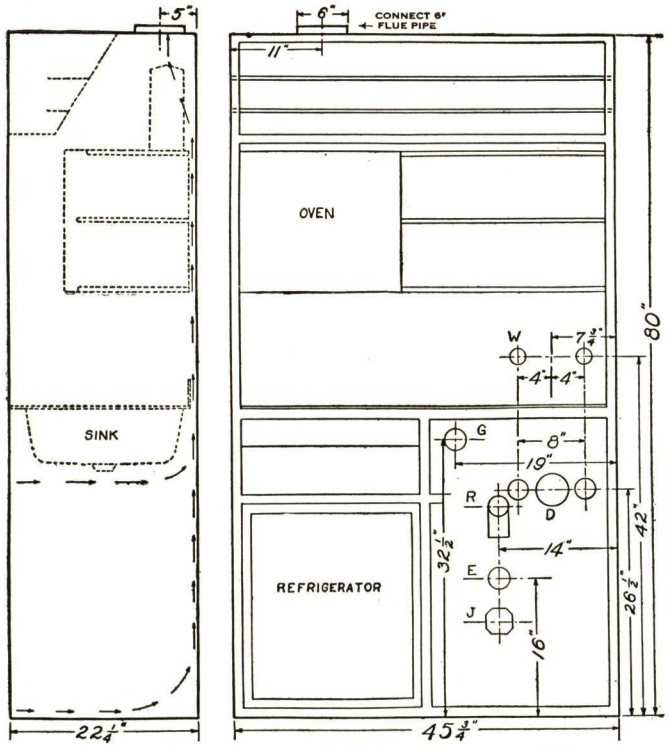
"Pureaire" *Electric* Model has highest quality type electric range.

"Pureaire" *All-Gas* Model has gas range with side unit to fit over Electrolux H410 gas refrigerator.

"Pureaire" all-steel side cabinets, for additional storage, supplied for installation on either or both sides of all Pureaire models.

PARSONS Pureaire KITCHEN

PLUMBING DIAGRAM No. 5



PARSONS "PUREAIRE" KITCHEN
45¾″ Wide x 80 High x 22¼″ Deep

W—Water
D—Drain
E—Elec. Wires
G—Gas
J—Junction box
R—Receptacle

We furnish all electrical equipment inside the cabinet.

"Pureaire" Electric Kitchen takes 110-220 volt, three wire circuit. Connected load 7200 watt.

ST. CHARLES MANUFACTURING COMPANY

Designers and Fabricators of Steel Kitchen Cabinets
and Sheet Metal Products

ST, CHARLES, ILL.

REPRESENTATIVES IN PRINCIPAL CITIES

TWO COMPLETE LINES OF

St. Charles

STEEL KITCHEN CABINETS

Making possible the use of steel cabinets in the small home or apartment, as well as in much larger establishments, the Master Line includes all the fine advantages and high quality specifications found in the better grades of steel kitchen cabinets. The Econo Line was designed to meet the demand for a complete line of steel kitchen cabinets, moderately priced, with many of the fine features found only in higher priced cabinets.

Modern Styling—In keeping with the trend of the day, emphasizing unbroken, vertical lines, and eliminating horizontal or cross lines wherever possible.

Construction—Special high quality furniture steel made according to our own specifications, ample gauges, properly fabricated to give rigidity and strength, assuring long and satisfactory service.

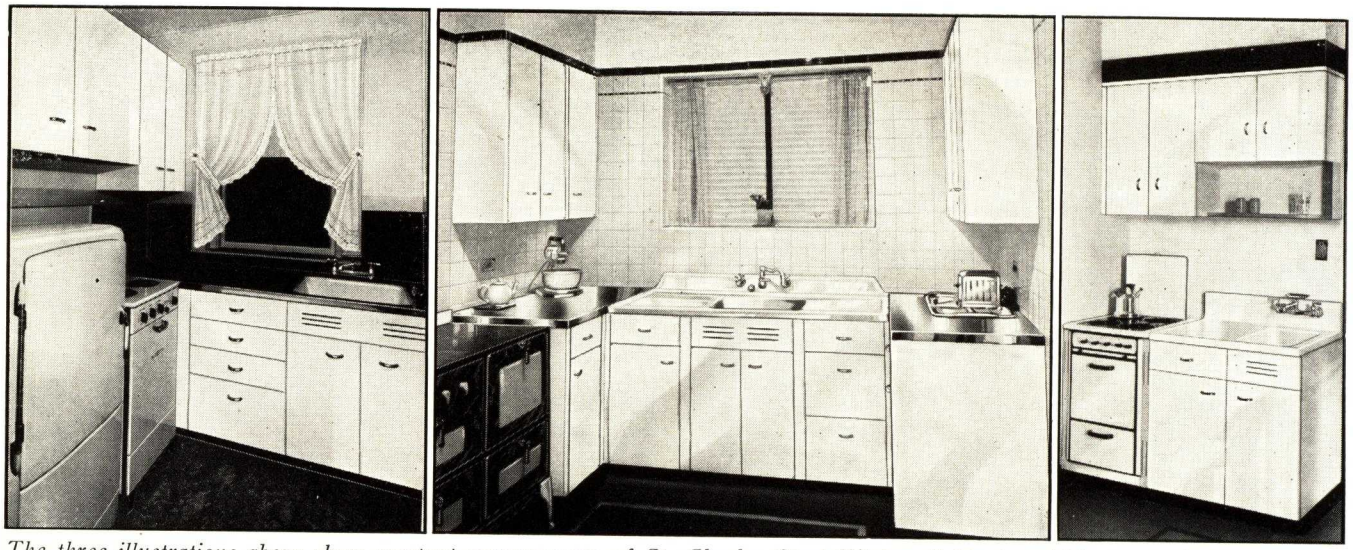
Standardization—Full range of standard sizes including wall, base and sink base cabinets, implement and utility cabinets, makes easy the selection of cabinets to fit special requirements.

Sinks and Work Tops— Stainless steel, Monel, linoleum, porcelain, rubber, or maple available in standard sizes, or special lengths to fit individual requirements.

Features—Sound deadened, double panel doors and drawer fronts. Hinges practically invisible, yet with strength beyond that which will be required. Drawers operate easily and quietly on steel and terne-plate slides, capable of carrying unusually heavy loads. Toe space, eliminating scuffing and allowing user to stand close to cabinet.

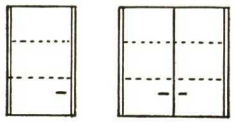
A compact and efficient layout of range, sink and refrigerator combined in a pleasing arrangement with St. Charles Steel Kitchen Cabinets

Accessories—Cutlery tray, bread and cake box, sliding flour and sugar bins, tray storage cabinet, sliding towel rack, towel rod, garbage receptacle, step shelf, vegetable drawer, auxiliary storage rack, pastry board, lumiline lights. Added refinements available in Master Line only: vegetable storage cabinet, silver storage cabinet, linen base cabinet, plate warmer and towel drier cabinets, planning desk or planning table.



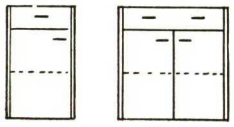
The three illustrations above show compact arrangements of St. Charles Steel Kitchen Cabinets, which are typical layouts for apartments and small residence installations

St. Charles MASTER LINE



Wall Cabinets

18″, 30″, and 36″ high—12″ deep.
Single door—15″, 18″ wide (either right or left-hand door swing).
Double door—21″, 24″, 27″, 30″, 33″, 36″ wide.
18″ high cabinets—1 welded shelf.
30″ high cabinets—2 adjustable shelves.
Glass doors also available.

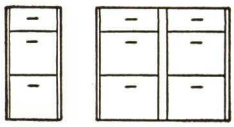


Cupboard Base Cabinets

30½″ high—sub-base and work top not included.
Standard depth 24¾″. Also available in any depth less than standard at slight additional cost.
1 drawer, 1 door, 1 adjustable shelf—15″ and 18″ wide.
1 drawer, 2 doors, 1 adjustable shelf—21″, 24″, 27″, 30″, 33″ wide.
2 drawers, 2 doors, 1 adjustable shelf—36″ wide.

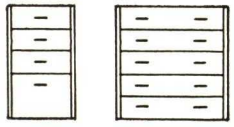
Drawer Base Cabinet

30½″ high—sub-base and work top not included.
Standard depth 24¾″. Also available in any depth less than standard at slight additional cost.
1 shallow drawer, 2 deep drawers—15″, 18″, 21″, 24″, 27″, 30″, 33″ wide.
2 shallow drawers, 4 deep drawers—36″ wide.



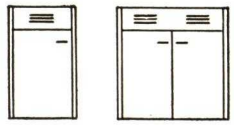
Cupboard and Drawer Cabinet

30½″ high—sub-base and work top not included.
Standard depth 24¾″. Also available in any depth less than standard at slight additional cost.
2 shallow drawers, 2 deep drawers, 1 door, 1 adjustable shelf—36″ wide.



Four and Five-Drawer Cabinets

Any deep drawer may be substituted with two shallow drawers.
In this way various drawer arrangements are available.

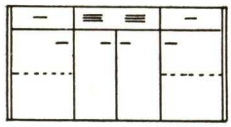


Sink Fronts

30½″ high—sub-base not included.
Louvered panel at top—doors below.
Single door, standard widths—15″, 18″.
Double door, standard widths—21″, 24″, 27″, 30″, 33″, 36″.
Available in fractional widths other than standard.
Grilled doors also available.

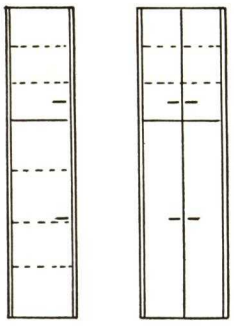
Sink Bottom Plates

Made in standard sizes or fractional widths to fit sink front.



60″ Sink Base Cabinet

60″ wide—24¾″ deep.
30½″ high not including sub-base or sink top.
Two shallow drawers (right-hand drawer furnished with dividers for cutlery storage), 2 doors, 2 shelves welded in place.
Louvered panel and storage space in center.



Implement Cabinet

80″ or 86″ high—sub-base not included—12″ or 24¾″ deep.
2 doors, 2 shelves, 2 broom clips, 2 coat hooks—18″ wide.
4 doors, 2 shelves, 2 broom clips, 2 coat hooks—24″ wide.

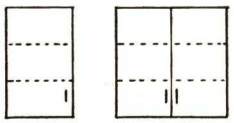
Utility Cabinets

80″ or 86″ high—sub-base not included—12″ or 24¾″ deep.
2 doors, 6 shelves—18″ wide.
4 doors, 6 shelves—24″ wide.

St. Charles Econo-Line

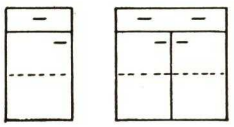
Wall Cabinets

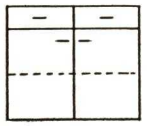
18″ and 30″ high—12″ deep.
Single door—15″, 18″ wide (either right or left-hand door swing).
Double door—21″, 24″, 27″, 30″, 33″, 36″ wide.
18″ high cabinets—1 welded shelf.
30″ high cabinets—2 welded shelves.
Glass doors also available.



Cupboard Base Cabinets

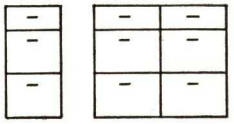
30½″ high—sub-base and work top not included.
Standard depth, 24¾″. Also available in any depth less than standard at slight additional cost.
1 drawer, 1 door, 1 welded shelf—15″ and 18″ wide.
1 drawer, 2 doors, 1 welded shelf—21″, 24″, 27″, 30″, 33″ wide.
2 drawers, 2 doors, 1 welded shelf—36″ wide.





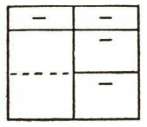
Drawer Base Cabinet

30½″ high—sub-base and work top not included.
Standard depth 24¾″. Also available in any depth less than standard at slight additional cost.
1 shallow drawer, 2 deep drawers—15″, 18″, 21″, 24″, 27″, 30″, 33″ wide.
2 shallow drawers, 4 deep drawers—36″ wide.



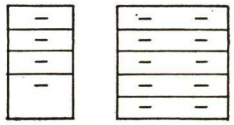
Cupboard and Drawer Cabinet

30½″ high—sub-base and work top not included.
Standard depth 24¾″. Also available in any depth less than standard at slight additional cost.
2 shallow drawers, 2 deep drawers, 1 door, 1 welded shelf—36″ wide.



Four and Five-Drawer Cabinets

Any deep drawer may be substituted with two shallow drawers.
In this way various drawer arrangements are available.

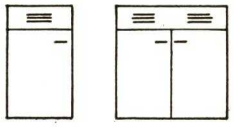


Sink Fronts

30½″ high—sub-base not included.
Louvered panel at top—doors below.
Single door, standard widths—15″, 18″.
Double door, standard widths—21″, 24″, 27″, 30″, 33″, 36″.
Available in fractional widths other than standard.
Grilled doors also available.

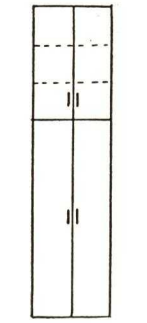
Sink Bottom Plates

Made in standard sizes or fractional widths to fit sink front.



60″ Sink Base Cabinet

60″ wide—24¾″ deep.
30½″ high not including sub-base or sink top.
Two shallow drawers (right-hand drawer furnished with dividers for cutlery storage), 2 doors, 2 shelves, welded in place.
Louvered panel and storage space in center.



Implement Cabinet

80″ high—sub-base not included—12 or 24¾″ deep.
4 doors, 2 shelves, 2 broom clips, 2 coat hooks—21″ wide.

Utility Cabinet

80″ high—Sub-base not included—12″ or 24¾″ deep.
4 doors, 6 shelves—21″ wide.

Consult our Kitchen Planning Division for expert advice on the efficient arrangement of all equipment and proper layout of cabinets to be incorporated in the kitchen—the room in the home that serves the family most.

MEMORANDA

UNITED METAL BOX CO., INC.

168-186 Seventh Street, BROOKLYN, N. Y.

For United Cabinets, Venetian Blinds, Waste Receptacles and Mail Boxes, see File Index

MODERN STEEL SINK AND KITCHEN CABINETS

The new United Steel Cabinets sound the true keynote of a scientifically designed kitchen, and its utility is enhanced by the natural grouping of overhead wall cabinets and adjacent work cabinets.

These cabinets are manufactured in various standard sizes which lend themselves readily to flexible setups adaptable to every size kitchen. Constructed of the finest material, fabricated in a most durable manner and finished with a glistening white Dulux enamel sprayed on and baked at a high temperature, these cabinets combine the elements of truly fine kitchen equipment.

Adjustable Legs
Easy Installation
Concealed Hinges
Ample Toe Room
Cutlery Drawers
Ample Storage Space

Dulux Enamel
Easily Cleaned
Modern Hardware
Adjustable Shelves
Cushioning Bumpers
Positive Catches

SINK CABINETS

Cat. No.		Type of Sink	Description
Bevelled Corner	Round Corner		
500	600	42x20-in. RH drainboard	2 drawer—2 compartment
501	601	42x20-in. LH drainboard	2 drawer—2 compartment
504	604	52x20-in. RH drainboard	2 drawer—2 compartment
505	605	52x20-in. LH drainboard	2 drawer—2 compartment
506	606	60x22-in. double drainboard	4 drawer—3 compartment
510	610	42x22-in. sink and tray	2 door—reversible
511	611	50x22-in. sink and tray	3 door—reversible
520	620	42x20-in. drainboard	2 door—reversible

WALL CABINETS—12 IN. DEEP

Cat. No.	Width	Height	Number of shelves
1821	21 in.	18 in.	1
1827	27 in.	18 in.	1
1830	30 in.	18 in.	1
2821	21 in.	28 in.	2
2830	30 in.	28 in.	2

BASE CABINETS—35 IN. HIGH

Cat. No.	Width	Depth
2221	21 in.	22 in.
2230	30 in.	22 in.

Write for Complete Catalog of United Products

TRACY MANUFACTURING COMPANY

Manufacturers of the Complete Line of Cabinet Sinks and Tops for Built-in Kitchen Cabinet Units

3125 Preble Avenue N. S., PITTSBURGH, PA.

ENDURO STAINLESS STEEL Silvi Sheen **CABINET SINKS AND TOPS**

(Alternative material, Monel Metal when required)

Sink Showing One Special Extra Deep Bowl

ARCHITECTURAL SPECIFICATIONS

Material

Drainboards, Back Splashers, End Splashers—Stainless steel, (18% chromium, 8% nickel, level stretched) 20-gauge (U. S. Standard) polished one side to Tampico Satin Finish.

Sink Bowl—To be stainless steel (18% chromium, 8% nickel) 18-gauge (U. S. Standard) polished inside to Tampico Satin Finish. Bowl size to be 16x23½x7½ in. (alternate 15x17½x7¼ in.) (alternate 16 and 29½x7½ in.).

Construction

(A) Drainboards and back splasher to be machine die fabricated from one continuous sheet of metal without seams or joints.

(B) Drainboards and back splasher to be machine die fabricated from one continuous sheet of mill polished metal without marring or scratching polished surface.

(C) End splasher or splashers to be integral with drainboard.

(D) Drainboards to have raised edges ⅜ in., with square outer edge, or with round outer edge.

(E) Corners of edges are to be welded, ground and polished to Tampico Satin Finish.

(F and G) Drainboards, back splashers and end splashers to be supported by 14-gauge (.078 in.) steel plates, and with skeleton wood underframe. Steel plates to be securely bonded to stainless steel.

(H) Sound deadening material to be used between metal and all wood underframes.

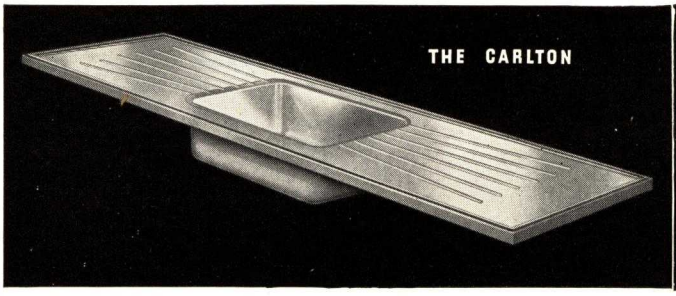
(I) Sink bowl 16x23½x7½ in. (alternate 15x17½x7¼ in.) to be die drawn from one piece of metal, all edges and corners to have a radius of not less than 1¼ in. Sink bowl 16x29½x7½ in. to be welded, edges and corners to have radius not less than 1¼ in. Bowl to be sweated to drainboard (or alternate—bowl to be electrically welded to drainboard).

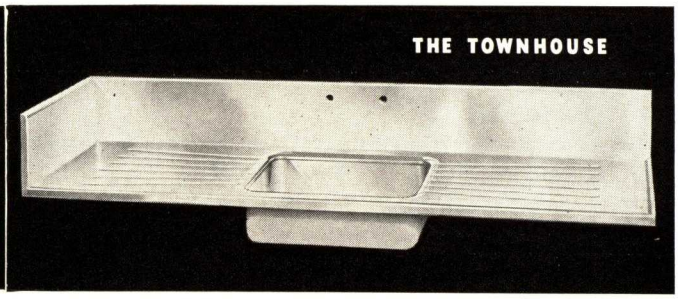
(J) The bowl is to be sprayed on underside with sound deadening material.

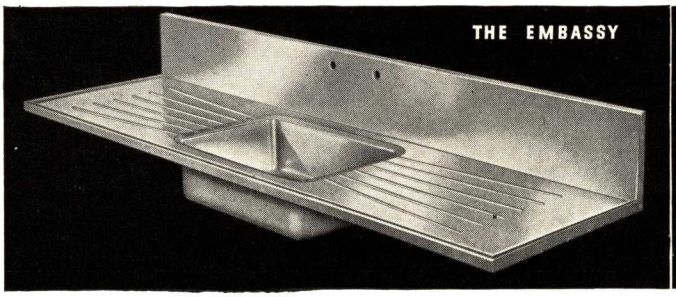
(K) The drainboards to have six drain grooves depressed below the plane of the top.

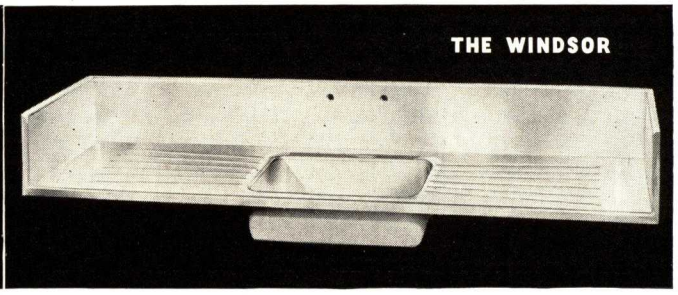
(L) Depth of drain grooves to increase in approaching bowl.

(M) The drainboards are to be flanged downward around the edge of the bowl at an angle of 15° and for a distance of 1¼ in. from edge of bowl. Drainboards are to have approximately ¼ in. drain in 24 ins.









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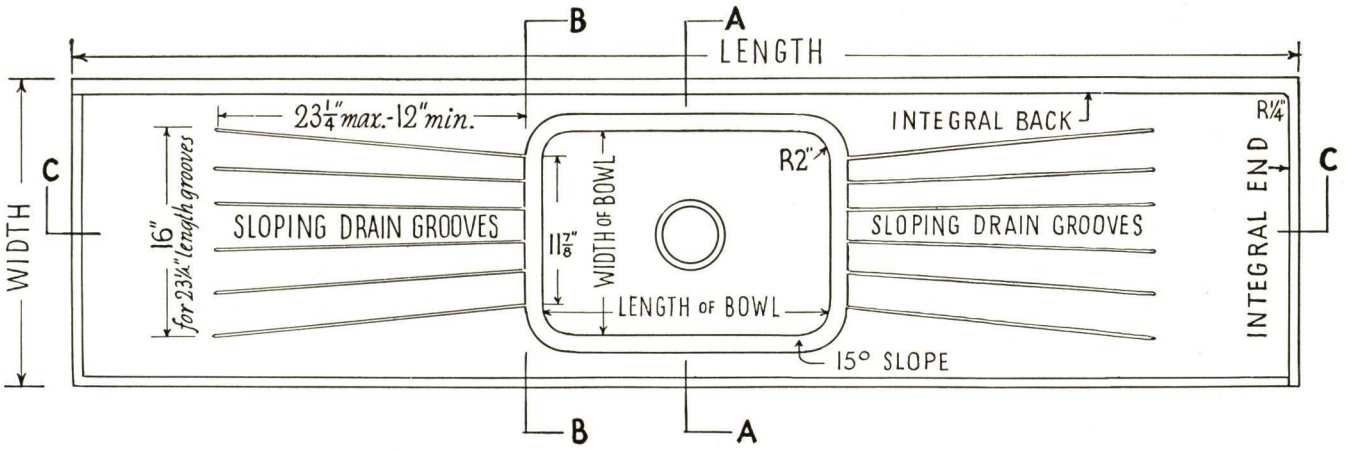
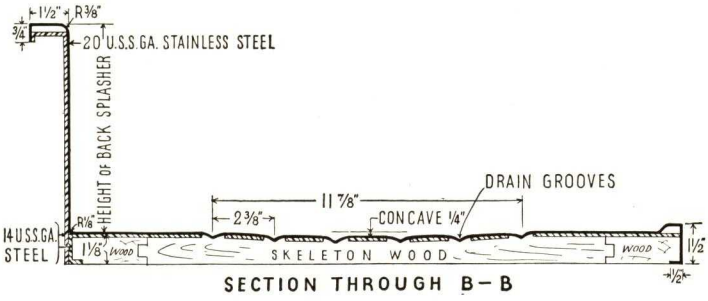
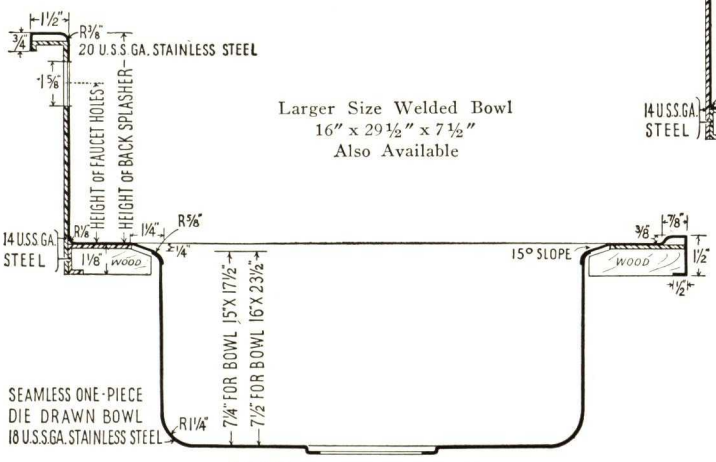
CONSTRUCTION DETAILS FOR SILVISHEEN CABINET SINKS



Construction details shown in diagrams illustrate some of the features of the Silvi Sheen Cabinet Sinks



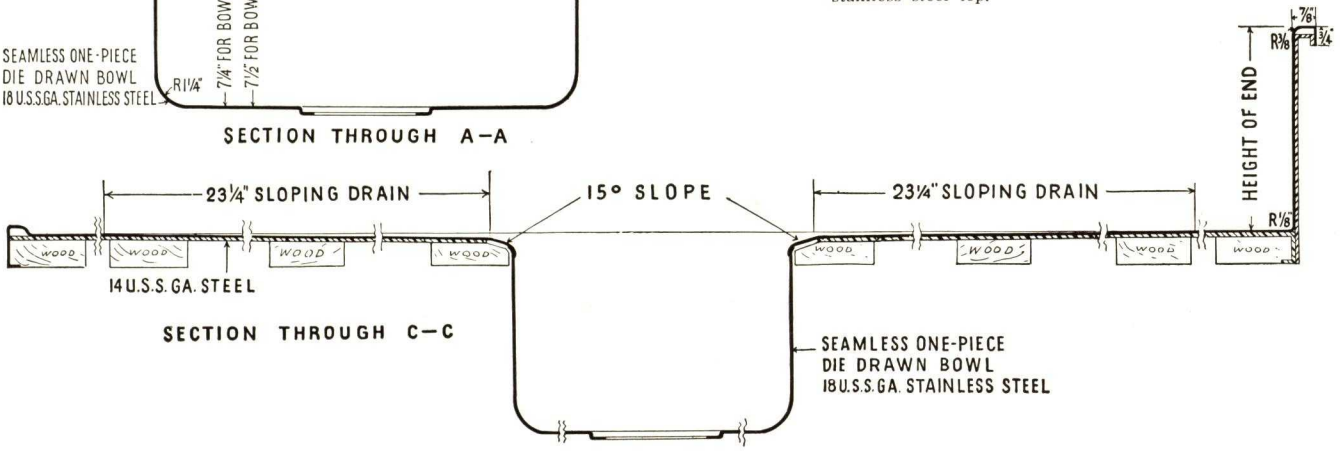
SECTION THROUGH B–B



Larger Size Welded Bowl
16" x 29½" x 7½"
Also Available

SECTION THROUGH A–A

Steel underplates are securely bonded to stainless steel top.



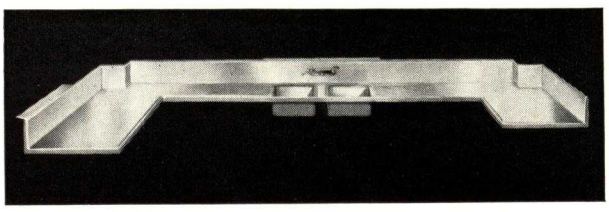
SECTION THROUGH C–C

SPECIAL CONSTRUCTIONS FOR UNUSUAL CONDITIONS

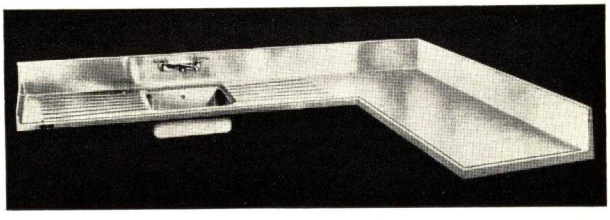
Silvi Sheen

The illustration below shows a very special U-shaped sink with two bowls, special backs, and pipe chase construction to take care of unusual room conditions.

The illustration below shows a one-piece L-shaped sink with back splasher. This type of construction can be almost any reasonable dimension or arrangement.



All Types
All Sizes
to Fit
Any Space

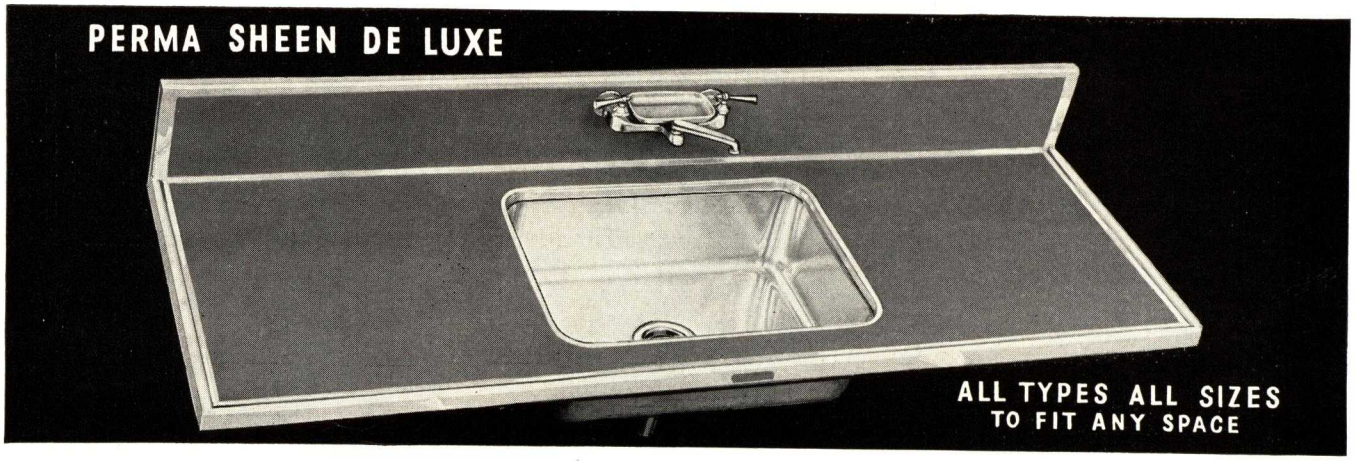


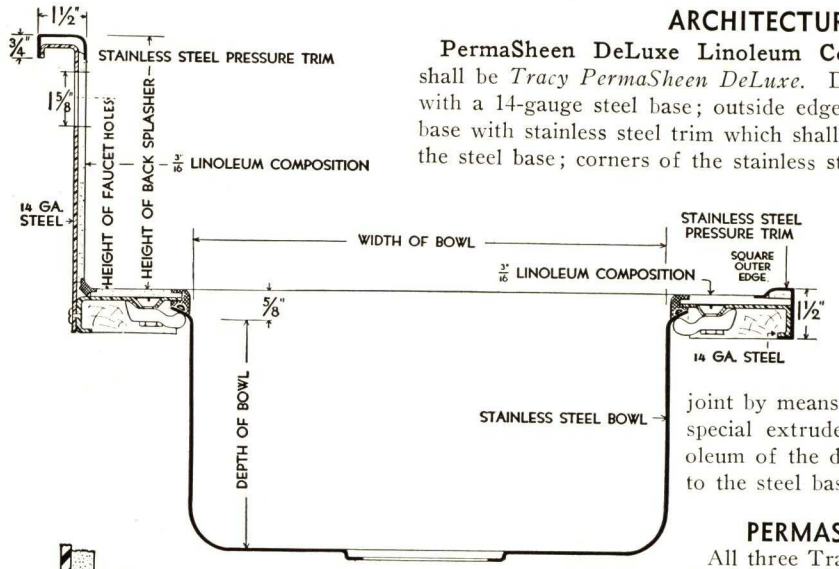
TRACY MANUFACTURING COMPANY

A Complete Line of Cabinet Sinks and Tops for Built-in Kitchen Cabinet Units in All Types All Sizes, to Fit any Space

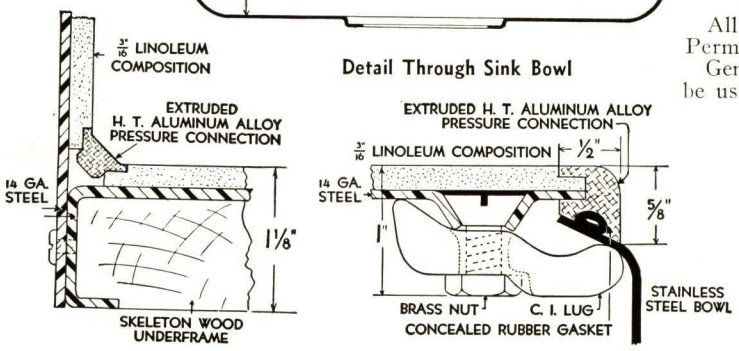
LINOLEUM COMPOSITION PermaSheen CABINET SINKS AND TOPS

U. S. Patent Nos. 2038637, 2038638, 2038668





Detail Through Sink Bowl



ARCHITECTURAL SPECIFICATIONS

PermaSheen DeLuxe Linoleum Composition Cabinet Sinks and Tops—Sinks shall be *Tracy PermaSheen DeLuxe.* Drainboards shall be 3/16-in. linoleum composition with a 14-gauge steel base; outside edges of linoleum shall be held securely to the steel base with stainless steel trim which shall form a pressure joint between the linoleum and the steel base; corners of the stainless steel trim shall be welded and seamless; stainless steel trim shall have a raised bead to prevent overflow of water from the drainboards and shall be rabbeted into the linoleum to form a flush joint. Bowl (s) shall be [15x17½x7¼ in.] [16x23½x7½ in.] one-piece die drawn of 18-gauge stainless steel [monel metal] with large radii at the corners; bowl (s) shall be fastened to the drainboards with a watertight joint by means of a rubber gasket compressed into a recess of special extruded shape which shall be rabbeted into the linoleum of the drainboards, and shall hold the linoleum securely to the steel base around the edge of the bowl.

PERMASHEEN DELUXE WITH DISHWASHER

All three Tracy sinks—SilviSheen, PermaSheen DeLuxe, and PermaSheen Imperial—can be adapted for dishwashers.

General Electric, Westinghouse or Hobart dishwashers may be used.

ADVANTAGES

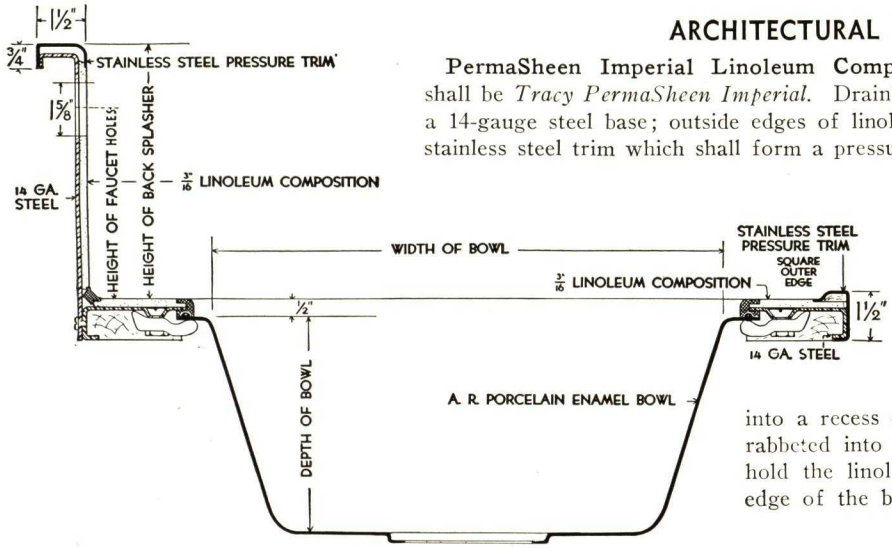
PermaSheen DeLuxe Cabinet Sinks and Tops offer the advantages of stainless steel die drawn bowls and quiet, resilient, and colorful work surfaces. These sinks are obtainable in the following colors: Black, Gray, Brown, Terra Cotta, Evergreen, Chocolate, Marbleized Black, Taupe Jaspe, Driftwood Gray Jaspe, Steel Gray Jaspe, Malay Brown Jaspe, Autumn Brown Jaspe and Hunter Green Jaspe. They are particularly desirable for use in butlers' pantries where the handling of fine china and glassware requires a resilient material for work surfaces. They cannot chip, craze, or crack. PermaSheen DeLuxe enables you to offer your clients cabinet sinks of unquestioned quality, fine design, and expert workmanship at reasonable prices.

Write for Booklet for Architects and for Other Literature

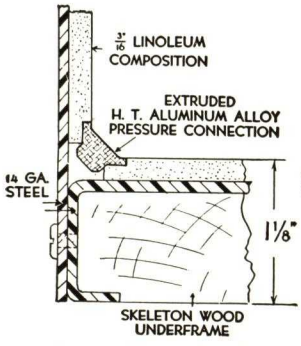
A Complete Line of Cabinet Sinks and Tops for Built-in Kitchen Cabinet Units in All Types All Sizes, to Fit any Space

LINOLEUM COMPOSITION PermaSheen CABINET SINKS AND TOPS

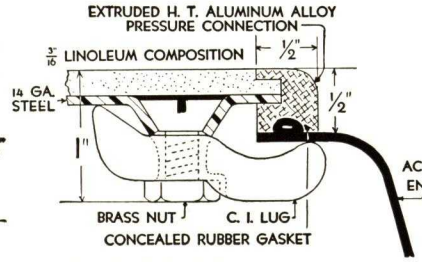
(U. S. Patent Nos. 2038637, 2038638, 2038668.)



Detail Through Sink Bowl



Detail of Back Splasher



Detail of Bowl Connection

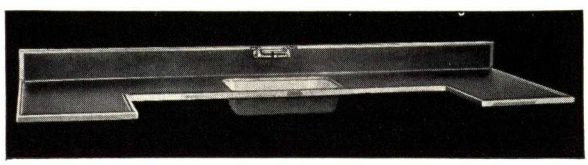
ARCHITECTURAL SPECIFICATIONS

PermaSheen Imperial Linoleum Composition Cabinet Sinks and Tops—Sink shall be *Tracy PermaSheen Imperial.* Drainboards to be 3/16-in. linoleum composition on a 14-gauge steel base; outside edges of linoleum to be held securely to steel base with stainless steel trim which shall form a pressure joint between the linoleum and the steel base; stainless steel trim shall have a raised bead to prevent overflow of water from the drainboards and shall be rabbeted into the linoleum to form a flush joint. Bowl(s) shall be [12x18x6½ in.] [16x22x6¾ in.] [16x28x6¾ in.] [18 in. round x 8 in.] of acid-resisting enamel and shall be fastened to the drainboards with a watertight joint by means of a rubber gasket compressed into a recess of a special extruded shape which shall be rabbeted into the linoleum of the drainboards, and shall hold the linoleum securely to the steel base around the edge of the bowl.

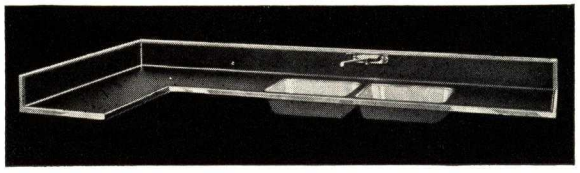
REASONABLY PRICED

PermaSheen Imperial Cabinet Sinks and Tops are reasonably priced and bring within the reach of your clients cabinet sinks and tops of unquestioned quality, fine design, and expert workmanship. Work surfaces are solid material and will not chip, craze or crack. These sinks are obtainable in the following colors: Black, Gray, Brown, Terra Cotta, Evergreen, Chocolate, Marbleized Black, Taupe Jaspe, Driftwood Gray Jaspe, Steel Gray Jaspe, Malay Brown Jaspe, Autumn Brown Jaspe, and Hunter Green Jaspe. You can offer PermaSheen Imperial to your clients with assurance of complete satisfaction.

Write for Booklet for Architects and for Other Literature.



U-Shape Perma Sheen Imperial



L-Shape Perma Sheen Imperial

ELKAY MANUFACTURING COMPANY

4704-4714 Arthington Street, CHICAGO, ILLINOIS

ELKAY REPRESENTATIVES

ATLANTA, GA., Robert E. Holcombe, 205 Walton Bldg.
BALTIMORE, MD., Richard B. Fulton, 12 W. Madison St.
BOSTON, MASS., Harry Adelson, 44 School St.
BUFFALO, N. Y., L. J. Drescher, 856 Amherst St.
CINCINNATI, OHIO, Calvin C. Huenefeld, 626 Broadway
CLEVELAND, OHIO, Alfred W. Avery, 1900 Euclid Ave.
DETROIT, MICH., Hugo C. Schwan, 2457 Woodward Ave.
HOUSTON, TEX., Thomas E. Price, 11 Oak Court
INDIANAPOLIS, IND., O. D. Waldon, 41 W. 28th St.
JACKSON, MISS., H. M. Ludlow, 119 Roach St.
KANSAS CITY, MO., Harry F. Sunderland, P. O. Box 2494
LOS ANGELES, CAL., William J. Long, 2237 Rogers Ave.
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MILWAUKEE, WIS., Byron F. Stickler, 1621 No. Franklin Pl.
MINNEAPOLIS, MINN., C. G. Herbert, 253 Plymouth Bldg.
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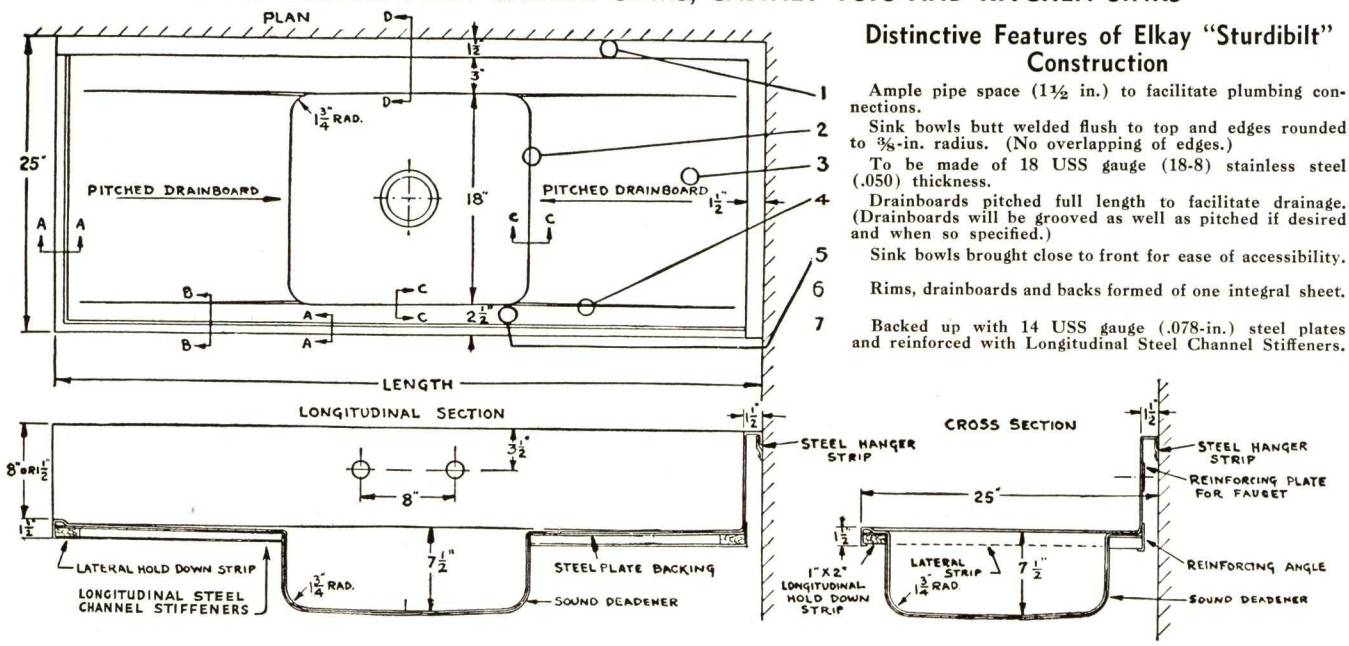
ST. LOUIS, MO., Arthur F. Becker, 305 Buder Bldg.
WASHINGTON, D. C., R. Harvey Stacy, 1673 Columbia Rd., N. W.

FOREIGN REPRESENTATIVES

A. TORRES, Export Sales Manager, 1718 No. Damen Ave., Chicago, Ill. GENERAL ENGINEERING SUPPLY SERVICE, Rooms 2-3, Noa Bldg., San Juan, P. R.

ELKAY CUSTOM BUILT CABINET SINKS, CABINET TOPS AND KITCHEN SINKS

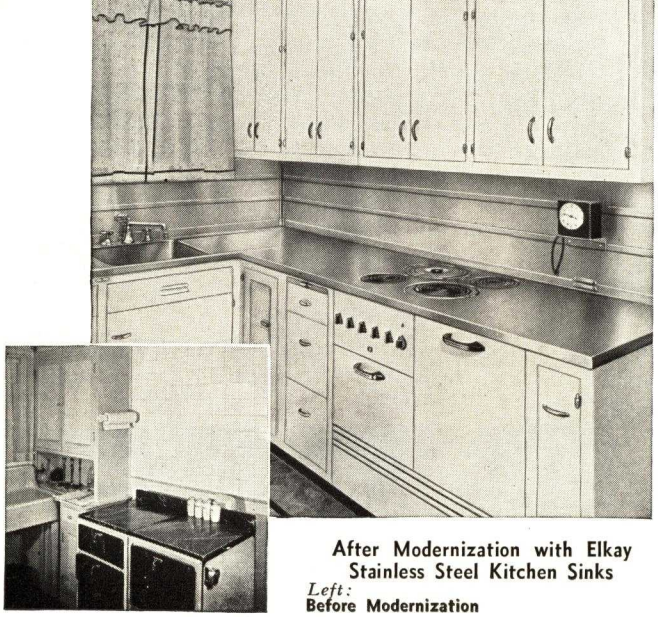


Distinctive Features of Elkay "Sturdibilt" Construction

1. Ample pipe space (1½ in.) to facilitate plumbing connections.
2. Sink bowls butt welded flush to top and edges rounded to ⅜-in. radius. (No overlapping of edges.)
3. To be made of 18 USS gauge (18-8) stainless steel (.050) thickness.
4. Drainboards pitched full length to facilitate drainage. (Drainboards will be grooved as well as pitched if desired and when so specified.)
5. Sink bowls brought close to front for ease of accessibility.
6. Rims, drainboards and backs formed of one integral sheet.
7. Backed up with 14 USS gauge (.078-in.) steel plates and reinforced with Longitudinal Steel Channel Stiffeners.

ELKAY CABINET SINKS, CABINET TOPS AND KITCHEN SINKS BUILT TO FIT ANY REQUIREMENT

Elkay "Sturdibilt" Cabinet Sinks, Cabinet Tops, and Kitchen Sinks have set a high standard in beauty of design, individuality, sturdy construction, and utility. In them are incorporated all the essential features which assure the utmost in lifetime service, sanitation, efficiency and cleanliness. The silvery, untarnishable, and stain-resisting stainless steel surfaces present a most pleasing appearance which harmonizes perfectly with any color scheme. They are custom built to fit any requirements and specifications.



After Modernization with Elkay Stainless Steel Kitchen Sinks

Left: **Before Modernization**

Suggestions for Architect's Specifications

Cabinet Sinks, Cabinet Tops, Sink Bowls and Kitchen Sinks to be of sizes and dimensions as shown on plans, and to be manufactured by ELKAY MANUFACTURING COMPANY, Chicago, Illinois, or equal; and to be fabricated as follows:

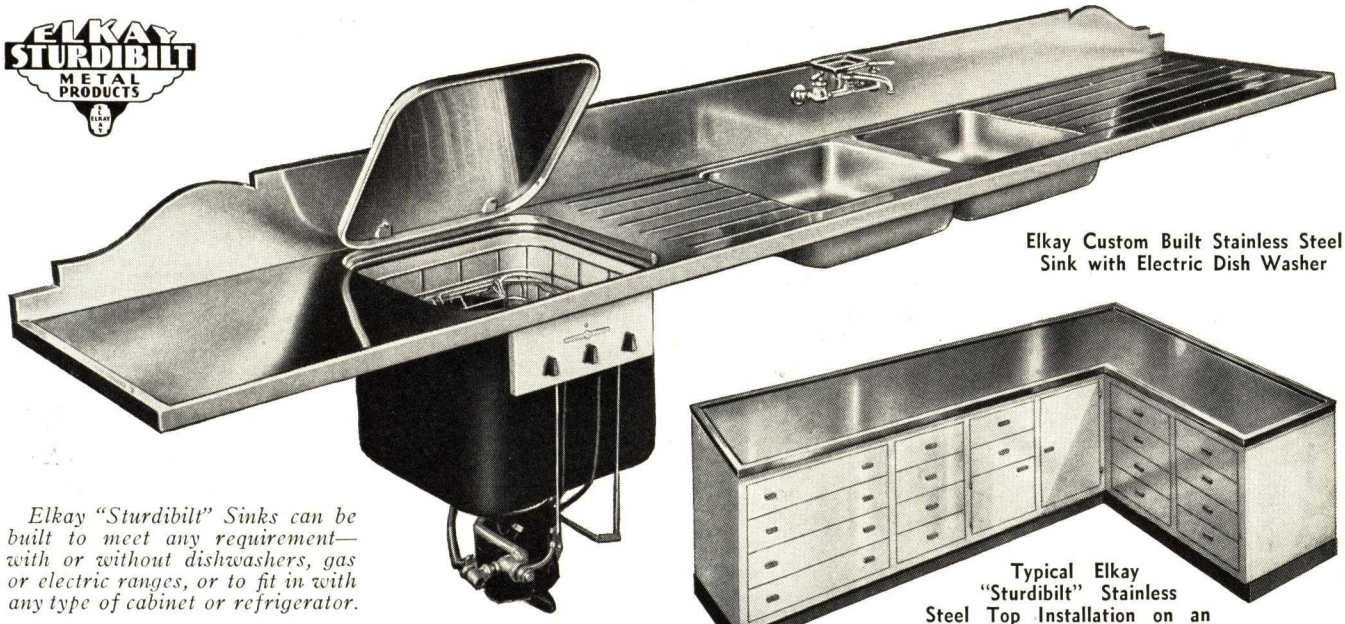
To be made of 18 USS Gauge (18-8) Stainless Steel (.050-in.) thickness, backed up with 14 USS Gauge (.078-in.) Steel Plates, making an over-all total thickness of not less than .128 in.* and reinforced with Longitudinal Steel Channel Stiffeners. Drainboards, rims and backs made integral of one sheet of metal. Drainboards in Cabinet Sinks to be pitched full length to sink bowl. (Drainboards may be grooved if desired and when so specified). Drainboards in Kitchen Sinks to be pitched and grooved full length to sink bowl. Sink bowl welded integral to drainboards, presenting invisible flush integral seam. Edge where sink bowl and drainboard meet, to be rounded to ⅜-in. radius (not sharp right angle.) Thickness of back to be not less than 1½ in. Distance from inside of sink bowl to outer edge of front rim to be not greater than 2½ in. (1½ in. on kitchen sinks). All corners of sink bowl (horizontal, lateral and vertical) to have 1¾-in. radius. All 18-8 Stainless Steel to have No. 4 (satin) polish.

*Sink bowls are sound deadened, but are not backed up with steel plates.

Catalog on Request

A number of Elkay "Sturdibilt" products are illustrated and described on the following pages. Our new Catalog "D" shows the entire line. Send for it today.

ELKAY CUSTOM BUILT CABINET SINKS, CABINET TOPS AND KITCHEN SINKS

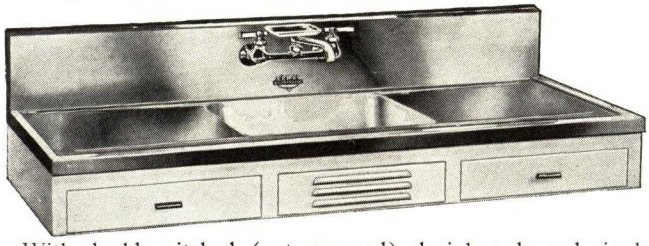


Elkay Custom Built Stainless Steel Sink with Electric Dish Washer

Elkay "Sturdibilt" Sinks can be built to meet any requirement—with or without dishwashers, gas or electric ranges, or to fit in with any type of cabinet or refrigerator.

Typical Elkay "Sturdibilt" Stainless Steel Top Installation on an "L" Shaped Steel Cabinet

Elkay "Sturdibilt" Stainless Steel Cabinet Sink CS 18



With double pitched (not grooved) drainboards and single bowl in center. Made of 18-gauge (.050-in.) thickness throughout. Drainboards will be grooved as well as pitched when so specified.

Width over all	Length over all	Sink bowl	Depth of bowl	Back
25″	48″ and longer	18″x20″*	7½″	8″

*Our 18″x25″ Bowl incorporated in fixtures 72″ and longer.
Can also be supplied with 1½-in. back. Can be supplied in any size to meet specifications.

Elkay "Sturdibilt" Stainless Steel Cabinet Sink CS 18 LB RE

With single pitched (not grooved) drainboard single bowl at left end and one return end back. Made of 18-gauge (.050-in.) thickness throughout. Drainboards will be grooved as well as pitched when so specified.

Width over all	Length over all	Sink bowl	Depth of bowl	Back
25″	48″ and longer	18″x20″*	7½″	8″

*Our 18″x25″ Bowl incorporated in fixtures 72″ and longer.
Can also be supplied with 1½-in. back. If required, return end may be on left-hand side or on both sides of top. Bowl may also be on right-hand side. Can be supplied in any size to meet specifications.

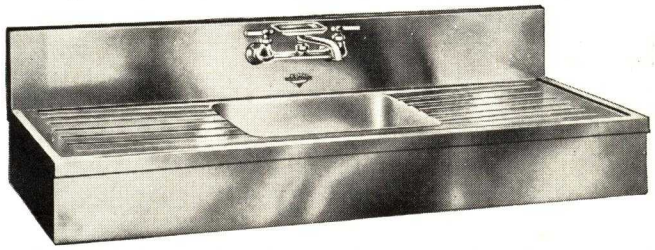
Elkay "Sturdibilt" Stainless Steel Cabinet Sink CS 28 BE

With double pitched (not grooved) drainboards and double bowl in center. Made of 18-gauge (.050-in.) thickness throughout. Drainboards will be grooved as well as pitched when so specified.

Width over all	Length over all	Sink bowl	Depth of bowl	Back
25″	72″ and longer	18″x42″*	7½″	8″

*Our 18″x52″ Bowl incorporated in fixtures 111″ and longer.
Can also be supplied with 1½-in. back. Can be supplied in any size to meet specifications.

Elkay "Sturdibilt" Stainless Steel Kitchen Sink KS 18



With double pitched and grooved drainboards and single bowl in center. Apron in front and ends. Made of 18-gauge (.050-in.) thickness throughout.

Width over all	Length over all	Sink bowl	Depth of bowl	Back
25″	48″ and longer	18″x20″*	7½″	8″

*Our 18″x25″ Bowl incorporated in fixtures 72″ and longer.
Can also be supplied with 1½-in. back. If required, return ends may be added to either side or both sides and bowl may be placed at either end. Can be supplied in any size to meet specifications.

ELKAY "STURDIBILT" SCULLERY SINKS

Elkay "Sturdibilt" Scullery Sinks are made of 12-gauge (⅛-in.) copper-bearing blue annealed steel. Can also be made of 10-gauge steel if so specified. Roll rim, front, bottom and back made of one sheet, coved at corners to prevent collection of grease and dirt. Ends are welded in.

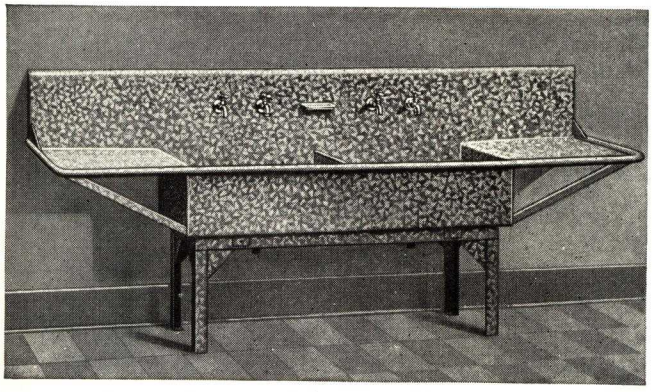
Supported on 2x2x⅛-in. steel angle legs with gusset plates arranged to fasten to floor. Legs are detachable for shipping.

Drilled for faucets, waste and overflow.

All hot dip galvanized after fabrication, insuring all edges against rust and corrosion.

Unless otherwise specified, all sinks will be set 32 in. floor to rim. (36-in. height optional.)

Can also be manufactured of 18-8 stainless steel.



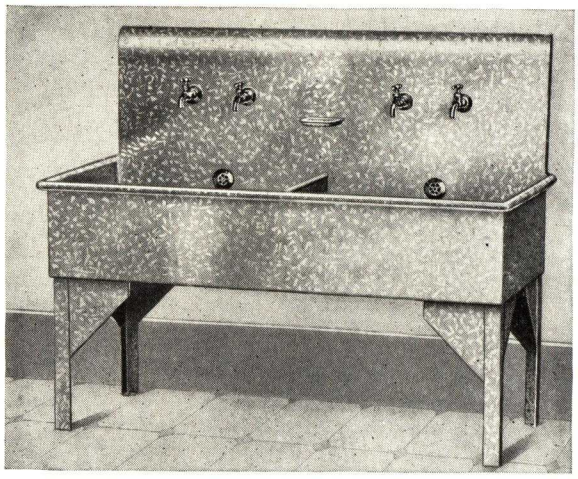
Elkay "Sturdibilt" Scullery Sink—60 DB

(Federal Specifications WW-P-541. August 1, 1933. E-5c. Fig. 26. Outfit S-108-D.)

Two-compartment, with roll rim on front and ends, integral drainboards and back, also soap dish, frame and legs.

Length of sink	Depth of sink	Height of back	Floor to rim	Length of drainboards
60″	12″	15″	36″	24″ each

Over all dimensions 2 ft. 3 in. x 9 ft. x 4 ft. 3 in. high. Special sizes made to order.



Elkay "Sturdibilt" Scullery Sink S-820

Two-compartment, with roll rim on front and ends and with 15-in. high integral back, with legs and soap dish.

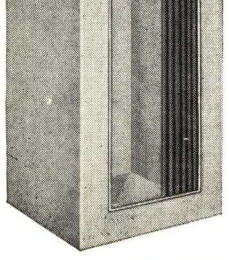
Length	Width	Depth	Back
30″ to 60″	24″	12″	15″

Measurements are inside and do not include roll rim, drainboards or boxed back. For over all dimensions add 2½ in. to length and 3 in. to width.

Special sizes made to order.

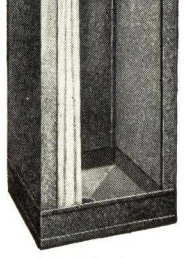
ELKAY "STURDIBILT" SHOWER BATH CABINETS

Elkay "Sturdibilt" Shower Bath Cabinets are made in four different models: The "Aristocrat," the "Commodor," the "Ambassador" and the "Junior." The Aristocrat and the Commodore are the "unit type" and the Ambassador and the Junior are the "knocked-down type." Each of these models has certain distinctive features which have made them a standard of efficiency, practicability and serviceability.



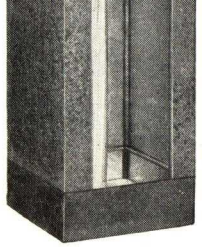
DIMENSIONS OF ARISTOCRAT AND COMMODORE SHOWER STALLS

Width	Depth	Height
28″	40″	72″
30″	32″	72″
32″	32″	72″
36″	36″	72″
40″	28″	72″



DIMENSIONS OF AMBASSADOR SHOWER STALLS

Width	Depth	Height
32″	32″	76″
36″	36″	76″



The Aristocrat

Made of 11-gauge (⅛-in. thick) copper-bearing sheet steel. Pilasters, sides and back are made of one continuous sheet, electrically welded to riser and receptor. Complete compartment includes Elkay mixing valve, chromium-plated and adjustable ball joint, cast brass, self-cleansing water saving shower head and arm, ¾-in. outside diameter chromium-plated brass curtain rod with flush type flanges, chromium-plated Universal type strainer for 2-in. lead, iron or soil pipe, chromium-plated soap dish. No curtain. Finished in two coats of metal paint. In finishing and decorating after installation, a good coat of waterproof enamel paint should be used.

The Commodore is identically the same as the Aristocrat, except that it is equipped with the two-valve shower instead of the Mixing Valve.

The Junior

The J-30 "Junior" is a completely equipped, self-contained cabinet combining economy of space, low installation cost and efficiency in operation. It can be easily and quickly installed in any room, closet or space in the home or building where water supply lines and waste pipes are available.

The J-30 "Junior" shower bath stall is crated in "knocked-down" sections.

The walls are galvanized copper-bearing steel, prepared for enamel or duco finish. The receptor or base is heavy gauge copper-bearing steel, hot galvanized after fabrication and chemically treated in preparation for enamel or duco finish.

Complete compartment includes satin finish chromium-plated brass two-valve shower with adjustable ball joint, self-cleansing, water saving shower head and arm, waste strainer, soap dish and white duck curtain. Junior stalls come in one size only—30x30x76 in.

The Ambassador

"The Ambassador" is a high quality product throughout and yet inexpensive in original cost, installation and upkeep. It is shipped crated, unassembled and can be installed and assembled in a space no larger than the stall itself.

The walls are galvanized, copper-bearing steel, prepared for enamel or duco finish. Receptor or base is heavy gauge copper-bearing steel, hot galvanized after fabrication and chemically treated in preparation for enamel or duco finish. The receptor is of the inverted type.

Complete compartment includes chromium-plated brass two-valve shower, adjustable ball joint, self-cleansing, water saving shower head, curtain rod, waste strainer, soap dish and white duck curtain. Ambassador and Junior shower stalls can be supplied in baked enamel or Duco finish.

For complete specifications, write for Shower Bath Cabinet Catalog "D".

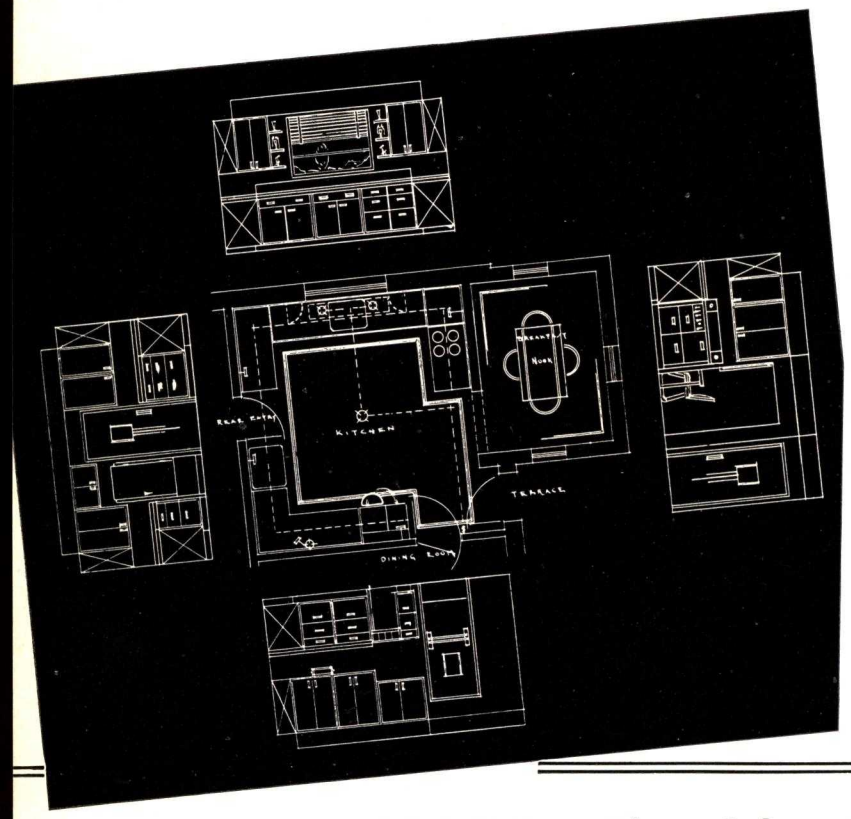
28
19

WHITEHEAD

Work-Saving Kitchens

WHITEHEAD METAL PRODUCTS CO., OF NEW YORK, INC.

. . Take Advantage of the WHITEHEAD KITCHEN PLANNING SERVICE . .



The Building Trades are invited to make full use of our Kitchen Planning Service. Send us rough sketches of any kitchens you are creating, with some indication as to budget limitations. Our Kitchen Planning Staff will study them and submit finished drawings to you similar to the one at the left, complete with bills of material and every detail worked out for construction. There is no charge for this service.

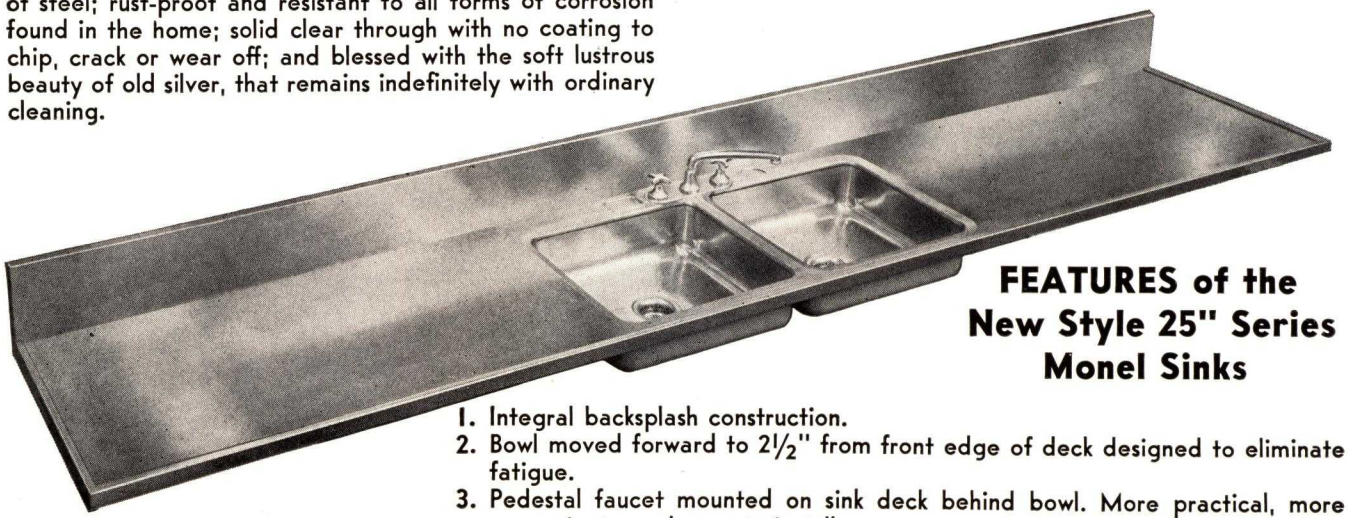
MONEL—The Ideal Kitchen Metal

Whitehead kitchens are "Work-Saving" kitchens first of all because of Monel, a natural alloy of two-thirds Nickel and one-third Copper. Monel is especially suited to sink and work surface construction, and as such is the natural material for the reduction and prevention of unnecessary kitchen labor.

It is extremely durable, with the strength and toughness of steel; rust-proof and resistant to all forms of corrosion found in the home; solid clear through with no coating to chip, crack or wear off; and blessed with the soft lustrous beauty of old silver, that remains indefinitely with ordinary cleaning.

Monel sinks are resilient enough to soften impacts and thus reduce dish breakage. Moreover, dish clatter is reduced to a minimum.

Monel stands the ravages of exposure and abuse and needs no careful treatment. The usual household cleansers will keep Monel bright and clean with the care ordinarily given to kitchen equipment.



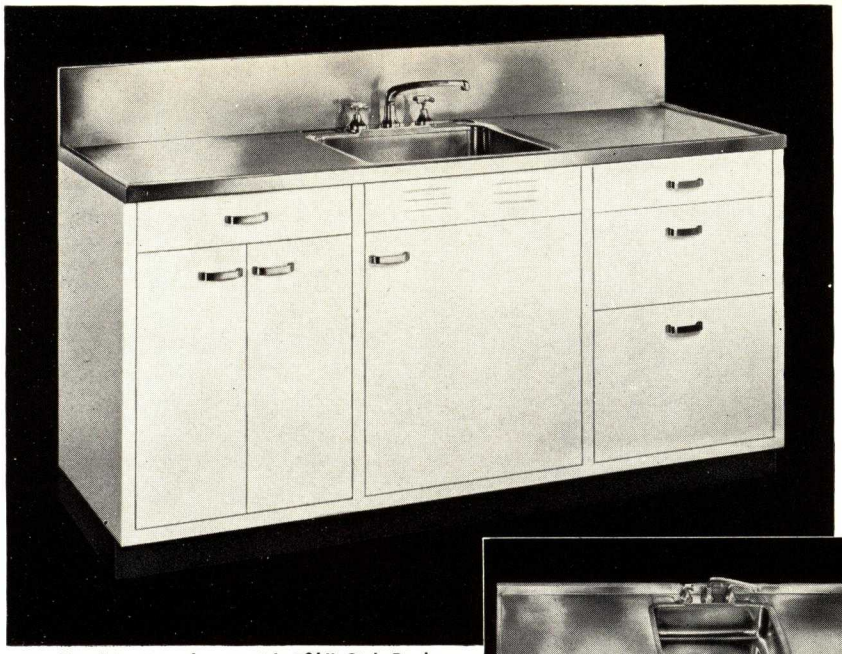
FEATURES of the New Style 25" Series Monel Sinks

1. Integral backsplash construction.
2. Bowl moved forward to 2½" from front edge of deck designed to eliminate fatigue.
3. Pedestal faucet mounted on sink deck behind bowl. More practical, more convenient—and easy to install.
4. Soap dish, glass holder and faucet platform pressed right in sink deck.
5. Flare around bowl insures against water collecting around top edge of sink.

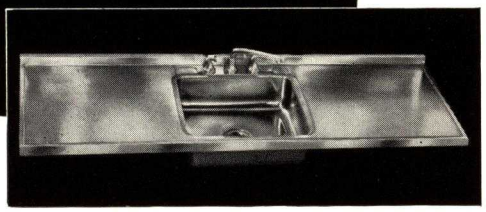
Whitehead Metal Products Co., of New York, Inc.

25" SERIES SINGLE BOWL

Monel Sink and Steel Base Cabinet Combinations



Combination shown with 7¾" Sink Back.



Top view of Sink only, shown with 1¼" Sink Back.

Sinks Are Available Without Base Cabinets. To Order, Omit Prefix "PK"

Sizes and Dimensions

Model Number	Actual Overall			Length of Sink Bowl B	Length of Drainboards C
	Width	Length A	Height		
PKC 2048L†	25	48	36	20	26¼
PKC 2048R†	25	48	36	20	26¼
PKC 2060	25	60	36	20	20
PKC 2072	25	72	36	20	26
PKC 2584	25	84	36	25	29½
PKC 2596	25	96	36	25	35½
PKC 25108	25	108	36	25	41½
PKC 25120	25	120	36	25	47½
PKC 25126	25	126	36	25	50½
PKC 25132	25	132	36	25	53½
PKC 25144	25	144	36	25	59½
PKC 25156	25	156	36	25	65½
PKC 25168	25	168	36	25	71½

†Suffix L or R following 2048 Series signifies Left or Right drainboard.
Sinks available with 7¾" or 1¼" backs. Please specify.
Sinks available with one or two end splashers if desired.
Crumb-cup strainer with Monel basket standard equipment.
Intermediate sizes of above Sinks and Combinations available at slight extra cost.

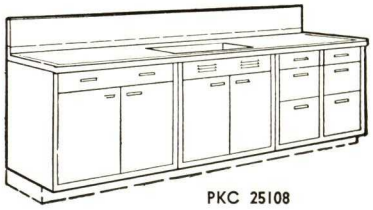
PKC 2048R

PKC 2060

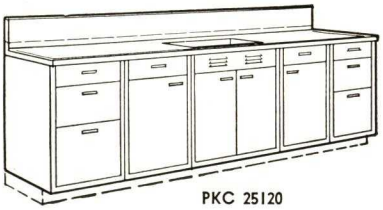
PKC 2072

PKC 2584

PKC 2596



PKC 25108



PKC 25120

PKC 25126, 25132, 25144, 25156 and 25168

ARCHITECT'S SPECIFICATIONS—SINGLE AND DOUBLE BOWL 25" SERIES

Gauge—Shall be Monel: 19 ga. USS (043") for bowls and 20 ga. USS (037") for drainboards (reinforced with steel) and back splashers.

Assembly—One piece (single or double, specify which) bowl shall be welded to adjacent drainboards and sealed with matching solder on inside flange. Welds shall be invisible, solid and finished to perfect smoothness. Back splashers shall be integral with deck (specify either 1½" or 8" high). Bead or front and side rims shall be $\frac{5}{16}$" high.

Reinforcing—Decks shall be backed up with 16 ga. USS (.062") steel channels running full length of sink in front and rear of bowl(s) and from either side of bowl to ends. No wood construction.

Sound-Deadening—Entire underbody shall be thoroughly coated with special compound to seal and sound-proof all surfaces.

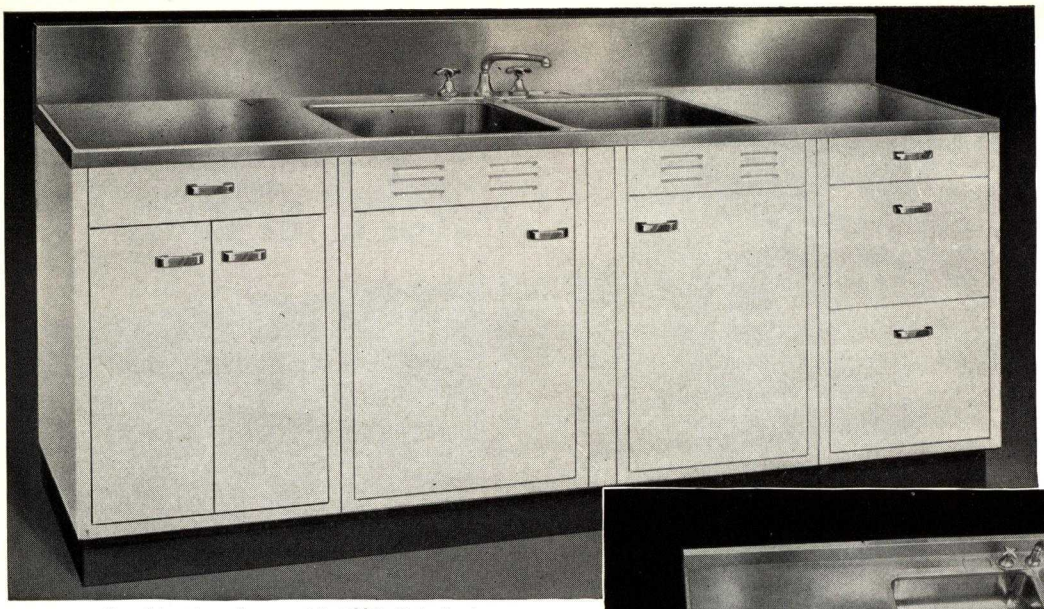
Design—Drainboards shall afford maximum work surfaces. Drillings through deck to accommodate pedestal faucet. Raised faucet platform, soap dish and glass holder depressions shall be stamped in deck. Flare 1" wide, ¼" deep around bowl shall be provided.

Finish—All visible surfaces of sinks shall have special satin finish.

Strainer—Crumb cup strainer and basket of Monel Metal shall be supplied. (see page 7).

For Base Cabinet Specifications, see page 8. For faucet and faucet roughing-in measurements, see page 5.

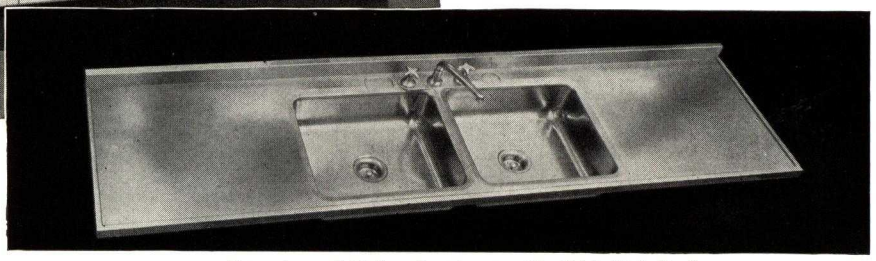
For Roughing-in Measurements for Single and Double Bowl Models—25" Series—See page 4.



Combination shown with 7¾" Sink Back.

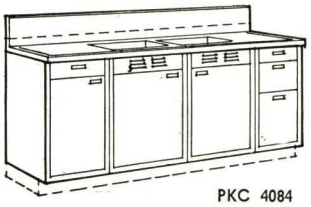
25" SERIES DOUBLE BOWL

Monel Sink and Steel Base Cabinet Combinations



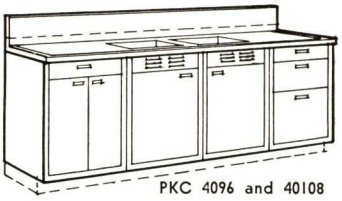
Top view of Sink only, shown with 1¼" Sink Back.

Sinks Are Available Without Base Cabinets. To Order, Omit Prefix "PK"

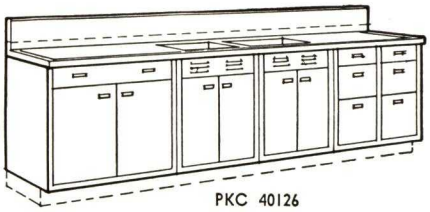


PKC 4084

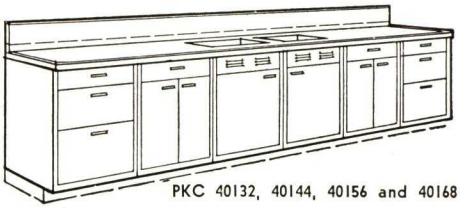
PKC 40120



PKC 4096 and 40108

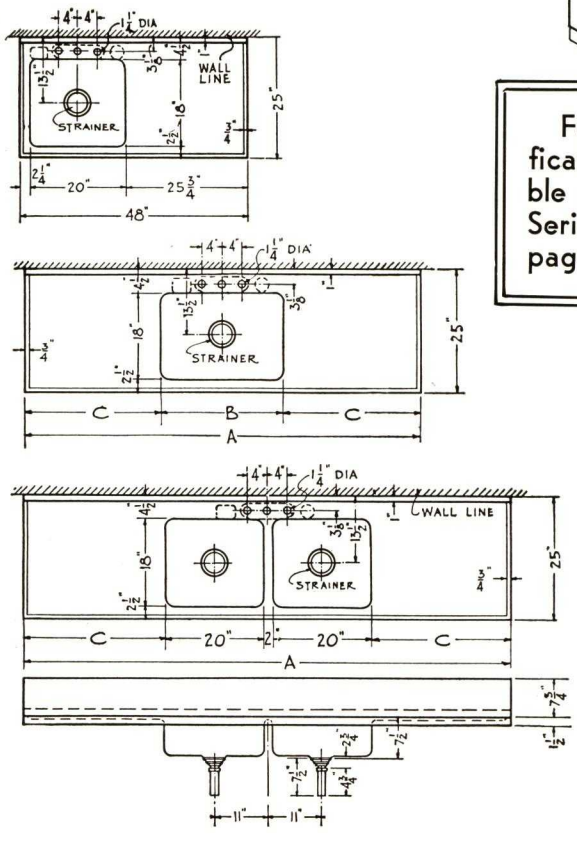


PKC 40126



PKC 40132, 40144, 40156 and 40168

Roughing-In Measurements Single and Double Bowl Models— 25" Series



For Architect's Specifications Single and Double Bowl Models — 25" Series — See preceding page.

Sizes and Dimensions

Model Number	Actual Overall Width	Actual Overall Length A	Actual Overall Height	Length of Sink Bowls B	Length of Drainboards C
PKC 4084	25	84	36	20 each	21
PKC 4096	25	96	36	20 "	27
PKC 40108	25	108	36	20 "	33
PKC 40120	25	120	36	20 "	39
PKC 40126	25	126	36	20 "	42
PKC 40132	25	132	36	20 "	45
PKC 40144	25	144	36	20 "	51
PKC 40156	25	156	36	20 "	57
PKC 40168	25	168	36	20 "	63

Sinks available with 7¾" or 1¼" backs. Please specify.
Sinks available with one or two end splashers if desired.
Crumb-cup strainers with Monel baskets standard equipment.
Intermediate sizes of above Sinks and Combinations available at slight extra cost.

For Base Cabinet Specifications, see page 8. For faucet and faucet roughing-in measurements, see page 5.

25" SERIES
Monel Sink and Steel Base Cabinet Combinations

Adapted for General Electric Dishwasher and Disposall
(Single Bowl Only)

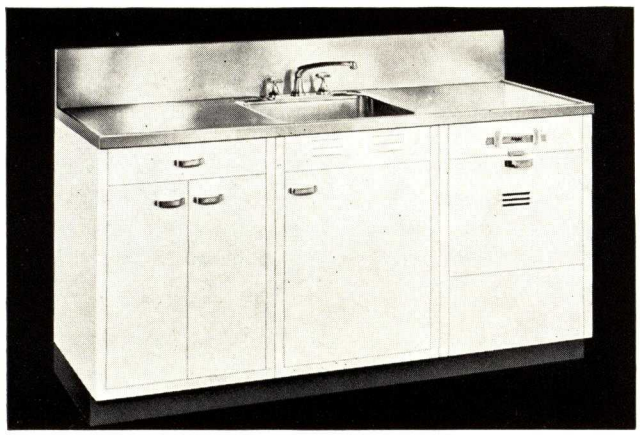
Whitehead has adapted its line of 25" Monel Sinks and Steel Base Cabinets to accommodate General Electric Dishwasher and Disposall Units. Standard Sinks and Sink and Cabinet Combinations are available in the following lengths — 48, 63, 72, 84, 96, 108, 120, 126, 132, 144, 156 and 168 inches. Sinks are ordered as GEC units and Combinations as GEPKC units.

Sinks are furnished with opening for dishwasher unit and cover and large drain opening for connection with Disposall unit. If Disposall is not desired, crumb cup strainer should be ordered from General Electric. The 48" sink has no drainboard, the 63" and 72" sinks have one drainboard to right of bowl, and all other sinks have equal double drainboards. In cabinet combinations, the 20" sink bowl and the dishwasher opening take a special 48" sink front unit (GEDWC48) (see top picture) which forms the basis of all cabinet combinations.

Adapted for Westinghouse Dishwasher
(Single and Double Bowl)

Whitehead has also adapted its line of 25" Monel Sinks and Steel Base Cabinets to accommodate the Westinghouse Dishwasher. These sinks, both single and double bowl, are the same as the regular Monel sinks shown on pages 3 and 4 with the exception that Westinghouse Sinks are not furnished with raised faucet platform and indented soap depression and flare around bowl. Sink decks are drilled for Westinghouse Dishwasher water inlet. Sinks should be ordered as WC units and Combinations as WPKC units. They are available in all sizes as shown on pages 3 and 4 and all dimensions are the same with the exception of the 60" single bowl and the 84" double bowl models which have left hand drainboards shorter than the right hand.

Arrangement of cabinets in combinations are different than standard combinations as a 24" Dishwasher is placed to the right of sink bowl and cabinets are combined to form a symmetrical arrangement.



Adapted for Hotpoint Dishwasher
(Single and Double Bowl)

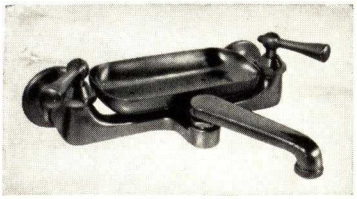
Whitehead has also adapted its line of 25" Monel Sinks and Steel Base Cabinets to accommodate the Hotpoint Dishwasher. These sinks are exactly the same as the standard single and double bowl sinks shown on pages 3 and 4, and are, therefore, available in the same sizes and have the same dimensions with the exception of the 60" single bowl and the 84" double bowl models where the left hand drainboard is shorter than the right hand. However, Hotpoint Sinks should be ordered as HC units and combinations as HPKC units.

Cabinet arrangements of combinations are the same as Westinghouse combinations, as a symmetrical cabinet arrangement is formed with 24" Hotpoint Dishwasher to the right of the bowl.

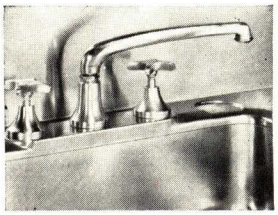
In all dishwasher sinks standard backsplasher heights are 1¼" and 7¾". Intermediate back heights are also available. Intermediate sizes of these sinks and combinations available at slight extra cost.

SINK ACCESSORIES

Crumb Cup Strainer with Monel Basket is standard equipment with all Whitehead Monel Sinks.



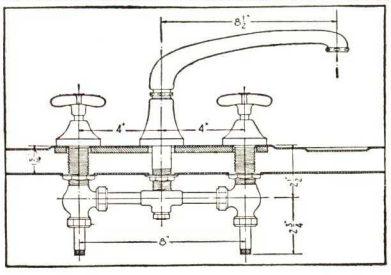
Specially designed for the 21" series Monel Cabinet Sinks and Straitline Apron Sinks, the Graceline faucet is constructed of 20% solid nickel silver with satin finish.



The Pedestal Faucet is specially designed for the 25" wide series Monel Sinks, its beautiful satin chromium finish blending harmoniously with the Monel.

Pedestal Faucet with Hose Spray Connection is available. Plunger on faucet diverts water to spray as needed.

Roughing-in measurements of pedestal type faucet are indicated at right. Installation of hose spray connection is essentially the same with extra drilling at right of faucet for hose.



Combination shown with 7¾" Back.

21" SERIES

Single and Double Bowl Monel Sink and Steel Base Cabinet Combinations

Top view of Sink only, shown with 1¼" Back.

Sinks Are Available Without Base Cabinets. To Order, Omit Prefix "PK"

PKWA 1041R

PKWA 1050R

PKWA 1060

PKWA 1072

PKWA 1082

Sizes and Dimensions

Model Number	Actual Overall			Length of Sink Bowl C	Length of Drain-boards D
	Width A	Length B	Height		
PKWA 1041L†	21	41	36	20	19¼
PKWA 1041R†	21	41	36	20	19¼
PKWA 1050L†	21	49½	36	25	22¾
PKWA 1050R†	21	49½	36	25	22¾
PKWA 1060	21	60	36	20	20
PKWA 1072	21	72	36	25	23½
PKWA 1082*	21	82	36	20 ea.	20

†Suffix L or R signifies Left or Right drainboard.
*Double bowl model.
Sinks available with 7¾" or 1¼" backs. Please specify.
Sinks available with one or two end splashers if desired.
Crumb-cup strainers with Monel baskets standard equipment.
Intermediate sizes of above Sinks or Combinations NOT AVAILABLE.

ARCHITECT'S SPECIFICATIONS
21" Series (Single and Double Bowl) and Straitline Apron Models

Gauge—Shall be Monel; 19 ga. USS (043") for bowls and 20 ga. USS (037") for drainboards (reinforced with steel) and back splashers.

Assembly—One piece (single or double, specify which) bowl shall be welded to adjacent drainboards and sealed with matching solder on inside flange. Welds shall be invisible, solid and finished to perfect smoothness. (1½" back splasher shall be integral.) Additional height to make 8" shall be a separate back splash bolted to integral back splash.

Reinforcing—Entire length of sink is reinforced with steel Z bar. Drainboards are backed up with 16 gauge (062") steel bonded to underside of Monel.

Sound-Deadening—Entire underbody shall be thoroughly coated with special compound to seal and sound-proof all surfaces.

Design—Drainboards shall be grooved and faucet drilling through back splash to accommodate any standard 8" center faucet.

Finish—All visible surfaces of sinks shall have special satin finish.

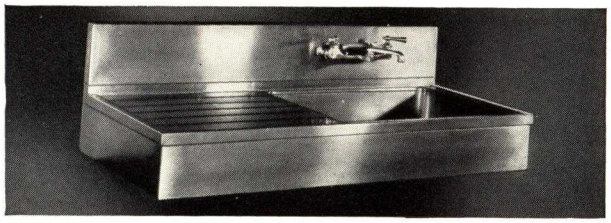
Strainer—Crumb cup strainer and basket of Monel shall be supplied. (see page 7).

For Base Cabinet Specifications, see page 8. For faucet, see page 5.

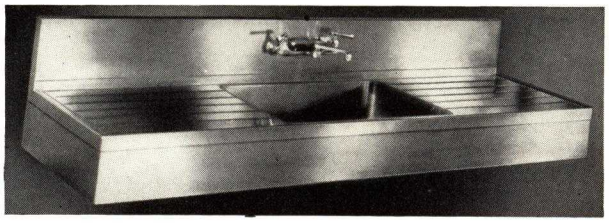
For Roughing-in Measurements—21" Series and Straitline Models, see next page.

MONEL APRON SINKS

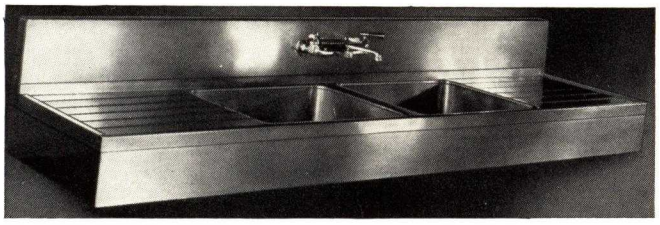
Straitline Models



Model Number	Nominal Size	Actual Over-all Width A	Actual Over-all Length B	Length of Sink Bowl C	Length of Drain-board D
Whitehead 1041 L	21"x41"	21"	41"	20"	19¼"
Whitehead 1041 R	21"x41"	21"	41"	20"	19¼"
Whitehead 1050 L	21"x50"	21"	49½"	25"	22¾"
Whitehead 1050 R	21"x50"	21"	49½"	25"	22¾"

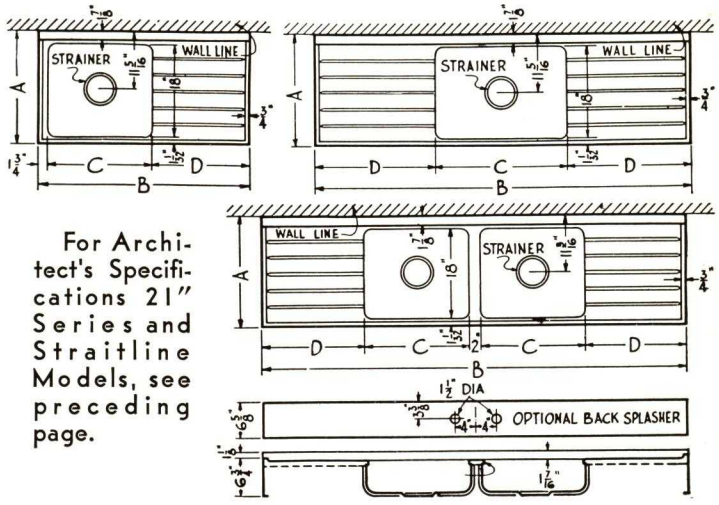


Model Number	Nominal Size	Actual Over-all Width A	Actual Over-all Length B	Length of Sink Bowl C	Length of Drain-board D
Whitehead 1060	21"x60"	21"	60"	20"	20"
Whitehead 1072	21"x72"	21"	72"	25"	23½"



Model Number	Nominal Size	Actual Over-all Width A	Actual Over-all Length B	Length of Sink Bowl C	Length of Drain-board D
Whitehead 1082	21"x82"	21"	82"	20"	20"

Roughing-In Measurements—21" Series and Straitline Apron Models



For Architect's Specifications 21" Series and Straitline Models, see preceding page.

MONEL SINK BOWLS

Single seamless drawn Monel Sink Bowls are available in two sizes, 18" x 20" and 18" x 25"; all dimensions being inside measurements. All corners of bowl are rounded and bottoms are coved. Width of flange is 5/8" or 1/2" all around. Thickness of material, 19 gauge USS (.043").

Double Monel Sink Bowls are available in one size only; each bowl being 18" x 20" with a 2-inch partition between.

MONEL CABINET TOPS

Monel Cabinet Tops are designed to give a continuous working surface from range or refrigerator to Sink Center.

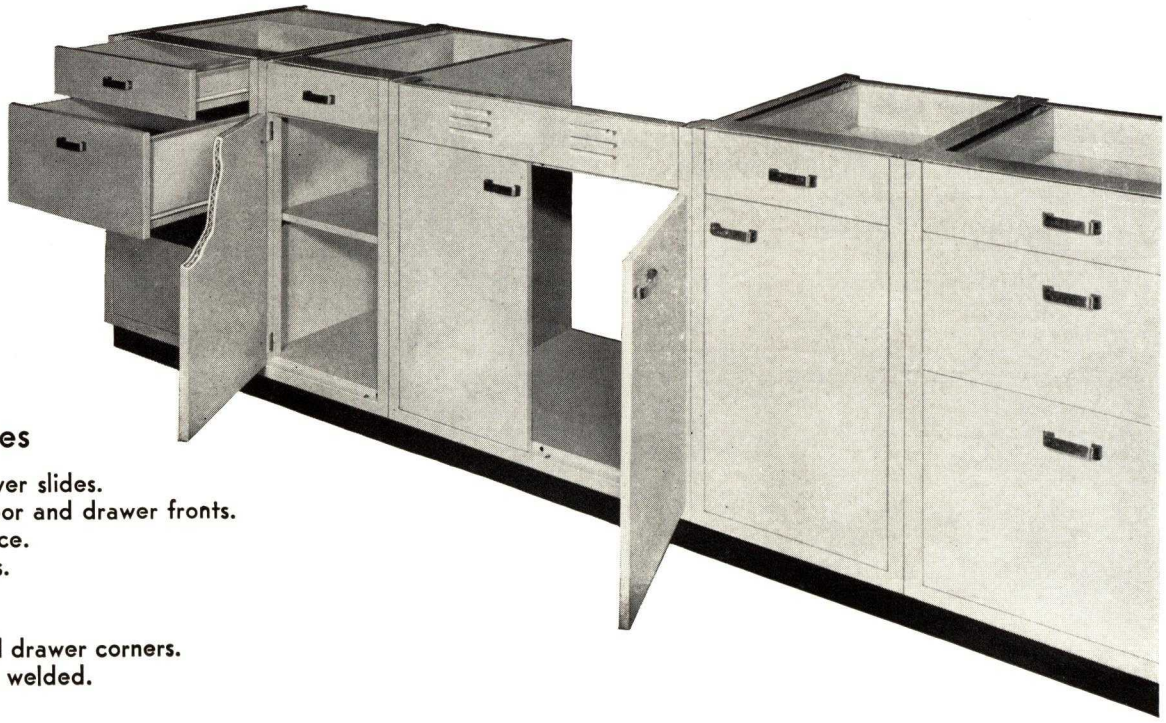
Base Cabinets for use under Cabinet Tops CT-15 to CT-36 shown on page 9. Base Cabinets for CT-42 to CT-114 are composed of any desired possible combination of cabinets shown on page 9. All Cabinet Tops are furnished with flat surface, unless specified to have a bead.

Sizes and Dimensions

Model Number	Actual Size Width	Actual Size Depth
CT 15	15	25
CT 18	18	25
CT 21	21	25
CT 24	24	25
CT 30	30	25
CT 36	36	25
CT 42	42	25
CT 48	48	25
CT 60	60	25
CT 72	72	25
CT 108	81	25
CT 114	96	25
CT 84	108	25
CT 96	114	25

Intermediate sizes of cabinet tops available at slight extra cost.
Height of apron, 1½ inches.
Total height of back, 1½ inches.
Furnished with 1¼" or 7¾" backsplashers, or without backsplashers. Specify which.

WHITEHEAD STEEL CABINETS



Features

1. Anti-friction drawer slides.
2. Fully insulated door and drawer fronts.
3. Recessed toe space.
4. Concealed hinges.
5. Bullet catches.
6. Rubber bumper.
7. Welded door and drawer corners.
8. All frame corners welded.
9. Monel hardware.

Specifications

Material—All kitchen cabinets shall be manufactured of highest grade, cold rolled furniture steel, free from rust and defects, 20 gauge throughout.

Construction—Cabinets shall be flush type with doors and drawer heads recessed between supporting stile members, 1¼" wide, giving an entirely smooth front. All parts of cabinets shall be spot welded. Front corners mitered, reinforced, with continuous welded joints. Top and bottom of wall cabinets to be constructed flush with lap joint.

Backs shall be recessed 13/16" on wall and base cabinets, allowing wood grounds (furnished) for anchoring.

Shelves shall be of one-piece steel, flanged, removable and adjustable on ½" centers. Brackets for supporting shelves shall be nickel plated, and have ¾" bearing surface.

Doors and drawer heads shall be 11/16" thick of double wall construction, flush both sides and filled with sound-absorbing material.

Drawers in base cabinets shall be equipped with anti-friction, EZ slides, with suspensions of 16 gauge hardened steel.

Drawers in base cabinets shall be constructed to accommodate such accessories as bread boxes, flour bins, etc. All drawers equipped with positive stop and both doors and drawers with rubber bumpers.

Optional—Wall cabinets may be furnished with glass doors set in rubber, in place of flush doors, at slight additional cost.

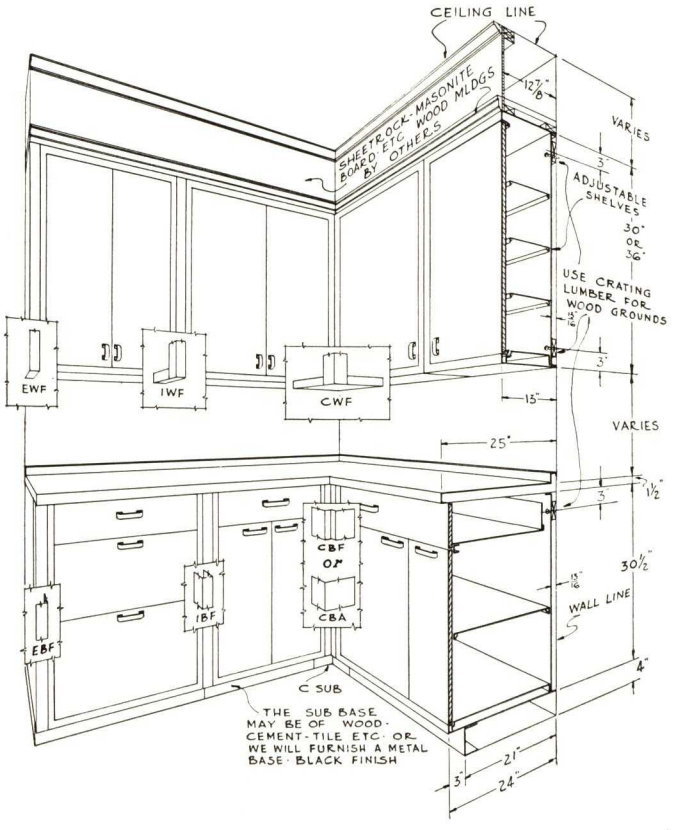
Finish—After cabinets are fabricated, all joints and welds shall be sanded and cabinets efficiently de-greased, assuring an entirely clean and rust-free base metal.

All cabinets shall be sanded before prime finish coats are applied. Highest grade synthetic enamels shall be used and baked on at 300°F. producing a glossy and extremely durable wearing surface.

Hardware—Hinges shall be of concealed type with fixed stops. Pulls shall be of modernistic design, constructed of Monel. Bullet catches shall be supplied at both top and bottom of all doors. Locks are available at slight extra cost.

The Sub-base may be of wood, tile, etc., or we can furnish a metal base — black finish 4" high set back 3".

Standard Filler Erection Details



..STEEL BASE CABINETS..

Whitehead Steel Base Cabinets are ideal for storing bulk staples and every type of kitchen utensil.

Furnished individually in six different widths in both "All Drawer" and "Cupboard" style, these Units "team-up"—in appearance and in utility—with whatever make of modern range and refrigerator you possess. Standard colors are Cameo Ivory, White, Light Green and Dark Ivory.

Drawers are so constructed that accessories such as flour and meal bins, etc., may be inserted.

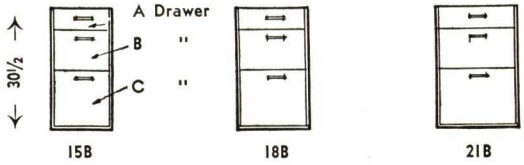
All Base Cabinets are 30½ inches high so that, when assembled with recessed sub-base and Monel Cabinet Top, their working surface shall be the ideal working height—36 inches—same as the Monel Sink and Cabinet Units which they also match in depth.

Available With or Without Cabinet Tops. (See page 7).

Specify whether with or without sub-base; with or without Monel Cabinet top; or whether left, or right hinge on single door units.

"ALL DRAWER STYLE"—24" Depth

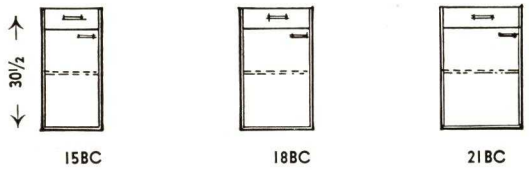
Model Number	Dimensions of Cabinet Alone		
	Width	Depth	Height
15B	15	24	30½
18B	18	24	30½
21B	21	24	30½
24B	24	24	30½
30B	30	24	30½
36B	36	24	30½



Drawer Cabinets available with varied combinations at slight additional cost.
i.e., Two "A" Drawers substituting One "B" Drawer.
Three "A" Drawers substituting One "C" Drawer.

"CUPBOARD STYLE"—24" Depth

Model Number	Dimensions of Cabinet Alone		
	Width	Depth	Height
15BC	15	24	30½
18BC	18	24	30½
21BC	21	24	30½
24BC	24	24	30½
30BC	30	24	30½
36BC	36	24	30½



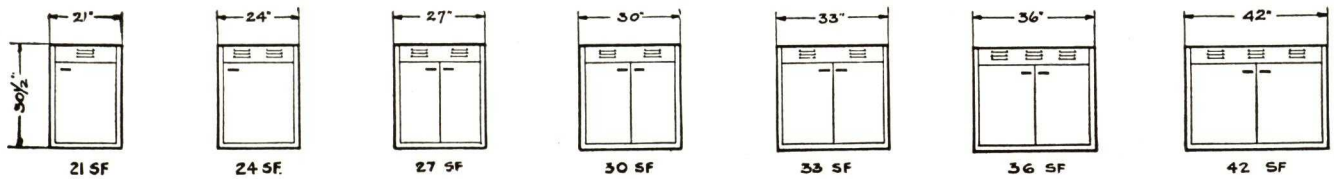
Furnished With One Adjustable Shelf

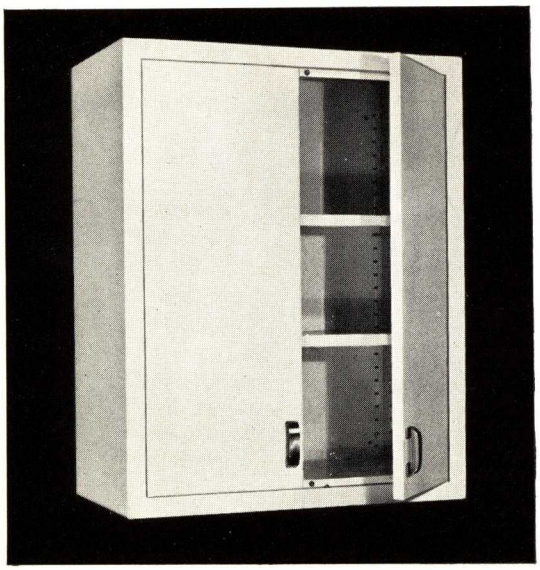
Steel Sink Fronts

Arrangements of undersink cabinets for all standard size cabinet sink combinations are illustrated on pages 3, 4 and 5. In any assemblage of undersink cabinets for odd size standardized sinks (25" wide series), or special size and shape custom-built sinks, the size of Sink Front is determined by the overall length of bowl or bowls.

The illustrated range of sizes if properly combined with base cabinets and fillers will meet any undersink cabinet requirements.

Sink Fronts are not cabinets but fronts only and are used to conceal plumbing and to complete sink base cabinet assembly. Bottom plates, however, are available. For Sink Front Cabinet, see page 11.

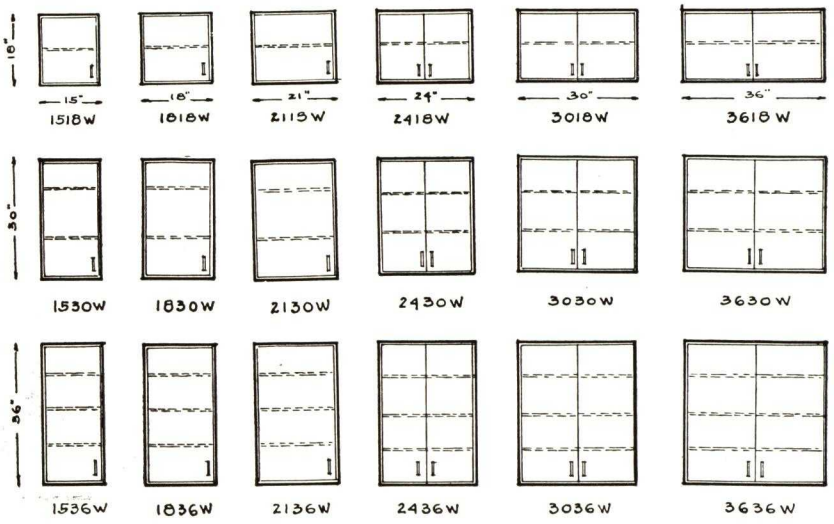




. . STEEL WALL CABINETS . .

Whitehead Steel Wall Cabinets form an integral and necessary part of all kitchen work-centers. Adaptable as they are to all sizes of canned goods and staples, glasses and dishware (for shelves are adjustable at 1/2" intervals), these light, but strong cabinets form convenient storage space directly above range, refrigerator, and sink and intermediate working-surface.

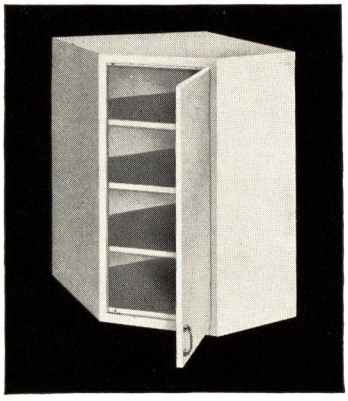
Construction is of finest grade furniture steel, fully finished on all sizes in either Cameo Ivory, White, Light Green or Dark Ivory, Hinges are concealed. Handles are Monel—of modern design—and attached at just the right and most convenient height desired.



Sizes and Dimensions

Number	Width	Height	Number	Width	Height
1518 W	15	18	2430 W	24	30
1818 W	18	18	3030 W	30	30
2118 W	21	18	3630 W	36	30
2418 W	24	18	1536 W	15	36
3018 W	30	18	1836 W	18	36
3618 W	36	18	2136 W	21	36
1530 W	15	30	2436 W	24	36
1830 W	18	30	3036 W	30	36
2130 W	21	30	3636 W	36	36

All Wall Cabinets 13 inches in depth.
Specify Left or Right Hinge on Single Door Cabinets.

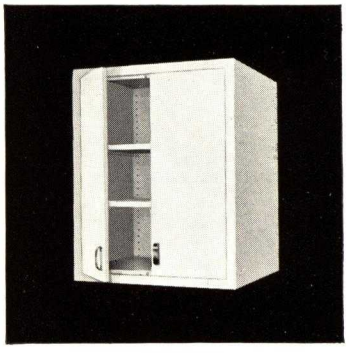


CORNER WALL CABINETS (Left)

To make use of what is usually waste space. Available in two heights—30" and 36". Also available without door and with Chinese Red interior for use as a corner niche for ornaments.

24" HIGH WALL CABINETS (Right)

For use over the 13" deep and 24" deep, 62" high Implement and Linen Cabinets pictured on opposite page, 24" high wall cabinets are available. They are furnished in three widths—15", 18" and 24"; and in two depths—13" and 24".



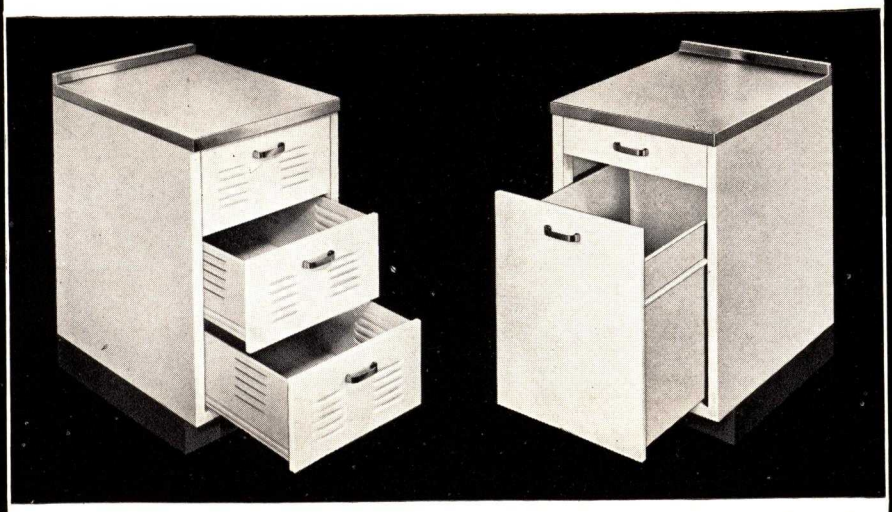
. . CABINET ACCESSORIES . .

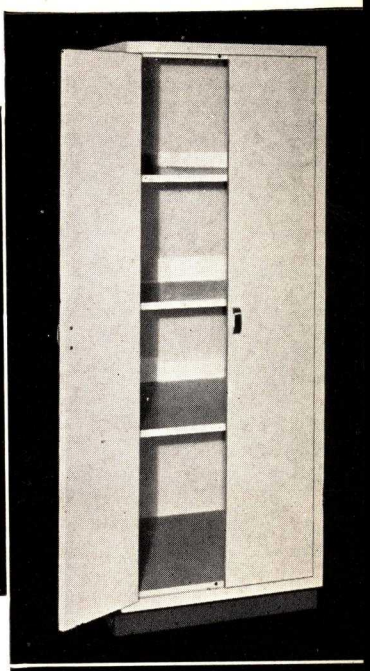
Slicing Board

Cutlery Tray

Lid Rack

. . STEEL UTILITY CABINETS . .





Above: VEGETABLE STORAGE CABINET. 21" and 24" wide with three vegetable bins louvered for air circulation. Used under Monel surface.

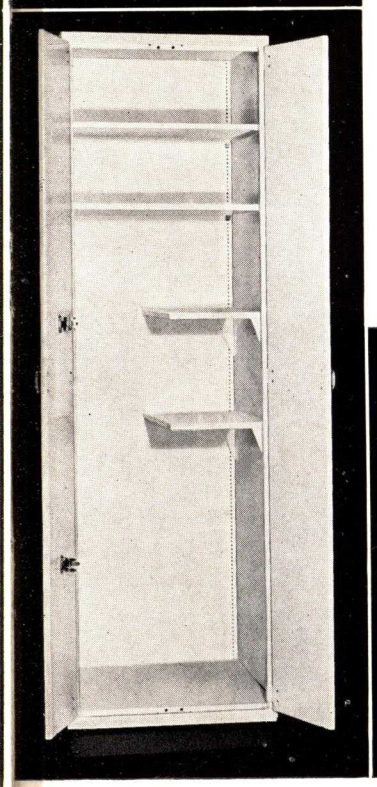
Left Panel: IMPLEMENT CABINETS in two heights. The 62" model (66" high with sub-base) is available in two depths, 13" and 24", and three widths, 15" and 18" single door, and 24", double door. Wall cabinets are available to fill out 90" ceiling. THE 80" IMPLEMENT CABINET (with 4" sub-base) on 84" ceiling for 15" and 24" widths, though only in 24" depth.

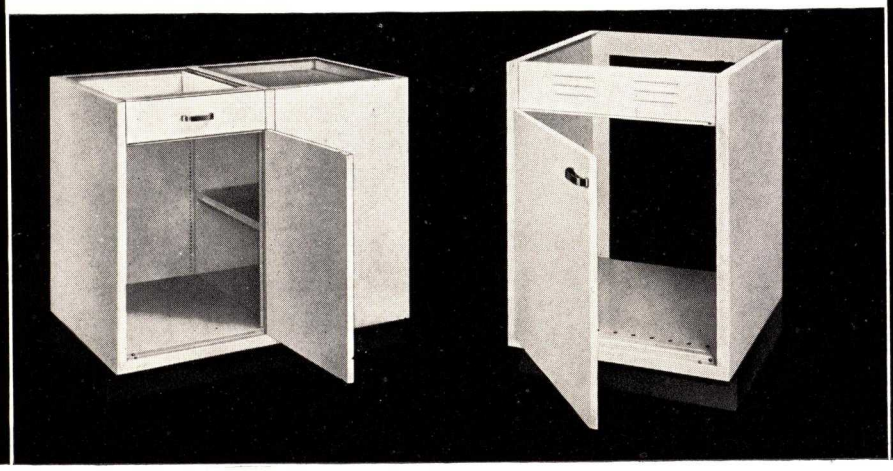
Below: DEAD CORNER CABINET. For storage space in the dead base corner. A three-sided cabinet, 20" deep and 24" wide, fastened to an opened side of BC cabinet, as shown.

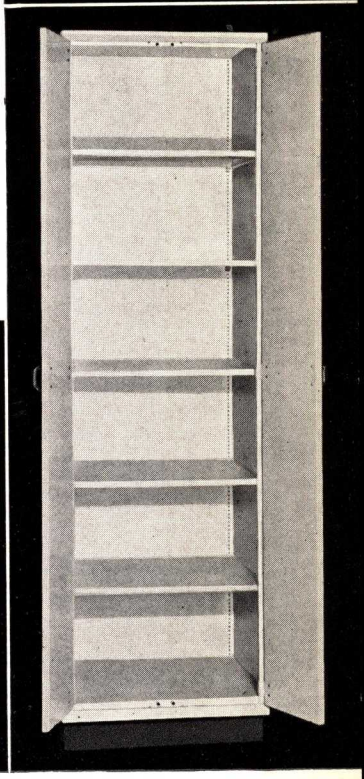
Above: SOILED LINEN CABINET. Available in 21" and 24" widths. Like all base cabinets, 24" deep. Height (with sub-base and Monel top) is 36".

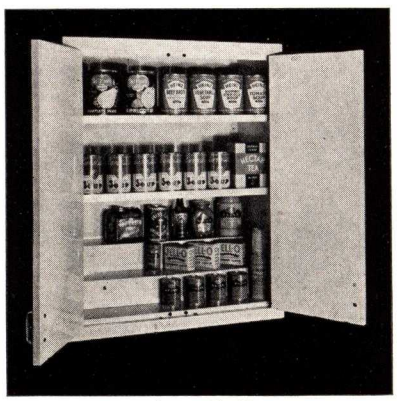
Right Panel: LINEN CABINETS, in two heights. The 62" model (66" high with sub-base) is available in six sizes, 15" and 18" wide with single door and 24" wide with double door —each in 13" and 24" depths. Adjustable shelves. Wall cabinets can be used over all six sizes. THE 80" LINEN CABINET (84" with sub-base) is used when a single cabinet is desired to extend to the ceiling. Available in 24" depth only, and in 15" and 24" widths.

Below: SINK FRONT CABINET. A one-piece unit for use when the bowl is at the end of the sink combination. One size only, 24" wide.

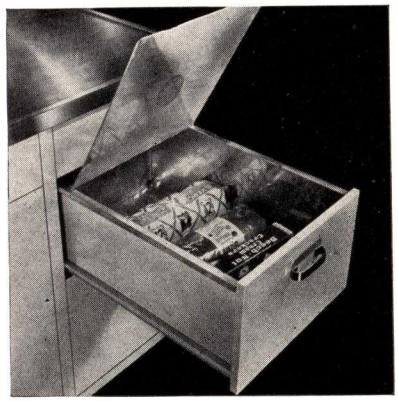




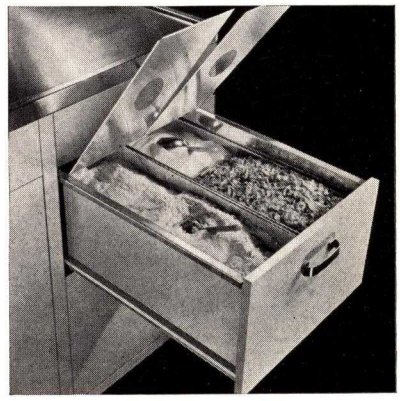




Step Shelf



Bread Bin



Bulk Storage Bin

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19

WHITEHEAD

Work-Saving Kitchens

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CALIFORNIA, Oakland
Whitehead Metal Products Co.
4238 Broadway

CALIFORNIA, San Francisco
Whitehead Metal Products Co.
635 Mission Street

CONNECTICUT, New Haven
J. C. Simmons
63 Fernwood Road

D. C., Washington
Whitehead Metal Products Co.
1018 Eye Street, N. W.

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F. C. Jack
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Clayton G. Herbert
253 Plymouth Bldg.

MISSOURI, St. Louis
W. F. Atkinson
Chemical Bldg.

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Austin F. Loucks, Jr.
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Whitehead Metal Products Co.
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One Niagara Square

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1301 Market Street

TEXAS, Dallas
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208 Construction Building

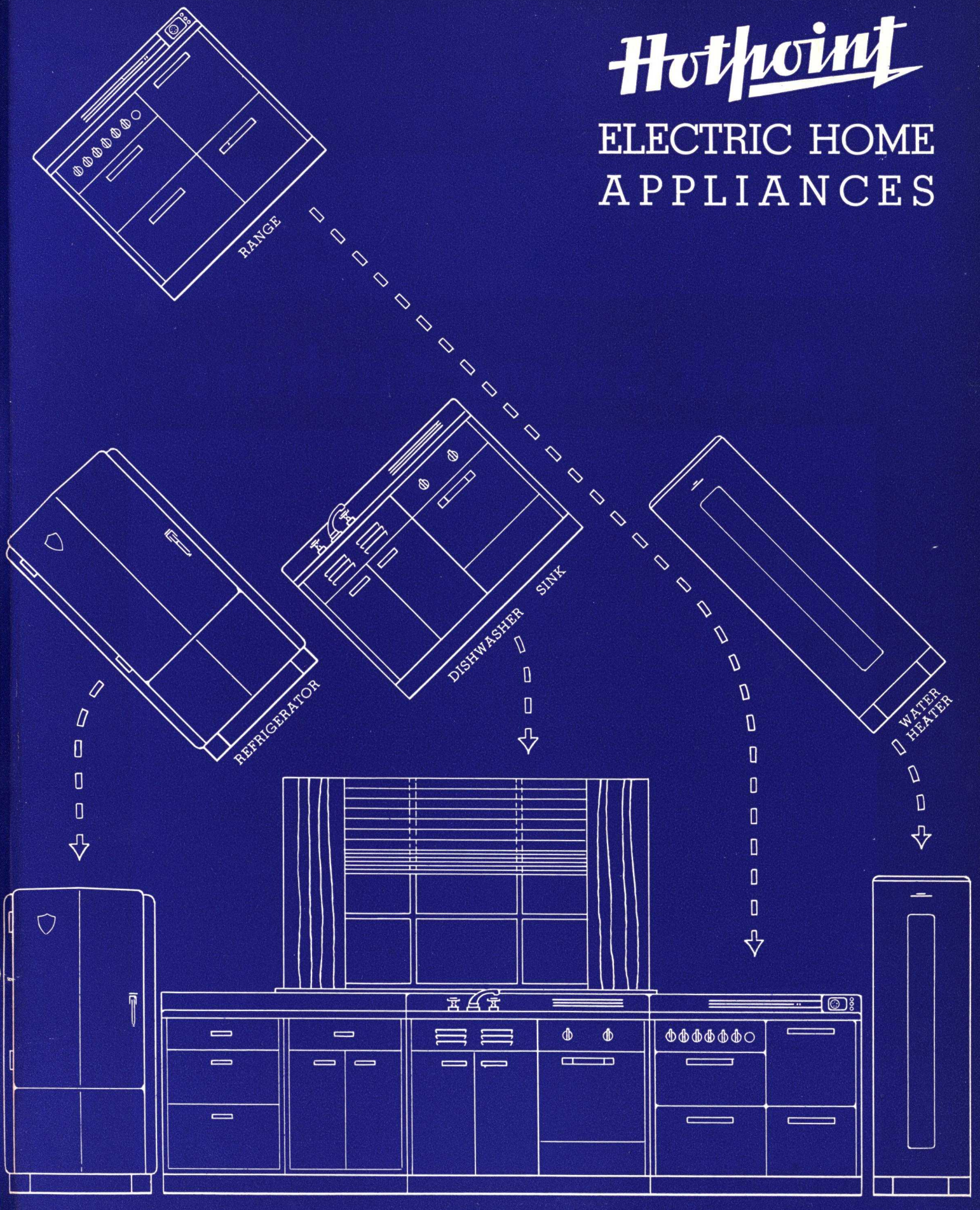
TEXAS, El Paso
George W. Herlin
401 N. Santa Fe Avenue

TEXAS, Houston
C. H. Dinkelacker
1661 Kipling Street

WHITEHEAD METAL PRODUCTS CO., OF NEW YORK, INC.

Hotpoint

ELECTRIC HOME APPLIANCES



EDISON · GENERAL · ELECTRIC · APPLIANCE · COMPANY · INC.

CHICAGO, ILLINOIS

EDISON GENERAL ELECTRIC APPLIANCE COMPANY, INC.

5600 WEST TAYLOR STREET — CHICAGO, ILLINOIS

WHY *Electric* KITCHEN EQUIPMENT?

• **IT'S ECONOMICAL**—1938's electric kitchen appliances are as different from those of 1930 as a modern airliner is from the Wright Brothers' original machine. Exhaustive laboratory research has refined each element to a point where nothing goes to waste. Cost of operation makes Electric Ranges the logical, economical choice for installations of every description.

Specification of major electrical appliances and of all-electric kitchens does two things. It secures low electric rates and it adds to value and desirability of property. The utter *safety* of the electric method is uncontested.

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Specific Data..... 7
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DISHWASHERS 9
COMMERCIAL EQUIPMENT 10, 11
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• **IT'S EFFICIENT**—Recent developments and improvements have made electric heating and power units efficient in the extreme. The heat or power is concentrated to do its full duty—**but no more.** There is no costly wastage.

• **IT'S CLEAN**—No flame, no soot, no dust or grime connected with electrical appliances. Smooth enamel surfaces need only a damp cloth to keep them shining.

• **IT'S FAST**—The new appliances perform their heating jobs with a speed *equal* to or in *excess* of other methods.

WHY *Hotpoint* KITCHEN APPLIANCES?

• **THEY'RE LABORATORY PRODUCTS**—Hotpoint is the world's oldest and largest manufacturer of electric ranges. Years of scientific laboratory tests stand back of every Hotpoint product, resulting in the ultimate in electrical equipment.

• **THEY'RE EFFICIENT**—Hotpoint appliances have won universal recognition for the efficiency of their heating and power units. The Calrod heating unit in our ranges and water heaters is fast, economical, and extremely durable. The Thriftmaster sealed unit in our refrigerators is oil-cooled, silent, time-tried.

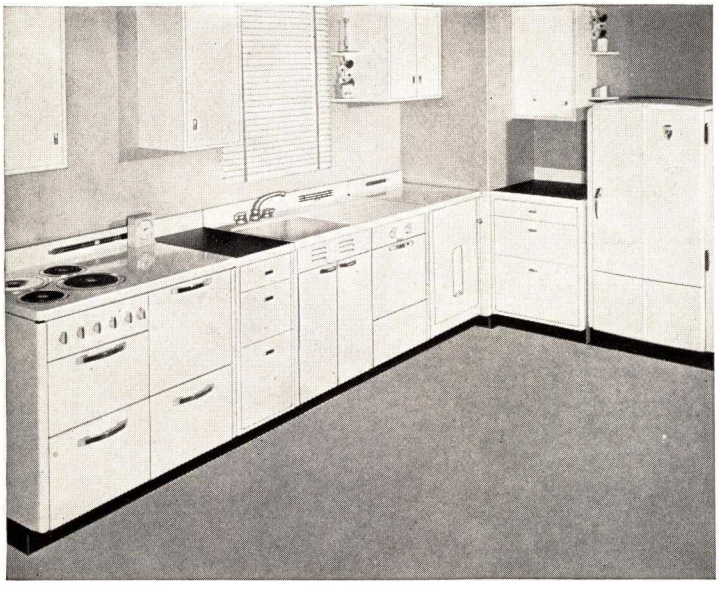
• **THEY'RE GUARANTEED**—All Hotpoint equipment is guaranteed against mechanical and electrical defects for one year, provided it is properly installed. Refrigerators have an added four years' warranty providing replacement or repair for any defect from any cause whatsoever.

• **THEY'RE SAFE**—Hotpoint electrical appliances are fire and explosion proof. They're approved by the Underwriters' Laboratories. No flames—no fumes.

• **THEY'RE STANDARDIZED**—Hotpoint's line of household appliances, standardized both as to design and sizes, allows ensemble planning. An all-Hotpoint kitchen is an harmonious and perfectly styled unit.

NOTE: *Standardization reduces installation costs.*

A COMPLETE LINE—Besides a choice of sizes in all domestic electrical appliances, Hotpoint offers heavy duty products for commercial installations of every description (see pages 10-11).



Cooperation With Architects

KITCHEN PLANNING SERVICE—(See special note on Commercial Equipment, page 10). Edison General Electric Appliance Company maintains an experienced kitchen planning staff of expert technicians ready at all times to advise architects (without obligation). Whether the problem is to determine basic requirements for the smallest apartment kitchen unit or design and lay out a kitchen installation for a metropolitan hotel or ocean liner, Edison's engineers and planners are equipped to find the most efficient solution.

NOTE: *We base our recommendations on actual requirements. We do not overload a layout for the purpose of making a sale.*

NATIONWIDE SERVICE—Hotpoint equipment is serviced by nationwide facilities, with a liberal service policy. We invite your correspondence.

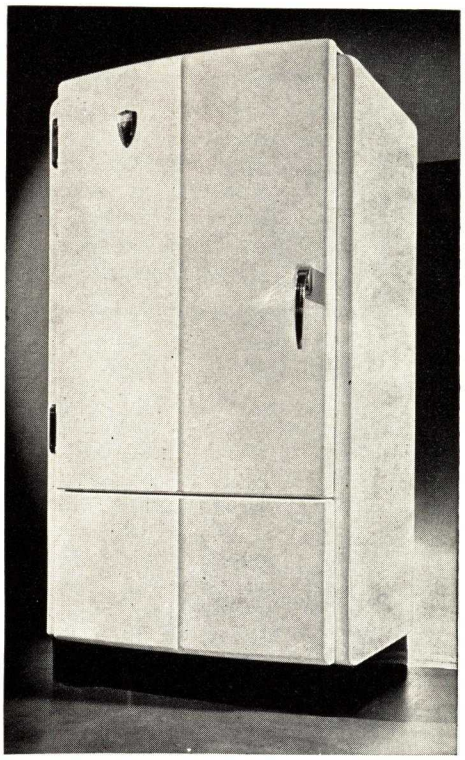
ELECTRIC REFRIGERATORS

The product of scientific laboratory development, Hotpoint refrigerators are dependable, long-life electrical appliances. Economical in operation, distinctively modern in design, they include a number of engineering and equipment features not found in other high-grade electric refrigerators (see below). Designed by engineers who have devoted years to this one subject, they are second to none in the field of modern electrical refrigeration.

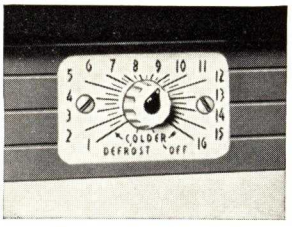
CHOICE OF SIZES—Hotpoint offers a complete line, in capacities ranging from 3 cu. ft. to 16.1 cu. ft.—a size to accommodate the smallest apartment or largest residence.

THRIFTMASTER—Time-tried and tested, the vacuum-sealed Thriftmaster power unit has proved itself one of the most efficient refrigerating units ever produced. Entire mechanism sealed in steel, free from effects of air or moisture. Moving parts finished and gauged to work smoothly and accurately—214 routine tests insure mechanical perfection. Silent in operation, the Thriftmaster is served by sealed forced-feed lubrication, insuring permanent oiling to all bearing surfaces. No belts, no pulleys to ever require servicing.

SPEED FREEZER—This stainless steel unit freezes ice cubes in less than one hour. Keeps food fresh and safe in frosty air held at constant chill by Hotpoint's precisely balanced temperature control.



Ample Toe Space



Temperature Control

Typical Features

ALL STEEL CABINET—No wood to warp, rot, or cause odors.

MODERN FINISH—Exterior finish is durable, high-lustre white, Glyptal baked enamel. This finish is chip-proof and rust-proof. Models also available completely finished in vitreous enamel.

TEMPERATURE CONTROL—Wide range of temperature, plus defrost control—extremely simple.

TOE SPACE—No scuffed shoes.

MODERN HARDWARE—Designed to harmonize with other Hotpoint appliances. Finger-touch door latch.

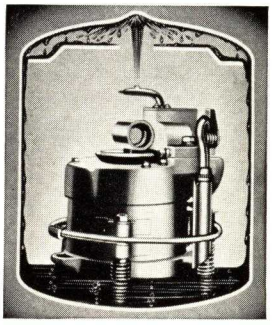
AUTOMATIC INTERIOR LIGHT—Controlled by opening the door.

POP-ICE TRAYS—**Convenience.** Two ice cubes or trayful—no waste—quick and easy.

AUTOMATIC MOTOR GUARD—Protection against voltage surges.

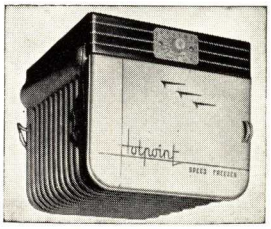
UNLOADER VALVE—Keeps motor free of load during starting and stopping.

See Pages 4-5 for Specific Data

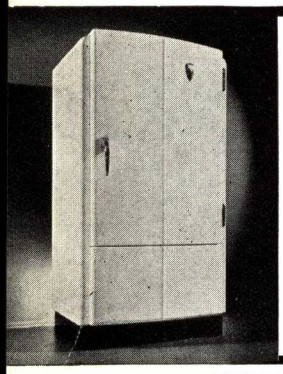


Thriftmaster

Interior Light

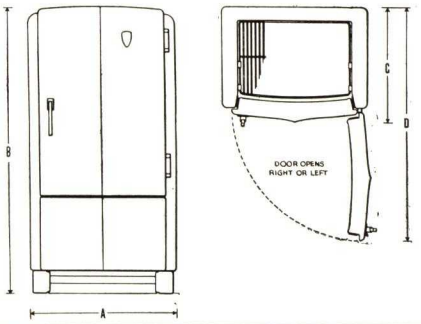


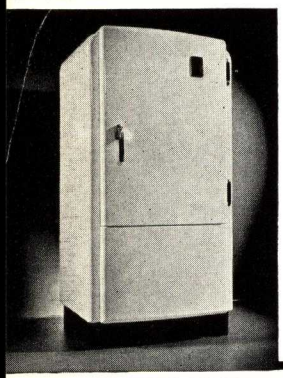
Speed Freezer



DELUXE MODELS

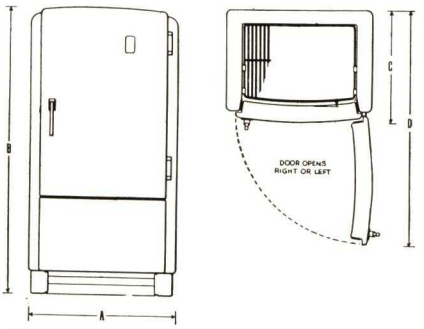
The DeLuxe line incorporates all of the latest convenience features in an all-steel cabinet. Powered by a vacuum-sealed mechanism, cooled by a stainless steel freezing chamber. Porcelain interior. Baked Glyptal enamel over Bonderized steel provides durable exterior finish. In appearance, performance and length of life, they leave nothing to be desired. Quiet, and beautifully designed, they will fit nicely into any style of kitchen.

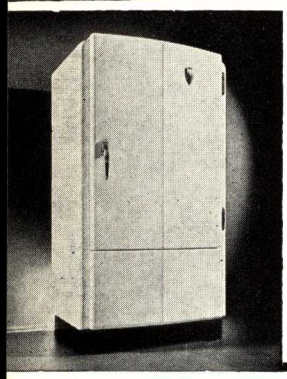




STANDARD MODELS

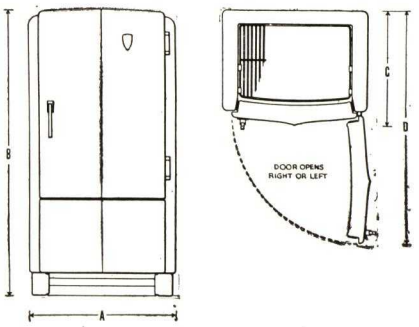
Hotpoint's "Standard" line includes refrigerators of five, six, and seven cu. ft. capacity. It is the low-priced line. While not including the many convenience features found in the higher-priced lines, these models are powered by the same vacuum-sealed mechanism used in Hotpoint's most expensive models. The cabinets are all-steel, the interiors are porcelain, the freezing chambers stainless steel. Ideal for low-cost housing. Fool-proof, tamper-proof, rugged but stylish construction.

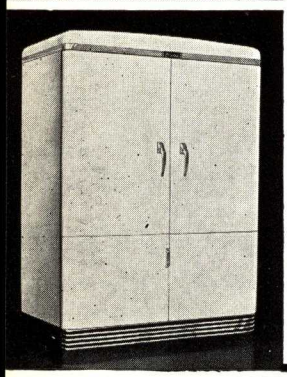




IMPERIAL MODELS

Hotpoint's Imperial line is composed of four single-door models—of four, five, six and eight cu. ft. capacity. They are finished in porcelain inside and out, from top to bottom. Every desirable convenience feature has been provided. From both an appearance and operating standpoint, they will satisfy the most discriminating.

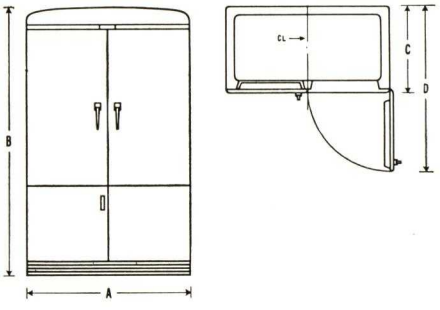


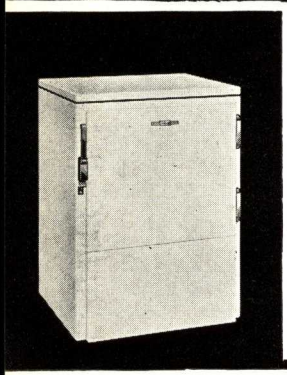


IMPERIAL MODELS (Large Capacity)

Hotpoint's two large Imperial models at 12 and 16 ft. capacity ideally provide for the occasional demand for a very spacious refrigerator of unusual appearance and appointment.

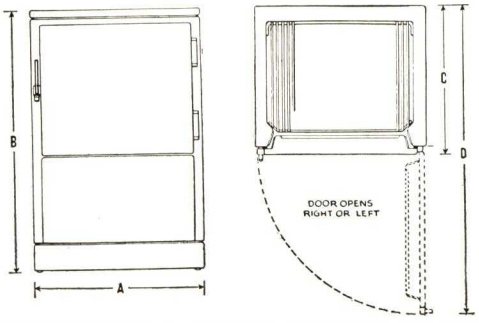
They are equipped with every convenience feature. Finished in porcelain inside and out, with chromium trim. Large storage drawer provides additional storage space for pots and pans or foods not requiring refrigeration.





APARTMENT MODEL

For apartment kitchens of limited dimensions, the Hotpoint Kitchenette is ideal. It is exactly work-surface high—36 inches. It can be built in, because provision has been made for ventilation. Here is a three cu. ft. box of substantial construction. Its all-steel cabinet, stainless steel freezing chamber, and vacuum-sealed mechanism endow it with the stamina it needs for an apartment house job.



DATA AND DIMENSIONS

DELUXE MODELS

Model	Exterior—Overall Dimensions, Inches				Capacity, Cu. Ft.	Shelf Area, Sq. Ft.	Net Weight Lbs.	Shipping Weight Lbs.	Thriftmaster Compressor (Horsepower)		Accessories
	A	B	C*	D					60-50 Cycle	D.C.	
Bungalow 120EC42	24	49 9/16	24 7/8	42 1/2	4.0	9.3	210	266	1/8	1/6	Two 2½-lb. Aluminum Ice Trays, 3 Stationary Shelves, 1 Part Shelf, 1 Medium Porcelain Vegetable Pan; Automatic Light, 1937 Type Ice Tray Release, 1937 Type Thermometer.
Colonial 120EC52	27 3/4	53 9/16	26 5/8	46 15/16	5.0	10.6	272	325	1/8	1/6	One 2-lb. Aluminum Ice Tray; two 2-lb. "Pop-Ice" Trays; 1 Stationary Shelf; 2 Sliding Shelves; 1 Part Shelf; 1 Bottle Rack; 2 Adjustable Height Shelves; 1 Split (bottom) Shelf; All Grouped Wire Shelf; 1 Sliding Vegetable Pan, Size "A"; 1 Glass Water Bottle; Automatic Light; 1938 Tray Release; 1938 Thermometer.
Norman 120EC62	30	56 1/2	26 3/8	48 13/16	6.1	12.2	310	383	1/8	1/6	Four 2-lb. "Pop-Ice" Trays; 1 Stationary Shelf; 2 Sliding Shelves; 1 Part Shelf; 1 Bottle Rack; 2 Adjustable Height Shelves; 1 Split (bottom) Shelf; All Grouped Wire Shelves; 1 Sliding Vegetable Pan, Size "B"; 1 Sliding Basket; 1 Glass Water Bottle; Automatic Light; 1938 Type Tray Release; 1938 Thermometer.
Doric 120EC72	30	60	26 7/8	49 5/16	7.1	15.1	345	448	1/8	1/6	Six 2-lb. "Pop-Ice" Trays; 1 Removable Evaporator Shelf; 1 Stationary Shelf; 3 Sliding Shelves; 1 Part Shelf; 1 Bottle Rack; 3 Adjustable Height Shelves; 1 Split (bottom) Shelf; All Grouped Wire Shelf; 1 Sliding Vegetable Pan, Size "B"; 1 Sliding Basket; 1 Glass Water Bottle; Automatic Light; 1938 Tray Release; 1938 Thermometer.
Tudor 120EC82	33	60	28	53 3/8	8.1	16.9	364	470	1/8	1/6	Six 2-lb. "Pop-Ice" Trays; 1 Removable Evaporator Shelf; 1 Stationary Shelf; 3 Sliding Shelves; 1 Part Shelf; 1 Bottle Rack; 3 Adjustable Height Shelves; 1 Split (bottom) Shelf; All Grouped Wire Shelf; 1 Sliding Vegetable Pan, Size "C"; 1 Sliding Basket; 1 Glass Water Bottle; Automatic Light; 1938 Type Tray Release; 1938 Thermometer.

STANDARD MODELS

Colonial 120EB52	27 3/4	53 9/16	26 5/8	46 15/16	5.0	10.6	245	320	1/8	1/6	Two 2-lb. Aluminum Ice Trays; one 2-lb. "Pop-Ice" Tray; 3 Stationary Shelves; 1 Part Shelf; 1 Large Vegetable Pan; Automatic Light; 1938 Tray Release; 1937 Type Thermometer.
Norman 120EB62	30	56 1/2	26 3/8	48 13/16	6.1	12.2	300	380	1/8	1/6	Two 2-lb. Aluminum Ice Trays; two 2-lb. "Pop-Ice" Trays; 3 Stationary Shelves; 1 Part Shelf; 1 Large Porcelain Vegetable Pan; Automatic Light; 1938 Type Tray Release; 1937 Type Thermometer.
Doric 120EB72	30	60	26 7/8	49 5/16	7.1	15.1	347	435	1/8	1/6	Two 2-lb. Aluminum Ice Trays; two 2-lb. "Pop-Ice" Trays; 4 Stationary Shelves; 1 Part Shelf; 1 Large Porcelain Vegetable Pan; Automatic Light; 1938 Type Tray Release; 1937 Type Thermometer.

IMPERIAL MODELS

Bungalow 110ED42	24	49 9/16	24 7/8	42 1/2	4.0	9.3	210	255	1/8	1/6	Two 2½-lb. Aluminum Ice Trays; 3 Stationary Shelves; 1 Part Shelf; 1 Medium Porcelain Vegetable Pan; Automatic Light; 1937 Type Ice Tray Release; 1937 Type Thermometer.
Colonial 110ED52	27 3/4	53 9/16	26 5/8	46 15/16	5.0	10.6	275	330	1/8	1/6	One 2-lb. Aluminum Ice Tray; two 2-lb. "Pop-Ice" Trays; 1 Stationary Shelf; 2 Sliding Shelves; 1 Part Shelf; 1 Bottle Rack; 2 Adjustable Height Shelves; 1 Split (bottom) Shelf; All Grouped Wire Shelf; 1 Sliding Vegetable Pan, Size "A"; 1 Crockery Water Bottle; 1 Set of Dishes (Set of six); Automatic Light; 1938 Type Tray Release; 1938 Type Thermometer.
Norman 110ED62	30	56 1/2	26 3/8	48 13/16	6.1	12.2	315	390	1/8	1/6	Four 2-lb. "Pop-Ice" Trays; 1 Stationary Shelf; 2 Sliding Shelves; 1 Part Shelf; 1 Bottle Rack; 2 Adjustable Height Shelves; 1 Split (bottom) Shelf; All Grouped Wire Shelf; 1 Sliding Vegetable Pan, Size "B"; 1 Sliding Basket; 1 Crockery Water Bottle; 1 Set of Dishes (Set of six); Automatic Light; 1938 Type Tray Release; 1938 Type Thermometer.
Tudor 110ED82	33	60	28	53 3/8	8.1	16.9	390	490	1/8	1/6	Six 2-lb. "Pop-Ice" Trays; 1 Removable Evaporator Shelf; 1 Stationary Shelf; 3 Sliding Shelves; 1 Part Shelf; 1 Bottle Rack; 3 Adjustable Height Shelves; 1 Split (bottom) Shelf; All Grouped Wire Shelf; 1 Sliding Vegetable Pan, Size "C"; 1 Sliding Basket; 1 Crockery Water Bottle; 1 Set of Dishes (Set of six); Automatic Light; 1938 Type Tray Release; 1938 Type Thermometer.

IMPERIAL MODELS (Large Capacity)

Super Imperial Empire 110ED122	40	67 5/32	31 17/32	46 3/4	12.0	26.3	660	762	1/6	1/3	Six 2-lb. "Pop-Ice" Trays; 1 Large Dessert Pan; 2 Stationary Shelves; 6 Sliding Shelves; All Grouped Wire Shelf; 2 Sliding Vegetable Pans, Size "D"; 1 Storage Bin (Non-Refrigerated); 1 Crockery Water Bottle; 1 Set of Dishes (Set of six); Automatic Light; 1938 Type Tray Release; 1938 Type Thermometer.
Super Imperial American 110ED162	49	67 5/32	31 17/32	51 1/4	16.1	32.3	760	862	1/6	1/3	Six 2-lb. "Pop-Ice" Trays; 1 Large Dessert Pan; 2 Stationary Shelves; 6 Sliding Shelves; All Grouped Wire Shelf; 2 Sliding Vegetable Pans, Size "D"; 1 Storage Bin (Non-Refrigerated); 1 Crockery Water Bottle; 1 Set of Dishes (Set of six); Automatic Light; 1938 Type Tray Release; 1938 Type Thermometer.

APARTMENT MODEL

Kitchenette 120EB32	23 3/4	36	22 3/4	45	2.8	6.9	205	250	1/8	1/6	Two 2½-lb. Aluminum Ice Trays; 2 Stationary Shelves; 1937 Type Ice Tray Release.

Includes Hardware and Space for Ventilation.

ELECTRIC RANGES

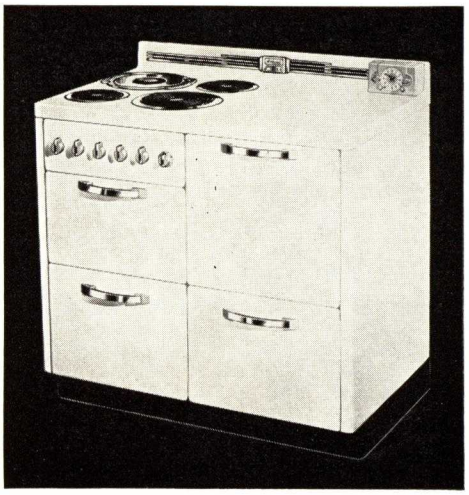
The cleanliness, speed and reliability of electric cookery finds its ultimate expression in Hotpoint's extensive line of stylish, modern ranges. Completely free from soot and dirt, cool to use, fast in operation, the Hotpoint line is standardized in design to harmonize with all other Hotpoint kitchen units. In sizes to accommodate the bachelor apartment or the largest residence, the entire series is equipped with Hotpoint's time-tested features, and all newest but proven conveniences.

• **CALROD UNIT**—Independent tests conducted by engineers of the famous Electrical Testing Laboratories prove that Calrod (see photo, top left) has an average life **in excess** of 4,565 hours on High heat, equal to 15 years of severe domestic service—**6 times the life of the next best electric cooking unit.** Calrod's amazing durability is matched only by its superior speed, for other tests by Hotpoint engineers show that Calrod is 11% to 21% faster than any other unit. Such performance establishes Calrod as an outstanding electric unit which makes electric cookery both fast and economical.

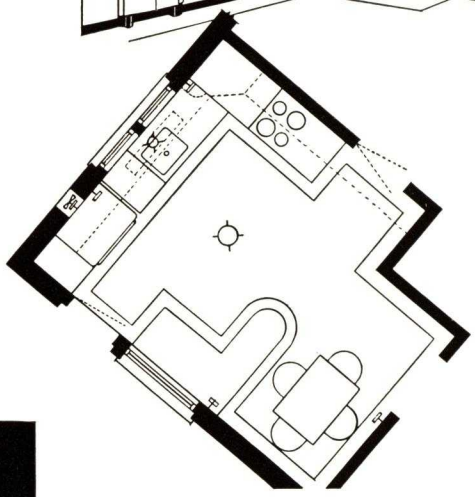
See cross-section at bottom of page for cut-away view of Calrod's sturdy internal construction.

• **BATTLESHIP FRAME** — All Hotpoint electrical ranges are constructed of steel, welded into one rigid unit. Eliminates useless nuts, bolts and screws.

• **MODERN STYLING**—Designed to harmonize with all other Hotpoint kitchen equipment, the ranges have balanced proportions, modern lines, rounded corners, and a white, acid-resisting, easy-to-clean porcelain enamel finish.



The Sherwood



Typical Features

THRIFT COOKER — In all except apartment house models: 6-qt. aluminum cooking vessel with cover, in separate compartment in range cooking top. Economical for slow cooking at low temperature. Bakes, stews, steams, boils, braises, roasts or cooks complete meals in one operation. Wire basket converts it for deep-fat frying over a surface Calrod unit.

SAFETY PLUG—Connections for Hi-Speed Calrod surface units eliminate danger of electrical shock from units. All live contacts completely shielded.

INSULATION—Thick blanket of Rock Wool keeps all the heat in the oven.

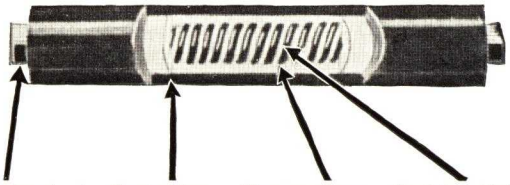
OVERSIZE OVEN—Large enough for a complete meal—two big turkeys or nine, one quart canning jars. Porcelain enameled interior.

THERMOSTAT—Accurate, automatic oven temperature control results in perfect baking and roasting.

At Left:
THE HIGHLANDER

KITCHEN PLANNING

In working out household kitchen layouts, we invite architects to ask us questions. Our technicians and designers have analyzed literally thousands of kitchens to determine the most efficient solution to any kitchen problem. By such cooperation you will be assured of a kitchen that serves its function properly. Money and space will be saved, and attractiveness as well as utility will be considered.



At Right:
Cross Section of the Practically Indestructible Calrod Heating Element

Terminal of heavy non-corrosive material threaded into resistance wire.

Protective metal casing. Nickel-chromium alloy.

Magnesium oxide electrical insulator and heat conductor.

Resistor, Calorite finest grade nickel chromium wire made to Hotpoint specifications.

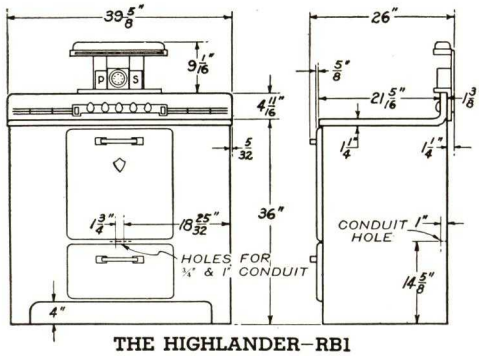
DIMENSIONS AND SPECIFIC DATA

RB1—3 Calrod surface units—one, 8½ in.; two, 6½ in.; Thrift cooker; Open coil oven unit; Lamp with bracket and shelf with condiment jars; Large storage drawer; Convenient split top unit arrangement.

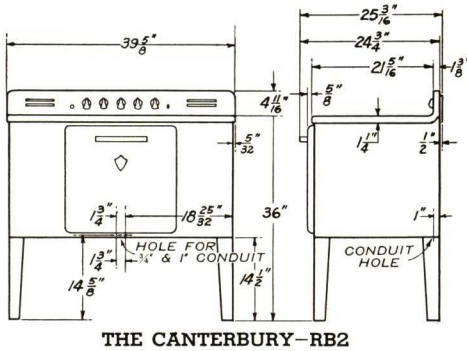
RB2—3 Calrod surface units—one, 8½ in.; two, 6½ in.; Thrift cooker; Open coil oven unit.

RD2—3 Calrod surface units—one, 8½ in.; two, 6½ in.; Thrift cooker; Lower oven unit; Broiler unit; Calrod warming compartment; 2 large utility drawers.

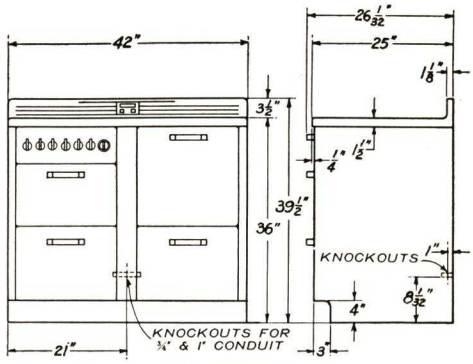
RC4—3 Calrod surface units—one, 8½ in.; two, 6½ in.; Thrift cooker; 2 open coil oven units; 2 storage drawers; Lamp; Timer clock; Warmer compartment.



THE HIGHLANDER—RB1



THE CANTERBURY—RB2



THE EMBASSY—RD2

RD3—5 Calrod surface units—two, 8½ in.; three, 6½ in.; Thrift cooker; Lower oven unit and broiler unit in both ovens; Calrod warming compartment; 3 utility drawers.

RC1—3 Calrod surface units—one, 8½ in.; two, 6½ in.; Thrift cooker; 2 open coil oven units; 3 utility drawers.

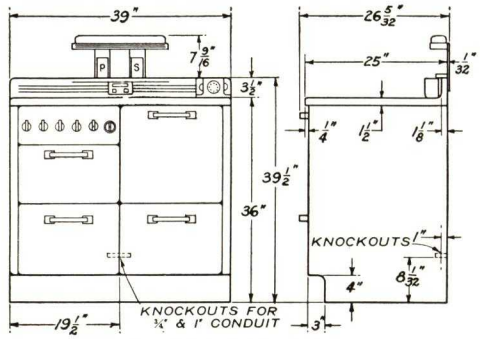
RC2—3 Calrod surface units—one, 8½ in.; two, 6½ in.; Thrift cooker; 2 open coil oven units; 1 storage drawer.

RD1—3 Calrod surface units—one, 8½ in.; two, 6½ in.; Thrift cooker; Lower oven unit and broiler unit in both ovens; 1 utility drawer.

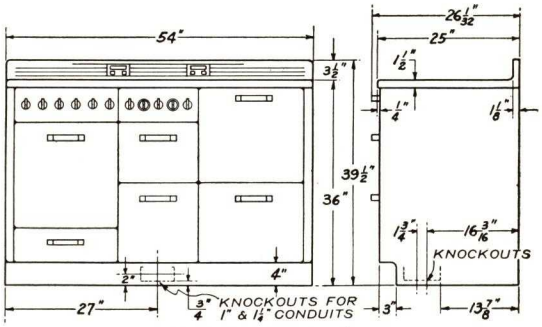
RC3—3 Calrod surface units—one, 8½ in.; two, 6½ in.; Thrift cooker; Lower oven unit; Broiler unit.

RB4—3 Calrod surface units—one 8½ in.; two, 6½ in.; Open coil oven unit.

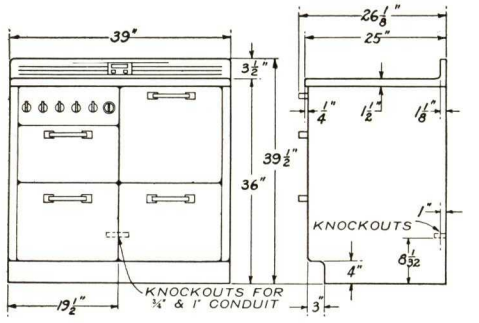
RA170—Complete description of the Husky on Page 10.



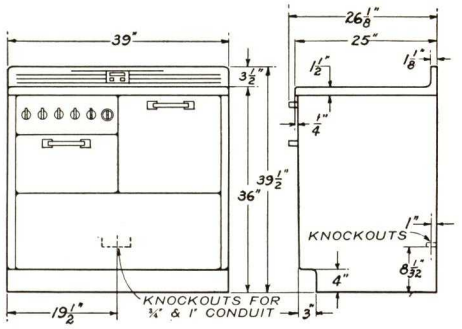
THE SALISBURY—RC4



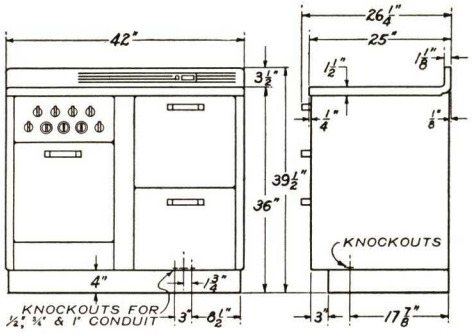
THE EMPIRE—RD3



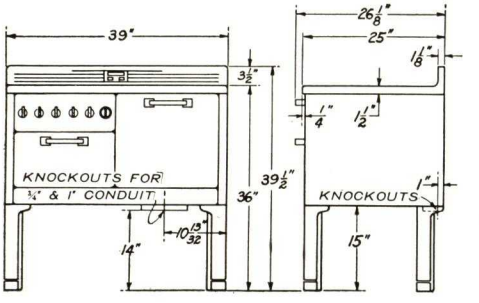
THE SHERWOOD—RC1



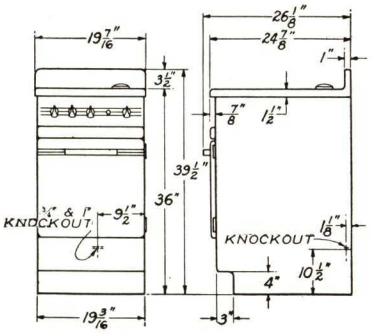
THE LANCASTER—RC2



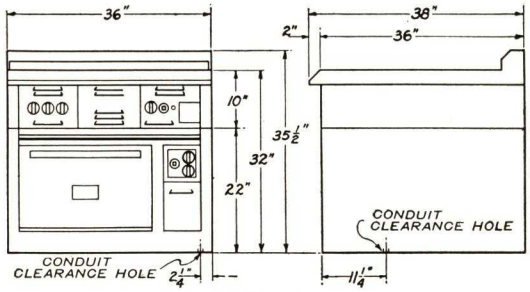
THE MANOR—RD1



THE DEVONSHIRE—RC3

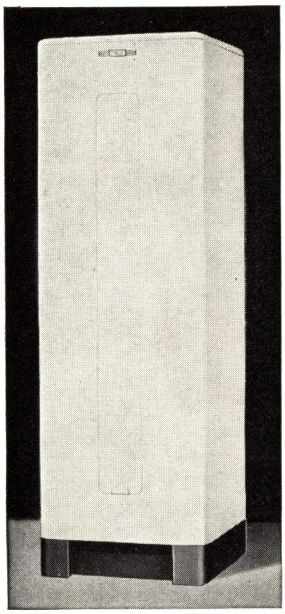


THE YORKSHIRE—RB4

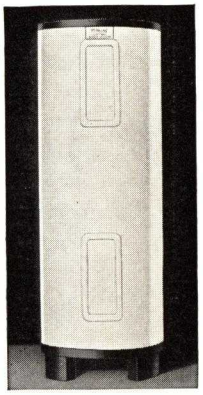


THE HUSKY—RA170

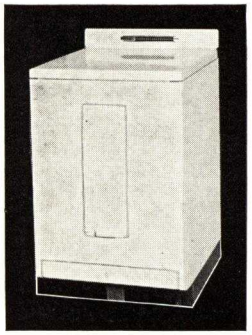
ELECTRIC WATER HEATERS



VOGUE MODEL



MASTER MODEL



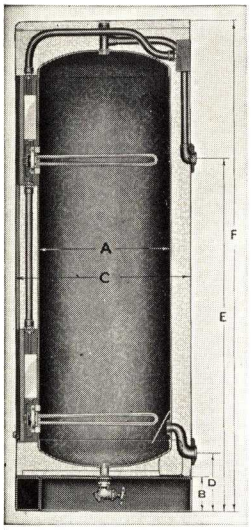
VOGUE TABLE TOP

Heating water by electricity is not expensive. Recent refinements, plus low power rates now available, make it economical, convenient, safe and clean.

Typical of all Hotpoint appliances, Hotpoint electric water heaters are rugged, dependable, and attractive. Ranging from 1 gal. (accessory heaters in professional offices, tourist cabins, etc.) up to 140 gals., most models are available with either galvanized copper bearing steel tanks, or monel metal tanks.

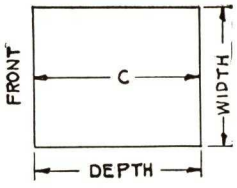
The heating unit is the renowned long-life Calrod immersed from the side of the tank into the water. A completely automatic temperature control switch—The Hotpoint Thermo-snap—guarantees uniform hot water temperature. It is adjustable from 130 degrees F. to 200 degrees. A thick blanket of rock wool insulation keeps all the heat within the tank. Both round and rectangular models are standard. The Vogue Table Top is specially designed to fit in with the other Hotpoint appliances to form the streamlined, Hotpoint, all-electric kitchen.

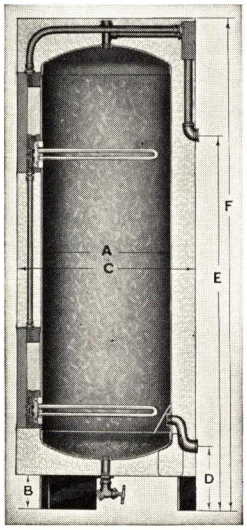
NOTE: In this catalog we do not attempt to state the delivery capacity of each heater because of the variables involved. Consult Hotpoint engineers when hot water problems arise. You should have Hotpoint's Water Heater Sales Manual in your file. It will be sent you from the Chicago office for a small charge.



Vogue (Rectangular)

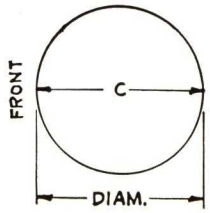
Capacities: 10 to 140 gals. Vogue models, with their modern rectangular styling are ideal for modern all-electric kitchens, basements or bath rooms. In most cases, galvanized copper bearing steel tanks are recommended, but monel metal tanks should be used where corrosive water exists.





Master (Round)

Capacities: 1 gal. to 86 gals. The Master heaters, with round outer casings, embody the same features and refinements of internal construction as the rectangular Vogue model. Small capacity heaters are unexcelled for use in professional offices, business offices, filling stations.



DIMENSIONS—ALL TANKS 300-POUND TEST PRESSURE

	Catalog Number	Cap. Gal.	Tank Diam. (A)	Base Hght. (B)	Overall Dimen. Width	Overall Dimen. Depth (C)	Floor to Cold Water Inlet (D)	Floor to Hot Water Outlet (E)	Over-all Height (F)	Av. Insul. Thick.
GALVANIZED COPPER BEARING STEEL TANKS	**VOGUE MODELS (RECTANGULAR)—Back Connected**									
	W113	30	14″	4″	17½″	19½″	7 7/8″	42 7/16″	57″	3 3/16″
	W114	40	16″	4″	19½″	21½″	7 15/16″	43 1/4″	58″	3 5/16″
	W115	52	18″	4″	21½″	23½″	8 1/4″	43 11/16″	58″	3 7/16″
	W116	66	20″	4″	23½″	25½″	8″	45 7/16″	60″	3 9/16″
	W118	86	22″	4″	25½″	27½″	8″	48 7/16″	63″	3 11/16″
	W120	110	24″	4″	27½″	29½″	9 1/16″	53 5/16″	68″	3 13/16″
	W121	140	26″	4″	29½″	31½″	8 7/8″	58 5/8″	73″	3 15/16″
	MASTER MODELS—All Back Connected									
	W96	30	14″	4″	20½″	20½″	7 15/16″	41 15/16″	57″	3″
	W97	40	16″	4″	22½″	22½″	7 15/16″	42 3/4″	58″	3″
	W98	52	18″	4″	24½″	24½″	8 1/4″	43 1/8″	58″	3″
	W101	66	20″	4″	26½″	26½″	7 7/8″	44 7/8″	60″	3″
	W102	86	22″	4″	28½″	28½″	7 7/8″	47 7/8″	63″	3″
	MASTER MODELS (ROUND)—Small Capacity Heaters									
	W48	1	4½″		8 3/8″	8 3/8″	2 9/16″	16 5/16″	20 3/4″	1 3/4″
	W78	3	7″		12 1/8″	12 1/8″	3 7/8″	20 1/8″	24 1/8″	2 1/2″
	W67	5	8″		12 1/8″	12 1/8″	1 5/8″	25 3/8″	29 1/8″	2″
	VOGUE MODELS—Small Capacity Heaters									
	W94	10	10″	3″	13 1/8″	14 1/8″	43 3/8″	43 3/8″	43 3/8″	2 11/16″
	W95	18	10″	3″	13 1/8″	14 1/8″	64 3/8″	64 3/8″	64 3/8″	2 11/16″
	VOGUE MODELS—Bottom Connected									
	W143	30	14″	9″	17½″	19½″	8 3/4″	8 3/4″	63″	3 3/16″
	W144	40	16″	9″	19½″	21½″	8 3/4″	8 3/4″	63″	3 5/16″
	W145	52	18″	9″	21½″	23½″	8 3/4″	8 3/4″	63″	3 7/16″
	VOGUE TABLE TOP									
	WG330	30	20″	7″	24″	25″	6 1/4″	6 1/4″	39½″	3 9/16″
	VOGUE with Large 4″ Lower Unit Opening									
	W213	30	14″	4″	17½″	19½″	7 7/8″	42 7/16″	57″	3 3/16″
	W215	52	18″	4″	21½″	23½″	8 1/4″	43 11/16″	58″	3 7/16″
	W218	86	22″	4″	25½″	27½″	8″	48 7/16″	63″	3 11/16″
	MASTER MODELS with Large 4″ Lower Unit Opening									
	W196	30	14″	4″	20½″	20½″	7 15/16″	41 15/16″	57″	3″
	W198	52	18″	4″	24½″	24½″	8 1/4″	43 1/8″	58″	3″
MONEL METAL TANKS	**VOGUE MODELS**									
	W123	30	12″	4″	15½″	17½″	6 3/4″	54 11/16″	69″	3 1/16″
	W124	40	14″	4″	17½″	19½″	7 1/4″	54 3/8″	69″	3 3/16″
	W125	50	16″	4″	19½″	21½″	7 1/8″	54 3/8″	69″	3 5/16″
	W126	66	20″	4″	23½″	25½″	7 1/4″	48 9/16″	63″	3 7/16″
	W128	86	22″	4″	25½″	27½″	7 3/8″	52 1/16″	67″	3 11/16″
	W130	110	24″	4″	27½″	29½″	9 1/16″	53 5/16″	68″	3 13/16″
	W131	140	26″	4″	29½″	31½″	8 7/8″	58 5/8″	73″	3 15/16″
	MASTER MODELS—Small Capacity Heaters									
	W148	1	4½″		8 3/8″	8 3/8″	2 9/16″	16 5/16″	20 3/4″	1 13/16″
	W178	3	7″		12 1/8″	12 1/8″	3 7/8″	20 1/8″	24 1/8″	2 1/2″
	W167	5	8″		12 1/8″	12 1/8″	1 5/8″	25 3/8″	29 1/8″	2″
	VOGUE MODELS—Small Capacity Heaters									
	W194	10	10″	3″	13 1/8″	14 1/8″	43 3/8″	43 3/8″	43 3/8″	2 11/16″
	W195	18	10″	3″	13 1/8″	14 1/8″	64 3/8″	64 3/8″	64 3/8″	2 11/16″

ELECTRIC DISHWASHERS

Completing Hotpoint's line of streamlined kitchen units are the Electric Dishwashers and the Kitchen Waste Unit. With the Hotpoint Dishwasher, apartment operators, as well as home owners, enjoy real savings of hot water.

There are three standard models—The Arlington, a 24 in. independent unit; The M5, a 48 in. unit complete with a white vitreous enameled sink and provision for the Hotpoint Kitchen Waste Unit; and The Waverly, for installation under standard sink-tops and work surfaces of other manufacturers.

• **CAPACITY**—The flexible capacity easily handles the dishes from any family. Thirty dishes plus silverware can be washed at one time. If additional runs are necessary, the dishes may be placed in an extra rack while one rack full is being washed. Five quarts of water are used for each washing operation.

• **FRONT OPENING DOOR**—Dishes are placed in the Hotpoint Dishwasher through a door in the front. This feature insures an undisturbed working surface over the dishwasher. It also simplifies installation of The Waverly under standard work surfaces.

Distinctive Features

LOW OPERATING COST—The average cost of washing dishes in the Hotpoint Dishwasher is less than 3c a day. This includes the cost of hot water, detergent, and power for operating motor.

SIMPLE OPERATION—All the dishes are supported in a single tray in the direct path of the water. Special care in loading the plates in the rack is not necessary in order to wash the cups and glasses.

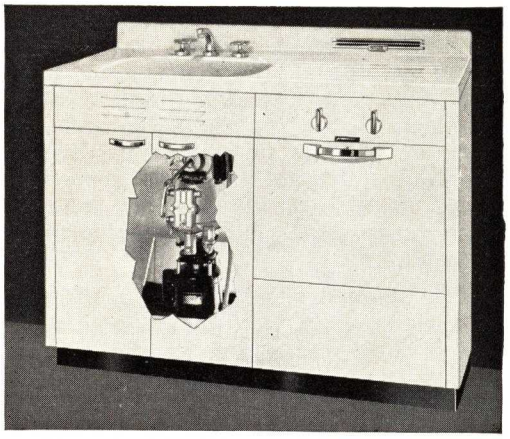
AUTOMATIC WATER MEASUREMENT—Hotpoint Dishwashers are equipped with electrical measuring devices to relieve the operator of the care usually required to measure the water into the dishwasher tub. The water valve is simply latched and is closed automatically.

THE DOOR INTERLOCK—The interlock between the water and motor control and the door lock prevents the operator from opening the door while the dishwasher is in operation.

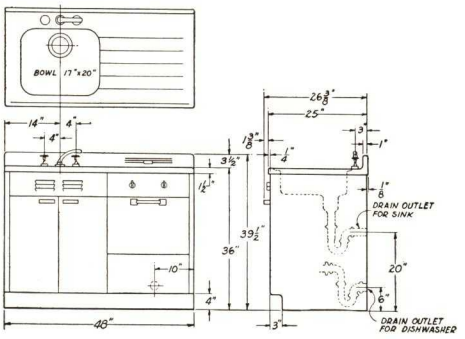
INLET SPRAY—Hotpoint Dishwashers are equipped with the desirable fresh water overhead spray for feeding the water into the machine and flushing away food soil.

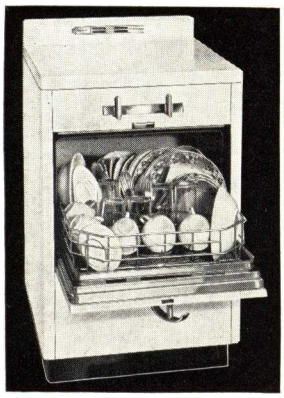
THE MOTOR—All units are equipped with ¼ h.p., 110 volts, 60-cycle, a.c. motors. (Other frequencies are available.) These motors require no oiling during the life of the dishwasher.

FINISH—Work surfaces are white vitreous enamel. The cabinets are baked white Calgloss enamel. All bases are finished in black japan.



Dishwasher Sink Showing Kitchen Waste Unit
Details Below



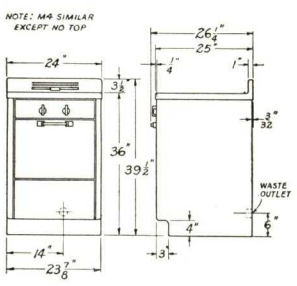


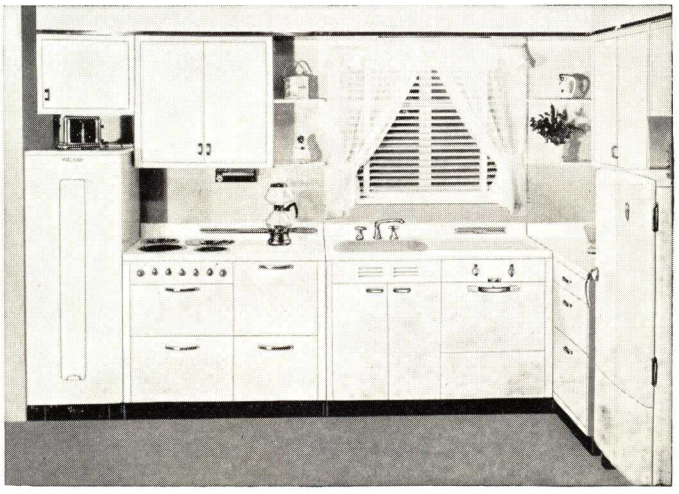
M1, Above; M4 at Right

KITCHEN WASTE UNIT

The Hotpoint Kitchen Waste Unit fits into any sink which can be provided with a 5-in. hole for the strainer, and which has a clearance of from 2 ft. 2 in. to 2 ft. 6¼ in. It is substantially an electrical shredder that efficiently disposes of all organic kitchen waste. Installation details can be secured from Hotpoint's Kitchen Design Division.

● **Kitchen Design Manual**
Architects are invited to send for "Kitchen Design Manual," compiled by Hotpoint's extensive engineering and research staff. It contains thorough analysis of the problem of kitchen planning.





COMMERCIAL COOKING AND BAKING EQUIPMENT

• **A COMPLETE LINE**—Edison Hotpoint manufactures more than 100 separate items in its group of specialized heavy duty electric kitchen appliances. Space considerations limit us to presenting only a few typical products in this catalog.

The complete line includes Baking and Roasting Ovens, Ranges, Broilers, Urns, Steam Tables, Plate Warmers, Stock and Fry Kettles, Griddles, Waffle Bakers, Egg Boilers, Hotplates, Grills and Toasters.

On request we will gladly furnish descriptive data and detailed specifications on any piece of equipment.

• **COMMERCIAL KITCHEN PLANNING SERVICE**—In the highly technical, highly specialized problem of laying out efficient large-scale kitchen installations we modestly claim to be authorities. Our engineers and technicians have had years of training and experience in the design and installation of every type of commercial, institutional and governmental kitchen layout—from small restaurants, to the complexity of great hotel commissaries and the marine galleys of ocean-going liners.

Whenever a specialized kitchen problem arises—restaurants, hotels, hospitals, community buildings, college dining halls, factories, church buildings, public institutions of all kinds, we invite architects to turn to us for assistance (without obligation). The service may include cost and wiring estimates, engineering aid, complete kitchen layouts, complete specifications, or even sales help in presenting a proposal to a client or prospective client.

Edison specialists are in close touch with building and remodeling operations throughout the country and are often in a position to reciprocate the co-operation offered them by architects.

NOTE: *Our policy is to recommend "adequate equipment at minimum expense."*

• **WHY OUTSTANDING ARCHITECTS SPECIFY EDISON HOTPOINT COMMERCIAL APPLIANCES**—

Because the heating element of our commercial equipment is the long-life Calrod unit (see p. 6). The ruggedness, speed and dependability of this efficient unit are the architect's best guarantee of satisfaction.

Because of the simple, dependable, automatic temperature control mechanism.

Because we make an all-inclusive line. Two distinct advantages result:

(1) Kitchens may be planned as units.

(2) Sizeable savings derive from the advantage of lump-sum bids from a single manufacturer.

Because of the proven-in-service sturdy construction of Edison Hotpoint appliances.

Because, as in the case of Hotpoint domestic equipment, the commercial line comes with a year's guarantee against defect, provided it is properly installed.

Because Edison Hotpoint has thousands of successful commercial installations to its credit.

EDISON Hotpoint "HUSKY" RANGE

Model RA170

DESCRIPTION—Designed for hard and continuous service, the husky is a sectional-type range of extraordinarily wide adaptability. While it is definitely in the heavy duty category, it is also the great "borderline" range, for installations in such "in-between" uses as very large residences, small restaurants, small hospitals, community buildings, tea rooms, wayside inns, church vestries, etc.—installation wherever food for fifteen persons or more is to be prepared.

Installed in banks, it is admirably adapted to all larger kitchen demands.

SECTIONAL CONSTRUCTION—Cooking top, oven and backshelf (with or without salamander broiler) are all independent units. The cooking top may be used independently, mounted on a frame of the client's own construction or on oven section or storage base as client desires. Backshelves are optional. 10 x 10-in. Hi-speed Calrod units, 10 x 10-in. Calrod hotplate, 10 x 20 and 20 x 20 automatic griddles.

These four distinct top units may be assembled in the "Husky" cooking top to form many different combinations.

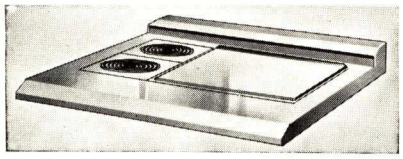
CUSTOM TOP—Can be adapted to any condition from the hamburger stand (large griddle, small, high-speed cooking service) to the large institution with its bulk cooking requirements.

Oven dimensions (inner lining) 12 in. high, 27½ in. deep, 22¾ in. high. For other dimensions see diagrams.

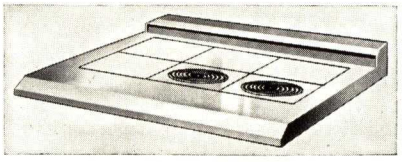
WATTAGE—Rating, oven section 6 kw.; each Hi-speed Calrod unit, 2.1 kw.; each hotplate 2 kw.; 10 x 20-in. griddle, 2.5 kw., 20 x 20-in. griddle, 4 kw.

STANDARD VOLTAGE—197, 219 or 220/240 volts, single or 3-phase or d.c. circuit.

FINISH—Polished steel top, black japan body.



The Fry Cook's Range



Second Cook's Range

In Center, the "Husky" Is Shown with General Purpose Top Assembly. At Left and Right, Two of the Variations

NA57-Automatic

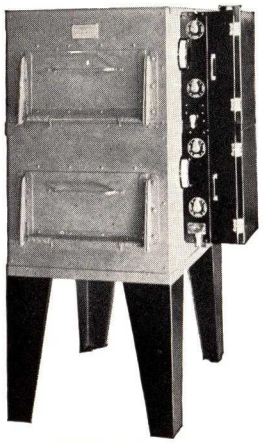
CLASSIFICATION—"Ad-A-Deck" Portable Baking Oven, Sectional Type.

DIMENSIONS—62¼ in. wide, 75 in. deep, 77 in. high. Each compartment 37⅜ in. wide, 57 in. deep, 8 in. high.

CAPACITY—Baking area, 45 sq. ft. (120 1-lb. loaves).

WATTAGE AND VOLTAGE—16.2 kw. standard voltage—105/115, 116/125, 190/210, 211/230, 231/250 a-c. (single or 3-phase) or d-c. circuit.

FINISH—Standard, battleship gray—black enamel trim. Special, monel or nickel-chromium steel, with trim to match.



NA67-Automatic

CLASSIFICATION—Utility Baking Oven.

DIMENSIONS—38 in. wide, 39 in. deep, 65½ in. high. Each compartment 18½ in. wide, 28½ in. deep, 8 in. high.

CAPACITY—Baking area, 7 sq. ft. (20 1-lb. loaves).

WATTAGE AND VOLTAGE—5 kw. standard voltage—105/115, 116/125, 190/210, 211/230, 231/250 a-c. (single or 3-phase) or d-c. circuit.

FINISH—Standard, battleship gray—black enamel trim. Special, monel or nickel-chromium steel, with trim to match.

NA123-Automatic

CLASSIFICATION—"Ad-A-Deck" Portable Roasting Oven, Sectional Type.

DIMENSIONS—56 9/16 in. wide, 40 9/16 in. deep, 62 in. high. Each compartment 37⅜ in. wide, 28¾ in. deep, 12 in. high.

CAPACITY—Roasting area, 14 sq. ft. (250 lb. meat, or 40 1-lb. loaves).

WATTAGE AND VOLTAGE—10 kw. standard voltage—105/115, 116/125, 190/210, 211/230, 231/250 a-c. (single or 3-phase) or d-c. circuit.

FINISH—Standard, battleship gray—black enamel trim. Special, monel or nickel-chromium steel with trim to match.

K32-Automatic

CLASSIFICATION—Fry Kettle

DIMENSIONS—20 in. wide, 29 9/16 in. deep, 32 in. high. Fat container (less foam compartment), width, 14¼ in., front to back, **12¼ in. foam compartment, width, 17¼** in.; front to back, 15¾ in.

CAPACITY—Fat—25 lbs.

WATTAGE AND VOLTAGE—7 kw. standard voltage—110/120, 197/219 or 220/240; single phase, 2 phases of a three phase a-c. circuit, or d-c.

FINISH—Standard, black japan-polished steel top. Special, polished monel or nickel-chromium steel base.

HOT FOOD STORAGE RECEPTACLES

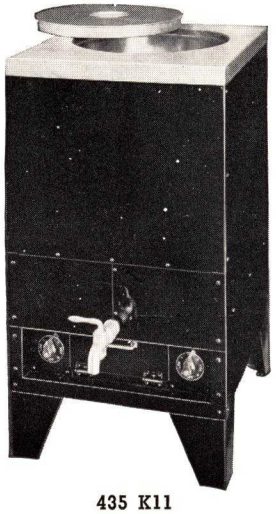
NOTE: *Each counter ensemble is specially constructed to meet particular needs.*

Round Food Jars, 4, 7, or 10½ qt. Rectangular Counter Meat Pans, No. 200 (12 x 20 in.) and No. 165 (9 x 16 in.). Pans may be standard, divided, or 2 half pans.

AUTOMATIC TEMPERATURE CONTROL—Each receptacle has adjustable thermostat, controlling Calrod units. Each may be turned on or off separately.

CONSTRUCTION—Receptacles are aluminum castings with Calrod cast in bottom. All sides and bottom enclosed in a housing of galvanized sheet metal, forming an efficient dead air space insulation.

VOLTAGE—Either high voltage 200/240 or low voltage 100/120. Either a-c. or d-c.



435 K11

CLASSIFICATION—Stock Kettle.

DIMENSIONS—24 in. wide, 27 in. deep, 44¼ in. high. Diameter of container, 18¾ in.

CAPACITY—20 gal.

WATTAGE AND VOLTAGE—5 kw. standard voltage—110/120, 197/219, or 220/240 a-c. (single phase) or d-c. circuit.

FINISH—Body—black enamel; top—polished nickel.

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•EDISON•GENERAL•ELECTRIC•APPLIANCE•COMPANY•INC•

District Sales Offices

ATLANTA, GA., 304 Red Rock Bldg.
BOSTON, MASS., 38 Chauncy St.
CHICAGO, ILL., 5600 W. Taylor St.
CLEVELAND, O., 701 Union Trust Bldg.
DALLAS, TEX., 1801 N. Lamar St.
KANSAS CITY, MO., Rm. 2410, 106 W. 14th St.
LOS ANGELES, CALIF., 601 W. 5th St.
MINNEAPOLIS, MINN., 301 W. 7th St.
NEW YORK, N. Y., Rm. 1102, 570 Lexington Ave.
PHILADELPHIA, Pa., 17th and Sansom Sts.
SALT LAKE CITY, 1218 Cont'l Bank Bldg.
SEATTLE, WASH., 1411 4th Avenue Bldg.

Distributors

ALBANY, N. Y.: Havens Electric Co., 31 Hudson Ave.
ALLENTOWN, PA.: Graybar Electric Co., 110 Hamilton St.
AMARILLO, TEX.: Gen. Elec. Sy. Corp., 113-115 Polk St.
APPLETON, WIS.: Gen. Elec. Sy. Corp., 507 W. Washington St.
ATLANTA, GA.: Gen. Elec. Sy. Corp., 172 Haynes St., S. W.
ATLANTIC CITY, N. J.: Elliott-Lewis (Correspond with E. G. E., Phila.)
ATLANTIC CITY, N. J.: Gen. Elec. Sy. Corp. (Correspond with Phila.)
BALTIMORE, MD.: Simon Distributing, 1305 Cathedral St.
BATTLE CREEK, MICH.: Central Elec. Supply, 10 W. State St.
BINGHAMTON, N. Y.: Southern Tier Elec. Sy., 188 State St.
BIRMINGHAM, ALA.: Graybar Electric Co., 1529 First Ave., N.
BLUEFIELD, W. VA.: Bluefield Supply Co.
BOSTON, MASS.: Gen. Elec Sy. Corp., 378 Stuart St.
BRIDGEPORT, CONN.: Gen. Elec. Sy. Corp., 291 John St.
BUFFALO., N. Y.: Gen. Elec. Sy. Corp., 151 W. Mohawk St.
BUTTE, MONT.: Graybar Electric Co., Harrison and E. Front Sts.
CEDAR RAPIDS, IA.: Terry-Durin Co., 409 Seventh Ave.
CHARLOTTE, N. C.: Gen. Elec. Sy. Corp., 421 Penman St.
CHARLESTON, W. VA.: % Charleston Tractor & Equipment Co., Elizabeth St., and N. Y. C. R. R., Bluefield Sy. Co.
CHATTANOOGA, TENN.: Edison G. E. Appl. Co., 422 West 17th St.
CHICAGO, ILL.: Gen. Elec. Sy. Corp., 350 N. Ogden Ave.
CINCINNATI, OHIO: Gen. Elec. Sy. Corp., 215 W. Third St.
CINCINNATI, OHIO: Johnson Elec. Sy. Co., 329 Main St.
CLEVELAND, OHIO: Geo. Worthington Co., 802 St. Clair Ave., N. W.
COLUMBIA, S. C.: Perry-Mann Elec. Co., 1611 Main St.
COLUMBUS, OHIO: Pixley Elec. Sy. Co., 129 E. Chestnut St.
COLUMBUS, OHIO: Gen. Elec. Sy. Corp., 146 N. Third St.
DALLAS, TEX.: Edison Gen. Elec. Appl. Co., Inc., 1801 N. Lamar St.
DAYTON, OHIO: Gen. Elec. Sy. Corp., 601 E. Third St.
DES MOINES, IOWA: Electric Sy. Co., Inc., 316 Court Ave.
DENVER, COL.: Gen. Elec. Sy. Corp., 1429 Eighteenth St.
DETROIT, MICH.: Graybar Electric Co., 55 W. Canfield St.
ELMIRA, N. Y.: Southern Tier Elec. Sy. Co., 107 E. Church St.
EL PASO, TEX.: Gen. Elec. Sy. Corp., 425 W. San Antonio St.
ERIE, PA.: W. A. Case & Son Mfg. Co., 2001 Parade St.
FARGO, N. D.: Fargo Paint & Glass Co., 648 N. P. Ave.
FLINT, MICH.: Graybar Electric Co., 120 E. Third St.
FORT WAYNE, IND.: Protective Elec. Sy. Co., 130 W. Columbia St.
FRESNO, CAL.: Gen. Elec. Sy. Corp., 1117 "N" St.
GRAND RAPIDS, MICH.: Nilsson Dist. Co., 21-31 Ottawa St., N. W.
HARRISBURG, PA.: Graybar Electric Co., 400 S. 2nd St.
HARTFORD, CONN.: Gen. Elec. Sy. Corp., 338 Ann St.
HONOLULU, HAWAII, T. H.: Hawaiian Elec. Co., P.O. Box 2750
HOUSTON, TEX.: Gen. Elec. Sy. Corp., 1312 Live Oak St.
INDIANAPOLIS, IND.: Gen. Elec. Sy. Corp., 326 W. Georgia St.
JACKSON, MISS.: Cabell Elec. Co., 422 Farrish St.
JACKSONVILLE, FLA.: Gen. Elec. Sy. Corp., 530 E. Forsyth St.
JERSEY CITY, N. J.: Gen. Elec. Sy. Corp., 421 Hoboken Ave.
JOPLIN, MO.: Graybar Electric Co. (Correspond with Graybar, Kansas City.)
JOHNSTOWN, PA.: Gen. Elec. Sy. Corp., 216 Deibert St.
KANSAS CITY, MO.: Graybar Electric Co., 1644 Baltimore Ave.
LANCASTER, PA.: Graybar Electric Co. (Correspond with Reading office.)
LITTLE ROCK, ARK.: Gen. Elec. Sy. Corp., 301 E. Markham St.
LOS ANGELES, CAL.: Gen. Elec. Sy. Corp., 385 E. Second St.
LOUISVILLE, KY.: Rietze Dist. Co., 977 Logan St.
MEMPHIS, TENN.: Orgill Bros. & Co., 32-48 W. Calhoun Ave.
MIAMI, FLA.: Gen. Elec. Sy. Corp., 120 N. E. 20th St.
MILWAUKEE, WIS.: Gen. Elec. Sy. Corp., 190 N. Broadway St.
MINNEAPOLIS, MINN.: Edison Gen. Elec. Appl. Co., Inc., 301 N. Seventh St.
MUNCIE, IND.: Gen. Elec. Sy. Corp., 204 E. Willard St.
NEW BEDFORD, MASS.: Gen. Elec. Sy. Corp. (Correspond with Boston.)
NEW HAVEN, CONN.: Gen. Elec. Sy. Corp., 121 Olive St.
NEW ORLEANS, LA.: Mericope Appl. Inc., 728 Poydras St.
NEW YORK, N. Y.: Gen. Elec. Sy. Corp., 585 Hudson St.
NEW YORK, N. Y.: Royal-Eastern Elec. Sy. Co., 16-18 W. 22nd St.
NEWARK, N. J.: Gen. Elec. Sy. Corp., 221 Frelinghuysen Ave.
NORFOLK, VA.: Gen. Elec. Sy. Corp., 267 Bank St.
OKLAHOMA CITY, OKLA.: Graybar Electric Co., 706 W. Main St.
OMAHA, NEB.: Graybar Electric Co., 1120 Capitol Ave.
PHILADELPHIA, PA.: Elliott-Lewis Elec. Co., 1017 Race St.
PHILADELPHIA, PA.: Gen. Elec. Sy. Corp., 429 N. 7th St.
PHOENIX, ARIZ.: Gen. Elec. Sy. Corp., 441 W. Madison St.
PITTSBURGH, PA.: Gen. Elec. Sy. Corp., 420 Duquesne Way
PORTLAND, ORE.: Graybar Electric Co., 809 N. W. Flanders St.
PORTLAND, ORE.: Stubbs Electric Co., 33 N. W. Park Ave.
POUGHKEEPSIE, N. Y.: Electra Supply Co., 365 Mill St.
PROVIDENCE, R. I.: Gen. Elec. Sy. Corp., 60 Pine St.
RALEIGH, N. C.: Gen. Elec. Sy. Corp., 311 W. Martin St.
READING, PA.: Graybar Electric Co., 22 S. 3rd St.
RICHMOND, VA.: Gen. Elec. Sy. Corp., Fourth and Canal Sts.
ROANOKE, VA.: Gen. Elec. Sy. Corp., 515 Park St., S. W.
ROCHESTER, N. Y.: Gen. Elec. Sy. Corp., 67 Mortimer St.
ROCKFORD, ILL.: Gen. Elec. Sy. Corp., 118 S. First St.
ST. JOSEPH, MO.: Graybar Electric Co. (Correspond with Kansas City.)
ST. LOUIS, MO.: Gen. Elec. Sy. Corp., 200 S. Seventh St.
SALT LAKE CITY, UTAH: Graybar Electric Co., 167 W. 2nd So. St.
SAN ANTONIO, TEX.: Graybar Electric Co., Hackberry & Duval Sts.
SAN DIEGO, CAL.: Gen. Elec. Sy. Corp., 205 W. Market St.
SAN FRANCISCO, CAL.: Elec. Kitchen Appl. Co., 560 Ninth St.
SAVANNAH, GA.: Gen. Elec. Sy. Corp., 22 Bay St.
SCRANTON, PA.: Graybar Electric Co., 1302 Electric St.
SEATTLE, WASH.: Graybar Electric Co., King and Occidental Sts.
SEATTLE, WASH.: Mfgrs. Dist. Co., 2026 Third Ave.
SHREVEPORT, LA.: Interstate Electric Co., 300 Spring St.
SIOUX CITY, IA.: Graybar Electric Co. (Correspond with Kansas City)
SOUTH BEND, IND.: South Bend Elec. Co., 114 Western Ave. E.
SPOKANE, WASH.: Graybar Electric Co., 152 S. Post St.
SPRINGFIELD, ILL.: Gen. Elec. Sy. Corp., 1007 E. Jefferson St.
SPRINGFIELD, MASS.: Gen. Elec. Sy. Corp., 555 State St.
SYRACUSE, N. Y.: Langdon & Hughes Elec., 1020 W. Genesee St.
TACOMA, WASH.: Graybar Electric Co., 1214-16 "A" St.
TACOMA, WASH.: Home Electric Co., 1316-18 "A" St.
TAMPA, FLA.: Gen. Elec. Sy. Corp., 604 Ella Mae St.
TERRE HAUTE, IND.: Advance Electric Co., 545 N. 6th St.
TOLEDO, OHIO: Gen. Elec. Sy. Corp., 28 St. Clair St.
TOPEKA, KAN.: Graybar Electric Co. (Correspond with Kansas City.)
TULSA, OKLA.: Graybar Electric Co., 303 Public Service Bldg.
UTICA, N. Y.: Langdon & Hughes Elec. Co., 187 Proctor Blvd.
WASHINGTON, D. C.: Simon Distributing Corp., 2501 "H" St., N. W.
WATERBURY, CONN.: Gen. Elec. Sy. Corp., 72 W. Liberty St.
WICHITA, KAN.: Graybar Electric Co., 323 S. Wichita St.
WILLIAMSPORT, PA.: Graybar Electric Co. (Correspond with Harrisburg.)
WILMINGTON, DEL.: Elliott-Lewis Electric Co. (Correspond with E. G. E., Phila.)
WILMINGTON, DEL.: Gen. Elec. Sy. Corp. (Correspond with Phila.)
WORCESTER, MASS.: Gen. Elec. Sy. Corp., 165 Commercial St.
YOUNGSTOWN, OHIO: Gen. Elec. Sy. Corp., 265 W. Rayen Ave.

Hotpoint

SECTION 28

CONTINUED ⟶

STANDARD GAS EQUIPMENT CORPORATION

Manufacturers of Domestic and Commercial Gas Cooking Equipment—Oriole—Acorn—Vulcan—Smoothtop

18 East 41st Street, NEW YORK, N. Y.

AURORA, ILL. BALTIMORE, MD. BOSTON, MASS. CHICAGO, ILL. LOS ANGELES, CALIF. PHILADELPHIA, PA.

SGE GAS RANGES

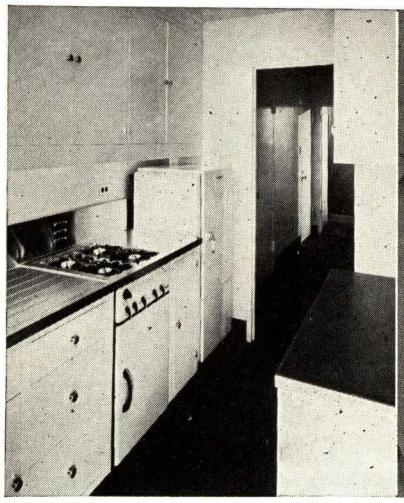
SGE ranges have long been distinguished for the quality of their construction, their modern design and the inclusion of every automatic and other convenience.

The line is complete and includes ranges especially designed to meet the exacting requirements of apartments. Only a few types are shown here. Our 64-page catalog will be sent on request.

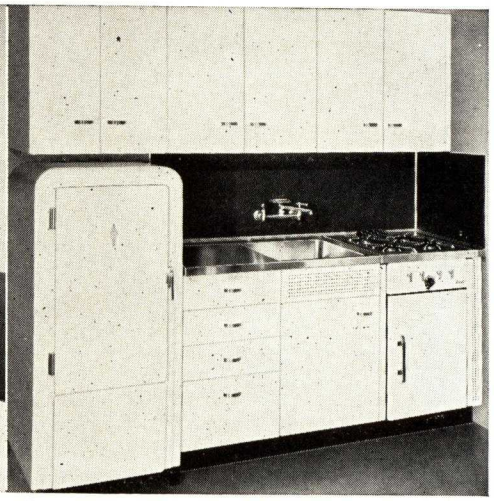
Our Architects and Builders Service Department will be glad to work with you in designing installations to meet special requirements, as it has in many outstanding jobs.

Some SGE Features

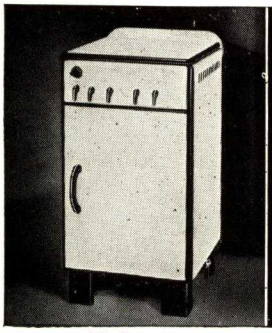
Divided spring-balanced lift covers.
Flush mantle back and sides to give built-in effect.
Lamp, clock and condiment set.
Chromium finished handles and fittings.
Enameled table top full length of range.
Aluminum speed-simmer burners automatically lighted.
High, easily cleaned burner trays.
Elevated smokeless broiler in ball-bearing drawer.
New fast heating oven and broiler burner.
Automatic oven heat control.
Thick, heat-saving rock wool insulation.
Insulated oven bottom.
Non-sag ribbon bar oven racks with safety catch and guard rail.
Enameled lined easily cleaned oven and broiler.
Adjustable door springs outside of range.
Ball-bearing utensil drawers.
Automatic time control if desired.



Installation of SGE Ranges in Rockefeller Apartments, New York

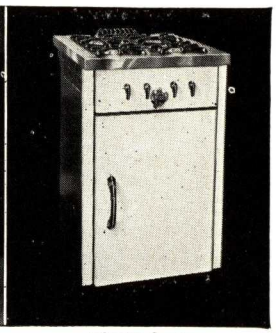


One of Many Ways No. 50 W TB Can Be Used in Kitchen Cabinet Jobs



51 Series

Have same top, oven and broiler capacity as 4-burner range, yet requires space only 19½ in. wide, 26½ in. deep (23½ in. optional)



50-W Series

Same capacity as "51 Series" but specially designed for built-in cabinet work, 21 in. wide, 23 in. deep. Sets on sub-base

Special Note

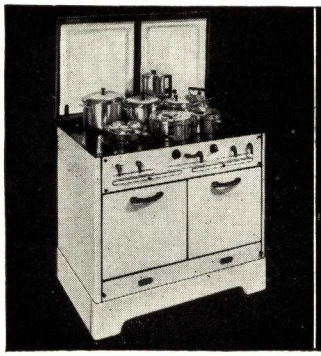
These illustrations show only a few of the 1937 models at time SWEET'S FILE, Architectural, went to press. Ask for 64-page catalog and literature showing all the latest models.

2100 Series

A lower priced line of 37-in. ranges with many Deluxe features, such as smokeless broiler, insulation, heat control, etc., 26½ in. deep

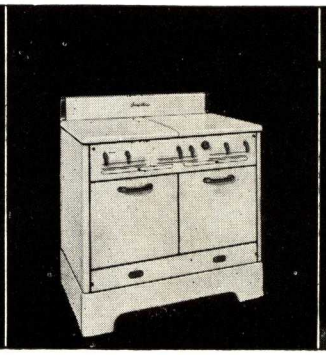
4600 Series

A line that is Deluxe in every respect, yet moderately priced. See list of features at left. 41 in. wide, 28 in. deep



"Smoothtop"

Closed enameled top gives twice top cooking capacity in same space. Three-zone top heat gives greater flexibility and improved cooking results



Smoothtop F-1617 Series

Only 39⅝ in. wide by 30⅜ in. deep, yet has 779 sq. in. top cooking surface. Two insulated heat controlled ovens, one with broiler. Has Deluxe conveniences

Smoothtop F-1620 Series

Large capacity in 45½ in. width by 30⅜ in. depth, 64½ in. high. Elevated warming closet optional. Two insulated heat controlled ovens, one with broiler. Deluxe equipment

Vulcan No. 4705 Combination

For large residences, apartments. Two heat controlled insulated ovens, warming closet, ceramic salamander broiler, "All-Hot-Top," open top and large griddle top. 71½ in. wide, 34¼ in. deep, 72¾ in. high

VULCAN COMMERCIAL GAS COOKING EQUIPMENT

Vulcan has been the leader in its field for nearly 50 years and has pioneered in all major improvements, its latest achievements being the Radial Fin Top gas range and the Multiple Heat Conduit Baking and Roasting Ovens. Faster service, greater capacity, lowered fuel costs, improved working conditions and better results are assured by numerous improvements.

Due to the completeness of the line, entire batteries can be made of Vulcan equipment, assuring uniformity of appearance, greater compactness and increased capacity.

The line includes 10 31¼-in. and 12 40-in. Heavy Duty Ranges; 6 26½-in. and 12 39½-in. Junior Heavy Duty Ranges; high shelves, salamander broilers and other attachments; 6 45½-in. and 6 67½-in. Restaurant Ranges, not illustrated. There are a number of types of ceramic broilers, deep fat fryers, baking and roasting ovens, bakers' stoves, and many kinds of griddles, hot plates. All are shown in 80-page Vulcan Catalog.

Specification Sheets

These can be furnished for most Vulcan numbers on request.

Consulting and Plan Service

We will be glad to submit suggested layouts, based on many years of experience in laying out cooking equipment for thousands of installations, layouts that will save money not only in first cost but also in operating costs. Use this service.

No. 4730 YT Radial Fin Top Range with No. 4784 High Shelf

Heavy Duty range 31¼ in. wide, 41¼ in. deep. Several types of tops. Furnished with or without oven. Made also in 26½-in. width, 34¼ in. deep

Battery of Vulcan All-Hot-Top Ranges

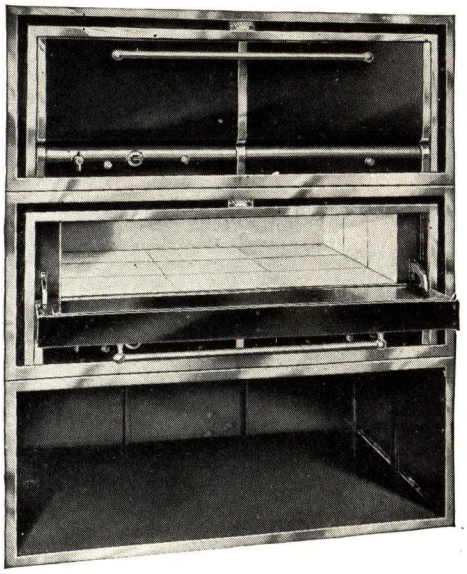
Insulated heat controlled ovens, ceramic salamander broiler; deep fat fryer and heavy duty ceramic broiler in rear. Photos and list of other installations on request

No. 4748 YT All-Hot-Top Range with No. 4709 Ceramic Salamander Broiler

Shows 40-in. width range, 41¼ in. deep. Several types of tops. Furnished with or without oven. Made also in 39½-in. width, 34¼ in. deep

	26½-in. Ranges			31¼-in. Ranges			39½-in. Ranges			40-in. Ranges		
	Wide	Deep	High	Wide	Deep	High	Wide	Deep	High	Wide	Deep	High
Cooking top, in.....	26½	34¼	32¼	31¼	41¼	32¼	39½	34¼	32¼	40	41¼	32¼
Oven, in.....	19½	23½	15	24	28	15	24	23½	15	24	28	15
High shelf (extra).....	26½	13	36½	31¼	15	37⅝	39½	13	36½	40	15	37⅝
Salamander broiler (extra)	26½	16	40½	31¼	19¾	41⅝	39½	16	40½	40	19¾	41⅝

26¼-in. and 31¼-in. ranges made with All-Hot-Top, Open Top and Fry Top. 39½-in. and 40-in. ranges made with All-Hot-Top, Open Top, Fry Top and combinations of these tops.

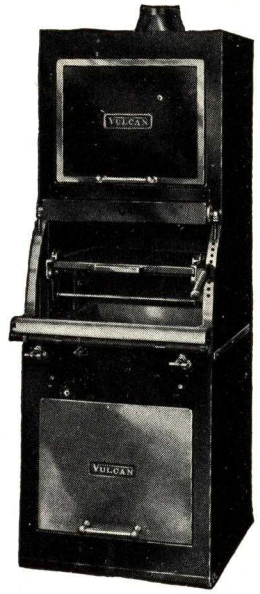


Multiple Heat Conduit Bake Ovens

Latest development in insulated heat controlled ovens. Sectional type 55 in. wide, 47¾ in. deep; two heights 24½ and 21 in. Cabinet type in 3 styles and 2 sizes; 42½ and 51½ in. wide and 35¼ and 46¼ in. deep. Furnished with legs or base

Deep Fat Fryers with Immersed Flues

Assure high quality fried food due to quick heat recovery. Save fat, fuel and food. Two sizes in both single and double unit types. Can be connected in battery with Vulcan equipment. Small counter fryer also



Heavy Duty Ceramic Broiler

Produces superior product due to infra red rays of radiant ceramics. Faster, uses less fuel. Oven top insulated. Two sizes 31¼ in. wide, 35¾ in. deep and 26½ in. wide, 31¼ in. deep. Also made in smaller units, less oven

THE ALUMINUM COOKING UTENSIL CO.

NEW KENSINGTON, PA.

BRANCH OFFICES

BALTIMORE, MD., 137 West Mt. Royal Avenue
BOSTON, MASS., 378 Stuart Street
CHICAGO, ILL., 111 West Washington Street
CLEVELAND, OHIO, 962 Hanna Building
KANSAS CITY, MO., 1107 Dierks Building
MINNEAPOLIS, MINN., 727 First National-Soo Line Building
NEW YORK, N. Y., 330 W. 42nd Street
OAKLAND, CAL., 45th and Adeline Streets
PHILADELPHIA, PA., 1306 Commonwealth Title & Trust Co. Building

Products

"Wear-Ever" Aluminum Steam Jacketed Kettles and Urns; Range Utensils, Service and Special Equipment.

WEAR-EVER TAC ALUMINUM UCO TRADE MARK
Reg. U. S. Pat. Off.

The Company and Its Products

For nearly 40 years The Aluminum Cooking Utensil Co. has manufactured and distributed "Wear-Ever" aluminum cooking utensils for use in homes, hospitals, hotels, on shipboard—everywhere that cooking is done.

Constant use during these years has brought a recognition of the value of aluminum from housekeepers, chefs and stewards.

Advantages

The high heat conductivity and specific heat of aluminum make possible an even cooking temperature.

Never any Tinning—Aluminum never forms a poisonous compound with any food, thus it is unnecessary to tin the surface of a "Wear-Ever" utensil.

Lightness—Aluminum is only one-third the weight of other commonly used metals.

Economy—Low in first cost, "Wear-Ever" utensils are good for years of continuous service. There is no tinning expense and they save substantially on fuel.

Surface Characteristics—"Wear-Ever" Aluminum Equipment is made of dense, hard, wrought plate aluminum. It is easy to clean and, being non-porous, food will not penetrate the metal.

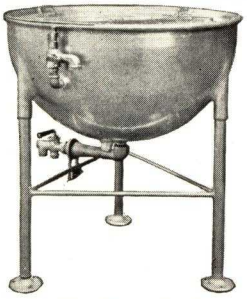
Types of Equipment

Steam Jacketed Kettles* may be had in several styles, many capacities.

Shallow Type—Jacketed to top, insuring maximum cooking results. 5 to 150 gals.

Deep Type—Jacketed two-thirds of the way up; gives maximum capacity for floor space occupied. Sizes from 5 to 300 gals.

*Electrically and gas-heated kettles are also available.



Shallow Type Kettle Showing New Tubular Leg Construction

Trunnion Kettles—Where foods need to be emptied easily; sizes from 10 to 100 gals.

Range Utensils—Made in the regular "heavy duty" line for large institutions and in the "semi-heavy" weight for smaller institutions.

"Service" Equipment—Trays, pitchers, basins, griddle cake covers, thermo service rings, etc.

References

Following is a partial list of hotels and hospitals in which "Wear-Ever" Equipment is installed:

Hotels

Baltimore Hotel, Baltimore, Md.
Washington Hotel, Washington, D. C.
Hotel Taft, New Haven, Conn.
Palmer House, Chicago, Ill.
Hotel Sherman, Chicago, Ill.
Pittsburgher Hotel, Pittsburgh, Pa.
Lennox Hotel, St. Louis, Mo.
Phillips Hotel, Kansas City, Mo.
Nicollet Hotel, Minneapolis, Minn.
Hotel New Yorker, New York, N. Y.
Hotel Park Central, New York, N. Y.
Marlborough-Blenheim Hotel, Atlantic City, N. J.
Biltmore Hotel, Los Angeles, Calif.
St. Francis Hotel, San Francisco, Calif.

Hospitals

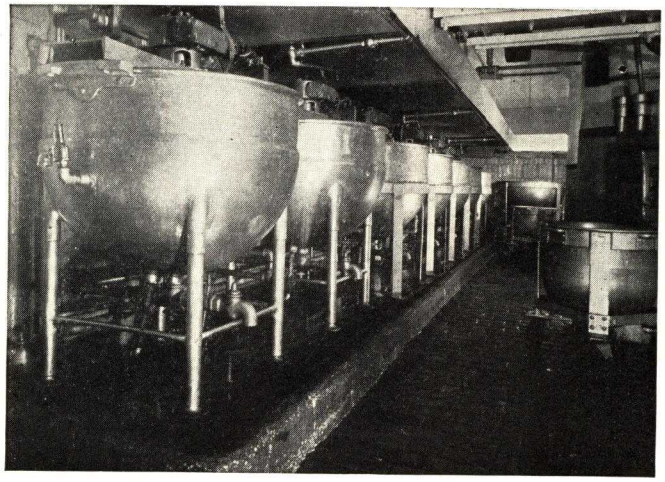
Boston City Hospital, Boston, Mass.
Palmer Memorial Hospital, Boston, Mass.
New Haven Hospital, New Haven, Conn.
Columbia Presbyterian Medical Center, New York, N. Y.
Philadelphia General Hospital, Philadelphia, Pa.
Johns Hopkins Hospital, Baltimore, Md.
Walter Reed Hospital (U.S.A.), Washington, D. C.
Mercy Hospital, Pittsburgh, Pa.
Lakeside Hospital, Milwaukee, Wis.
Firmin Desloge Hospital, St. Louis, Mo.
Barnes Hospital Groups, St. Louis, Mo.
Minneapolis General Hospital, Minneapolis, Minn.
Los Angeles General Hospital, Los Angeles, Calif.
Seattle General Hospital, Seattle, Wash.
Cook County Hospital, Chicago, Ill.

Special Consultation Service

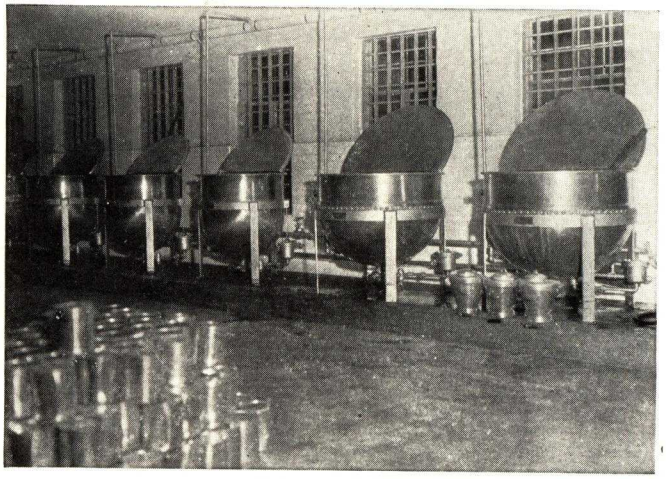
At each of the branch offices listed above, there is a man who, through years of training and experience, is able to render valuable assistance to an architect in laying out kitchen equipments and in writing specifications.

Catalogue

A 42-page catalogue showing the complete line of "Wear-Ever" utensils will be sent promptly on request.



College Inn Food Products Co.—Chicago, Ill.



Florida State Farm

TELEPHONE
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THE PROMETHEUS ELECTRIC CORP.

403 West 13th Street, NEW YORK, N. Y.

ESTABLISHED 1901

Products

ELECTRICAL HEATING, WARMING, DRYING and STERILIZING EQUIPMENT and APPLIANCES, including: Plate Warmers; Combination Plate Warmers and Towel Dryers; Clothes Dryers; Electric Organ Loft Heater; Electric Radiators, with and without Thermostatic Control; Instrument Sterilizers; Blanket and Solution Warmers.

PROMETHEUS

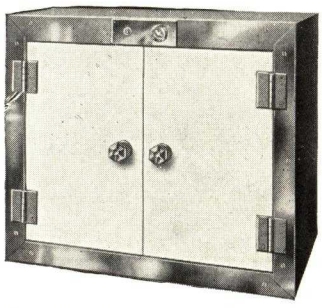
Proved by 35 Years of Service

Prometheus appliances are extensively used in residences, hotels and clubs of the highest class, including the Astor, Cosden, Patterson, Ford, Frick, Harriman, Rockefeller, Schiff, and Vanderbilt residences, the Brook Club, Hotel Sherry-Netherland and the Waldorf-Astoria.

Architects who specify Prometheus specialties include Eberson & Eberson, Delano & Aldrich, Schultze & Weaver, Walker & Gillette, and Charles A. Platt, of New York; Meade & Hamilton of Cleveland; and Hoffman-Henon Co. of Philadelphia. *Write for complete catalog now!*

Prometheus Plate Warmer

Used in the butler's pantry, kitchen, or hospital ward for warming dishes and food. Prevents breakage of china and preserves the original delicious flavor of the food. Operates by a mere turn of the three-heat electric switch—no fire, smoke, steam or odor. *Approved by the National Board of Fire Underwriters.*



Construction — Substantial welded angle iron frame with double walls, thoroughly lagged. Shelves built on heavy iron rod, and supported on angle iron brackets. All interior fittings are removable. Can be had with vitreous enamel doors in white or color, also with monel metal top which can be used as a hot plate. All fittings are chrome plated.

Thermostatic Cut-off and Heating Element—By a patented arrangement, the heating units are contained in shallow flues, attached to the walls of the interior, so that water or gravy which may be spilled can not cause a short circuit. Heating elements never become red-hot. Can also be had with a patented thermostatic cut-off.

Although plate warmers are usually built to architect's specifications, we also make the following stock sizes:

Type	Outside dimensions			Current consumed, watts
	Wide	High	Deep	
801	18″	18″	18″	400
801-A	19″	30″	16″	800
802	25″	24″	18″	800
803	30″	30″	20″	800
804	36″	30″	20″	1000

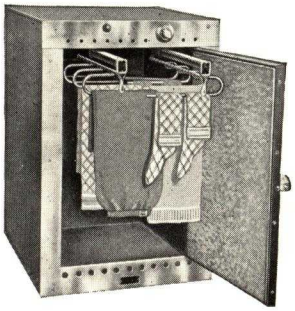
Outside finished in Russia iron. Doors finished in porcelain enamel. All types except No. 800 have chrome plated trimmings. When ordering plate warmers to be built to specifications, kindly give the following information:

Trim Extension—This is the distance the chrome plated trim should extend beyond the body of the plate warmer in order to cover up the crevice between the wall and the plate warmer if the plate warmer is of the built-in type. Otherwise the trim will be flush with the body.

Position of Leads—Leads may be brought out at any specified point.

Voltage—Give voltage of the line.

Blue prints upon request.

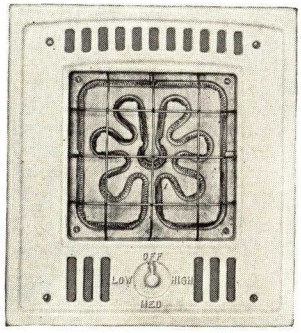


Clothes and Towel Dryer

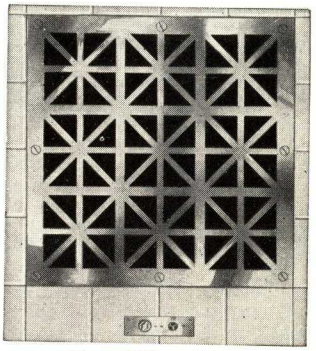
Usually built to order to fit space available. There are two stock sizes: No. 810, 2 towel racks, 20 in. wide; 30 in. high, and 22 in. deep. No. 812, 4 towel rack, 36 in. wide, 30 in. high, and 22 in. deep.

Flush Type Heaters

New Type 370 heater has a heavy cast iron face plate, covered with vitreous porcelain enamel, variety of colors. The three-heat switch is built into heater; heating element is protected with a monel guard. Type 350 heater has a highly polished chrome plated grill. Heating element is the convection type, insuring even distribution of heat.



Type 370 and 371

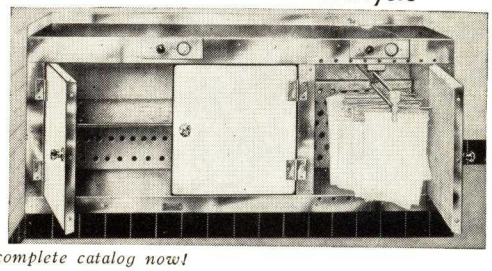


Type 350 and 351

Type No.	Watts	Register		Body		
		Height	Width	Height	Width	Depth
370	1500	16½″	15″	15½″	12″	4″
371	2000	16½″	15″	15½″	12″	4″
350	800	15″	15″	13½″	13½″	3½″
351	1500	15″	15″	13½″	13½″	3½″
361	1000	20″	15″	17″	12″	4¼″
362	2000	20″	15″	17″	12″	4¼″

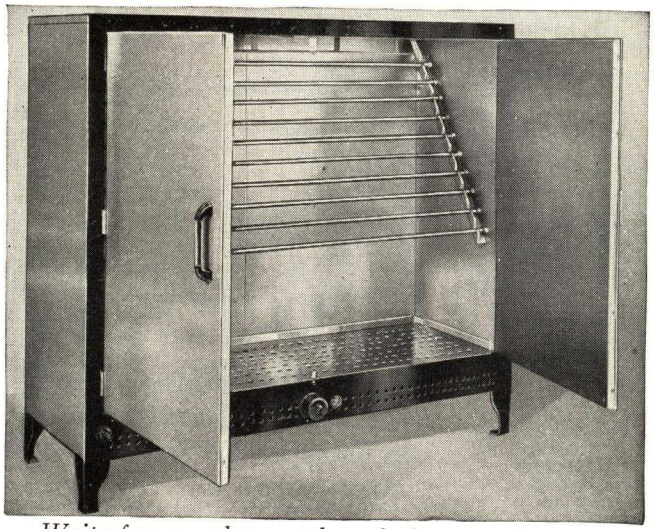
Combination Plate Warmers and Towel Dryers

For kitchens and serving pantries in residences and clubs. They are built in two sections. One has shelves and serves as a plate warming cabinet, while the other, fitted with racks, serves for drying towels. Built to specifications. *Write for complete catalog now!*



Electric Clothes and Laundry Dryer

Sturdily built on substantial angle iron frame covered with heavy rust-resisting steel; removable tubular racks specially treated to resist rust; thermostatic control prevents overheating. Usually built to order. Stock size: width 60 in., depth 24 in., height 72 in.



Write for complete catalog of above products

THE JOHN VAN RANGE CO.

Kitchen Engineers and Manufacturers of Food Service Equipment and Special Stainless Metal Construction

403-413 Culvert Street, CINCINNATI, OHIO

BRANCH OFFICES

ATLANTA, GA. BOSTON, MASS. CLEVELAND, OHIO DETROIT, MICH. KANSAS CITY, MO. MIAMI, FLA.
MUSKOGEE, OKLA. NEW YORK, N. Y. ROCHESTER, N. Y. WASHINGTON, D. C. MEXICO CITY, MEXICO

The Company

THE JOHN VAN RANGE CO.'S position of leadership in the kitchen equipment industry extends back through almost a century of competent performance and honorable dealing. Its lines of products are the result of sound and progressive manufacturing policy. Its service organization combines technical expertness with generations of practical experience. Thousands of the most representative establishments and institutions of this country and in foreign fields are John Van-equipped, and we are pleased to refer you to any or all of them for testimony as to our reliability, responsibility and competence.

Manufacturing Facilities

More important even than modern machinery is the skill of John Van craftsmen, many of whom came to Van as boys. Today, their artisanship is mirrored in every piece of John Van equipment.

Projecting their skill, labor-saving appliances, high powered machinery, experimental laboratories and all the advanced instruments of a scientific manufacturer combine in the production of John Van kitchen equipment.

Its reputation for excellence, durability and economy of operation is worldwide.

JOHN VAN ENGINEERING SERVICE

When THE JOHN VAN RANGE CO. equips a kitchen, it is not acting simply as a manufacturer but as a trained service organization. Our corps of food service specialists, engineers and technical experts constitute a service staff which is in position to handle the *complete planning and installation* of everything necessary to transform the bare room into a food service establishment ready for operation.

Throughout our connection with the project *and particularly in the early planning stages,* the experienced counsel of our executives and specialists is available in connection with matters such as organization, operation, space requirements, proportioning of facilities, preparation of preliminary plans, etc. We have acted in this capacity in connection with many of the country's largest installations.

In undertaking the outfitting of a kitchen we begin by a careful study: of the kind of service, as, for instance, the number of patients of hospital or institution; of variety of food served; of the architectural plans; and an analysis of the type, size and location of the restaurant space, the kind of facilities and type of equipment desired, and all other factors upon which a successful outfitting scheme depends. With this study as a foundation and with the experience of hundreds of such installations as a background, our engineers will prepare complete plans, layouts and specifications for the restaurant, kitchen, refrigerators, storerooms and all other food service departments, providing the architect with the necessary data concerning plumbing, wiring and steamfitting connections, and for lighting, sanitation, ventilating and other matters of this kind.

Special Technical Literature

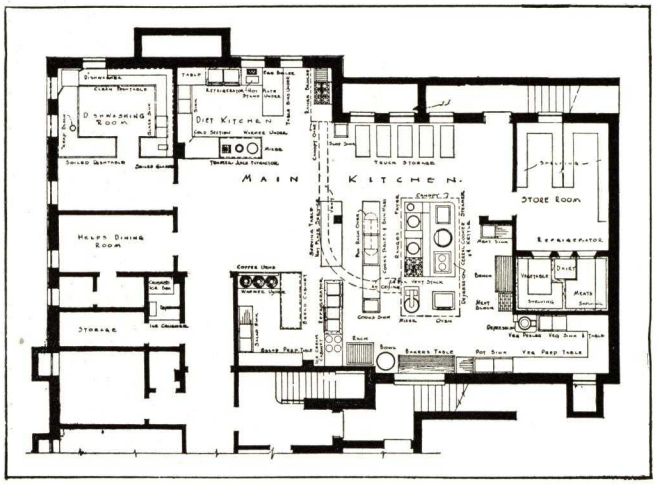
Each class of establishment has problems peculiar to itself. Equipment and layout suitable for a cafeteria or schoolhouse may be ill-adapted to the requirements of a hotel. Hospitals require special food equipment, both for the staff and for floor service and diet kitchen.

Counsel for Architects

In planning the equipment and arrangement of the new Kitchen and Service Building of the $10,000,000 Boston City Hospital, the architects, James H. Ritchie and Associates, Boston, availed themselves of the assistance of the John Van Range Kitchen Engineering Service. The section plan, shown at left, gives evidence of the result of this combined effort. The John Van organization assisted the architects in detailing the plans for equipment to provide 12,000 meals daily, including everything from a diversified dietary room service to the feeding of the help—and then manufactured and installed the equipment for the preparation and serving of food.

Whether the job is large or small, feel sure that the John Van organization welcomes the opportunity to co-operate. Architects generally, even if they only face the problem of food service floors occasionally, make full use of John Van's ninety years' experience.

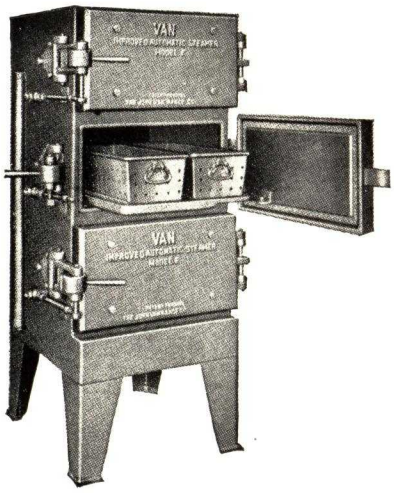
As soon as they draw the plans for the food service floors they commonly call into consultation our kitchen engineers. There is no obligation entailed. Waste of space can be avoided without crowding. Economy of food preparation and service can be worked out provided the kitchen engineer is summoned before planning is too far advanced. John Van engineers are accustomed to working with the architects and can furnish authentic data and sketches on the job.



Coal Valley Hospital (W. Va.) Kitchen
WARREN, TUCKER & SILLING, Architects, Charleston, W. Va.

Sectional View, Kitchen, Boston City Hospital
JAMES H. RITCHIE and ASSOCIATES, Architects

Standard Kitchen Items



This new standard improved John Van Steamer is designed for cooking at atmospheric pressure using steam reduced to 10 lbs. line pressure. Can also be furnished with necessary valves, traps, safety valves and gauges for cooking under pressure of 15 lbs. if so desired.

Four bolts make adjustment easy. Extra heavy gasket (¾ x ¾ in.) gives extra protection. Gaskets easily replaced.

Exclusive John Van Safety Lock makes it impossible to open door while steam is on.

Items of Moderne Design

The illustration shows a cafeteria counter with stainless metal trim and inset equipment. Custom-built for the specific requirements of the installation. Note that the panels are appropriate in design to the fluted legs, all in keeping with the balance of the installation. This piece is typical of the John Van abilities of design and craftsmanship. High manufacturing standards parallel good taste in design.

Stainless Steel Architectural Specialties

Illustration shows stainless elements made by John Van for a modern steel structure. We gladly consult with architects on design of stainless metal louvers, spandrels, pilasters, columns, structural sign letters, cornices, mouldings, ceilings, and the like. The long experience of this company in fabrication of stainless metal kitchen equipment assures our ability to co-operate on design and manufacture of such structural specialties.

Residential as Well as Commercial

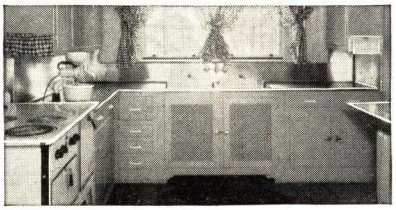


Illustration shows stainless metal sinks and counter tops, custom-made and installed by John Van. This is an example of the conditions which architects planning large residences, frequently meet when they come to the kitchen. Special situations make stock stainless kitchen equipment, sinks, counter tops, work tables, etc., scarcely usable without compromising on the plan for the kitchen. John Van welcomes the opportunity to assist in custom design and manufacture of custom-made equipment of this character.

CHARACTER OF JOHN VAN INSTALLATIONS BELOW INSPIRES CONFIDENCE

We will be pleased to furnish any architect with a list of John Van installations in his district if none of those shown below are convenient. Visit and examine carefully the kitchens and dining rooms of these buildings for evidence of the high standards of kitchen engineering, design, manufacturing and installation, set by this company.

Building and Location	Architect
Northeast	
U. S. Coast Guard Academy, New London, Conn.	James A. Wetmore
Boston City Hospital, Boston, Mass.	Jas. H. Ritchie & Assoc.
Malden Hospital, Malden, Mass.	Kendall, Taylor & Co.
Westfield State Sanatorium, Westfield, Mass.	John M. Gray Co.
Springfield Hospital, Springfield, Mass.	Stevens & Lee and Consultant Chas. F. Neegaard
East	
Lord Baltimore Hotel, Baltimore, Md.	W. L. Stoddart
Ewarts Cafeteria, Philadelphia, Pa.	Max Bernhardt
Brooklyn Technical High School, Brooklyn, N. Y.	Walter C. Martin
Cloud Club, Inc., New York, N. Y.	William Van Alen
First National Bank, New York, N. Y.	Walker & Gillette
Hotel New Yorker, New York, N. Y.	Sugarman & Berger
Lincoln Hospital, New York, N. Y.	Charles B. Meyers
Seabury Hall, General Theological Seminary, New York, N. Y.	E. L. Tilton and A. M. Githens
Pittsburgh Bell Telephone Co., Pittsburgh, Pa.	John T. Windrim
Southeast	
Surf Club, Miami Beach, Fla.	Russell T. Pancoast
Atlanta University, Atlanta, Ga.	James Gamble Rogers
Duke University, Durham, N. C.	Horace Trumbauer and Paul Cret
Chesapeake & Potomac Telephone Bldg., Charlestown, W. Va.	Meanor & Handloser
St. Josephs Hospital, Parkersburg, W. Va.	Fox, Duthie & Foose
West Virginia University Dormitory, Morgantown, W. Va.	Warne, Tucker & Silling
Southwest	
Skirvin Hotel, Oklahoma City, Okla.	Layton, Hicks & Forsyth
University of Texas, Austin, Tex.	Robert Leon White
Oklahoma Agricultural & Mechanical College, Stillwater, Okla.	Philip A. Wilbur

Building and Location	Architect
South	
Flint Goodridge Hospital, New Orleans, La.	Moise H. Goldstein
National Hotel, Havana, Cuba	McKim, Meade & White
Central	
Chicago Union Station, Chicago, Ill.	Graham, Anderson, Probst & White
St. Vincent Orphanage, Chicago, Ill.	Holabird & Root
The Wm. H. Block Co., Indianapolis, Ind.	Vonnegut, Bohn & Mueller
Lincoln Hotel, Indianapolis, Ind.	Rubush & Hunter
Eli Lilly & Co., Indianapolis, Ind.	Robert Frost Daggett
St. Meinrad Abbey, St. Meinrad, Ind.	Crowe & Schulte
Eloise Infirmary, Eloise, Mich.: Infirmary Building Hospital Building	Nathaniel O. Gould Maul & Lentz
Henry Ford Hospital, Detroit, Mich.	Albert Kahn, Inc.
General Motors Corp. (Numerous), Detroit, Mich.	Albert Kahn, Inc.
Polsky Department Store, Akron, Ohio	Starrett & Van Vleck
Higbee Department Store, Cleveland, Ohio	Graham, Anderson, Probst & White
Frigidaire Division, General Motors Corp., Plant No. 2, Morain, Ohio	Schenk & Williams
National Town and Country Club, Cleveland, Ohio	Geo. B. Post & Sons
University of Cincinnati, Students Service Bldg., Cincinnati, Ohio	Harry Hake & Harry Hake, Jr.
Netherland Plaza, Cincinnati, Ohio	Walter W. Ahlschlager
Union Gas & Electric Co., Cincinnati, Ohio	Geo. B. Post & Sons and Harry Hake
The John Shillito Co., Cincinnati, Ohio	Potter, Tyler & Martin
Western & Southern Life Insurance Co., Cincinnati, Ohio	Samuel Hannaford & Sons
Foreign	
Morris Schinasi International Hospital, Manisa, Turkey	Thompson & Churchill and Morris B. Sanders, Jr.

COLT'S PATENT FIRE ARMS MFG. CO

AUTOSAN MACHINE DIVISION

Colt Autosan Dishwashing Machines for China, Glassware and Silverware

HARTFORD, CONN.

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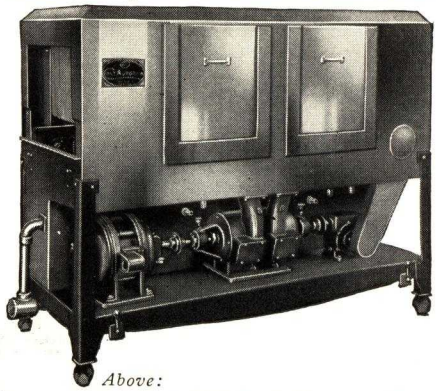
DALLAS, TEX., 3736 Granada — ST. PAUL, MINN., 1805 E. Minnehaha Street

COLT AUTOSAN

In planning space for a modern kitchen, nothing is more important than a thorough knowledge of kitchen equipment and its space requirements. Ovens, ranges, tables, dishwashing units—these and many other items must be assembled for efficiency, convenience and low-cost operation. The Colt Autosan appeals to architects because it does more and better work at less cost. In recommending the Autosan to clients, you can feel certain that the same skill and precision, the same high quality of material which has distinguished Colt workmanship through a century of manufacturing experience, enter into the making of every Autosan Unit.

There Is a Colt Autosan for Every Kitchen

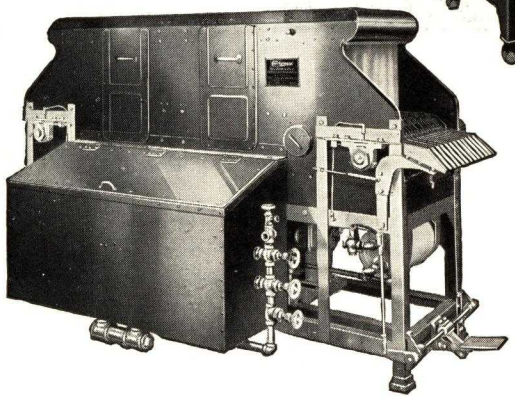
There are 15 Colt Autosan models. For small space kitchens there are 7 different units. There are 8 models that operate automatically and there are 2 units with link conveyors. In this line you will find exactly the size and type needed to handle all the tableware required to serve from 30 to 3,000 persons per meal. High quality of material and construction make the Autosan unusually rugged—built for long years of the hardest kind of service. Powerful, direct sprays from above and below thoroughly wash and rinse all tableware. The Autosan is foolproof in operation—a unit that can be depended upon for smooth and uninterrupted service.



Above:

Model "R-4" Rack Conveyor Type

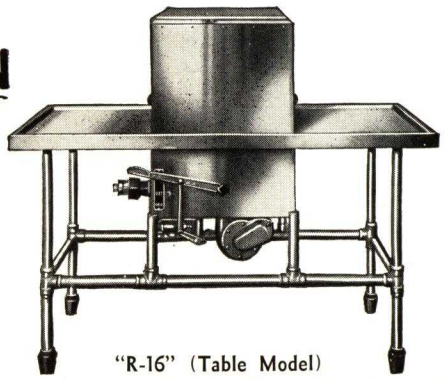
Capacity far beyond expectations. Only 70 by 30-in. floor space. Handles tableware for 1500 persons per meal. Racks carried by chain conveyors. Smooth and uninterrupted service



Left:

Model "C-22" (Conveyor Type)

Handles tableware for 2000 persons per meal. It washes, rinses and sterilizes quickly, economically. Colt Autosan conveyor prevents breakage or chipping. A money-saving unit



"R-16" (Table Model)

A compact, complete washing unit, with wash and rinse sprays above and below. It is equipped with vertically sliding doors. For straightaway operation. Handles tableware required for up to 100 persons per meal. Stainless steel, simple in design and efficient in operation. Furnished with table or standard, or dishwashing unit only

Right:

Model "R-1" (Rack Type)

Designed to wash and sterilize tableware for 500 persons per meal. Furnished for either corner or straightaway operation. Simple in design, few moving parts, easily operated. Ideal where space is at a premium

Special Service to Architects

Our sales and engineering staffs co-operate with architects in the solution of difficult problems in kitchen planning. They recommend units best suited, and suggest methods which lower the cost of installation, operation and maintenance.

COLT AUTOSAN DISHWASHING MACHINES

Model	R-16	RX-1	RX-1-P	R-1	R-1-P	RC-1	RC-1-P	R-2	R-4	RM-4	R-6	R-8	RM-8	C-22	C-3
Type	Table	Rack	Rack	Rack	Rack	Rack-conveyor	Rack-conveyor	Rack-conv'r	Rack-conv'r	Rack-manual	Rack-conv'r	Rack-conv'r	Rack-manual	Belt Conveyor	Belt Conveyor
Capacity—persons per meal (cafeteria service)	100	500	500	500	500	500	500	1100	1500	1200	1500	2000	2000	2000	3000
Length (between tables)	21″	42″	42″	27″	27″	42″	42″	60″	70″	70″	80″	100″	100″	87″	120″
Width (table height)	21″	27″	27″	27″	27″	27″	27″	30″	30″	30″	30″	32″	32″	50″ (overall)	50″ (overall)
Height over all	37½″	54″	54″	60½″	60½″	62″	62″	59″	59″	59″	59″	59″	59″	59″	59″
Motor hp.	½	¾	¾	¾	¾	¾ for pump ⅛ for drive	¾ for pump ⅛ for drive	2	3	3	3	5	5	2	3
Motor operating cost @ 5c per kw.	.02	.03	.03	.03	.03	.03	.03	.075	.11	.11	.11	.17	.17	.075	.11
Number of tanks	1	1	1	1	1	1	1	1	2	2	2	2	2	2	3
Tank capacity (total)	7½ gal.	20 gal.	20 gal.	20 gal.	20 gal.	20 gal.	20 gal.	46 gal.	54 gal.	54 gal.	62 gal.	84 gal.	84 gal.	58 gal.	90 gal.
Pump capacity (gpm)	100	140	140	140	140	140	140	300	450	450	450	550	550	275	415
Conveyor width														22″	22″
Speed of conveyor						Wash 4 ft. per min. Rinse 8 ft. per min.	Wash 4 ft. per min. Rinse 8 ft. per min.	8 ft. per min.	10 ft. per min.		12 ft. per min.	15 ft. per min.		16 ft. per min.	17½ ft. per min.
Heating (std. equipment)	Electric*	Steam or gas**	Steam or gas**	Steam or gas**	Steam or gas**	Steam or gas**	Steam or gas**	Steam†	Steam†	Steam†	Steam†	Steam‡	Steam‡	Steam†	Steam‡
Net weight (approx.)	190 lb.	450 lb.	450 lb.	575 lb.	575 lb.	485 lb.	485 lb.	1225 lb.	1450 lb.	1375 lb.	1500 lb.	1900 lb.	1850 lb.	2075 lb.	2950 lb.

*Steam can be substituted at no extra cost. **Combination steam and gas, or electrically heated, at extra cost. †Gas, combination steam and gas, or electrically heated at extra cost. ‡Models R-8, RM-8 and C-3 not furnished for gas or electricity.

Write for Autosan Architects Portfolio containing complete information, drawings and specifications for all models.

THE HOBART MANUFACTURING CO.

Makers of Electric Food-preparing and Dishwashing Machines for Commercial and Institutional Kitchens and Bakeries Sold Through Leading Kitchen Outfitters

TROY, OHIO

NEW YORK OFFICE, 71 Madison Avenue — CHICAGO OFFICE, 61 Wacker Drive

Sales and Service Offices in All Principal Cities (Consult Telephone Directories)

Hobart Mixers

Built in 3, 5, 10, 12, 15, 20, 30, 40, 60, 80 and 110-quart bowl capacities. There is a model to meet any kitchen or bakery need. They mix, beat, whip, blend, mash. With attachments they chop, grind, slice, shred, grate, crumb, sieve, strain, etc.

Hobart Air Whip Attachment for Hobart Mixers only, supplies advantages in regular mixing bowl operations by better aeration; improves cake quality tremendously; reduces mixing time as much as 30% to 40%.

Hobart-Crescent Glass and Dishwashers

Made in a wide range of automatic and semi-automatic models, to meet the smallest or largest demand. They wash all tableware *clean* with a high degree of sterilization in the shortest possible time. They carry such exclusive features as revolving wash arms and the patented Dual-Drive conveyor.

Hobart Slicing Machines

The Hobart Electric Ball Bearing Slicing Machine combines the latest features in one machine. Ideal for all boneless meats, hot or cold, cooked or uncooked, bread, cheese, vegetables, fruits, etc. Convenient to operate, speedy, quiet, and easy to clean. Maximum safety. New model in black and white Dulux, with Hobart Staysharp Stainless Steel Knife.

Hobart Air Whip Unit

The new Hobart Air Whip introduces a superior method of whipping cream. In a few seconds it produces 3 or more quarts of whipped cream from 1 quart of liquid cream. It whips by *air,* keeping all the freshness and sweetness of the cream. More and better whipped cream dishes can be made at less cost and whipped cream can be served more generously.

Hobart Potato Peelers

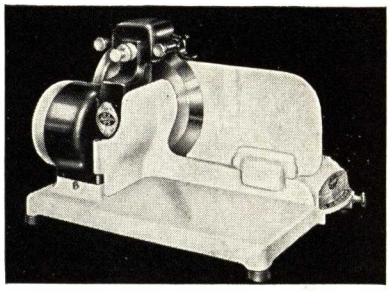
Hobart Potato Peelers bring new savings in time and food costs. There are three sizes, with capacities from 15 to 45 lbs. peeled in "no time" with negligible peel loss. Quiet, speedy and water-tight, they can also be used for sweet potatoes, carrots, parsnips, turnips, etc.

Hobart Food Cutters

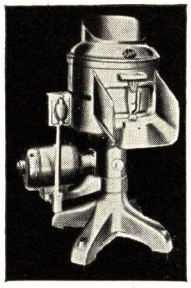
Hobart Food Cutters embody distinct advances in speed, thoroughness, safety, ease of cleaning and economy of space. They cut meats, vegetables, firm fruits, cocoanuts, citron, nuts, boiled eggs, beets—practically anything in the food line, uniformly, in a few seconds' time.

Guarantee and Service

A distinct advantage to the kitchen and bakery which is standardized with Hobart Equipment is that all Hobart Machines are fully guaranteed and serviced by *one* nationwide organization. This avoids uncertainty, confusion and money-losing delays. The Hobart Engineering and Research Departments are always ready to co-operate with architects. The Architect's Data Book, A.I.A. File No. 31H2, which contains weights, dimensions, capacities and technical details of Hobart Machines, is furnished on request.

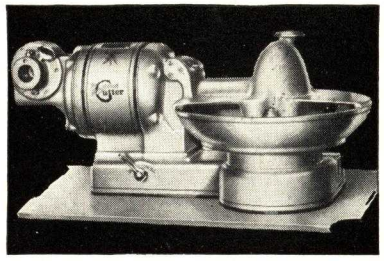


Hobart Model 110 Slicing Machine
In black and white Dulux, with Staysharp Stainless Steel Knife

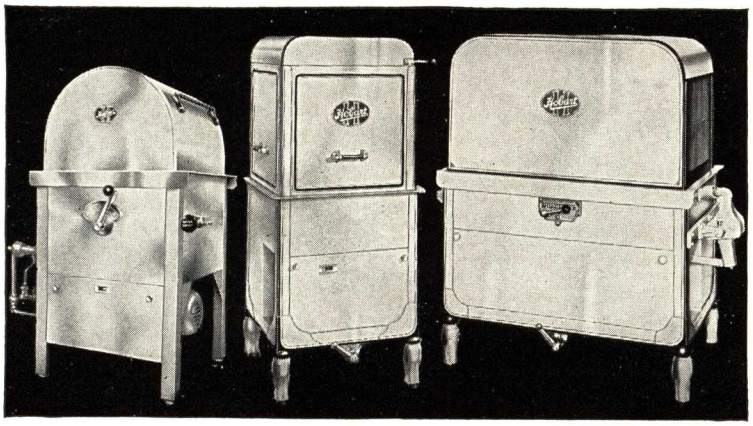


Hobart Potato Peelers
Pay as they peel, quickly. Model 6025 shown. Also furnished in Bench Type Model

Hobart Air Whip Unit
At the snap of the switch makes 3 or more quarts of better whipped cream from 1 quart of liquid cream

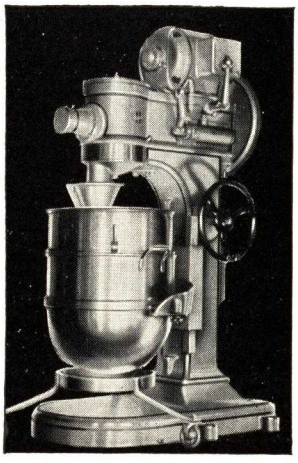


Hobart Food Cutter
Low-priced, small model. Two other sizes



Hobart Crescent Dishwashers: Model LM, Model AM-5, and Model XM-2
Model LM, new low-priced unit for busy kitchens. Model AM-5 De Luxe Dishwasher with advanced features. Model XM-2 fully automatic with Dual-Drive Conveyor, washes thousands of dishes quickly

Hobart Model A-200 Mixer
The equivalent of two mixers in one. Bench type machine. 20 and 12-qt. bowls



Hobart M-80 Super-Mixer
Bowl capacity up to 110 qts. 20, 30, 40, 80-qt. bowls interchangeable

HERMAN SOELLNER, INC.

Honeycomb Bottle Racks

TELEPHONE
VOlunteer 5-4975

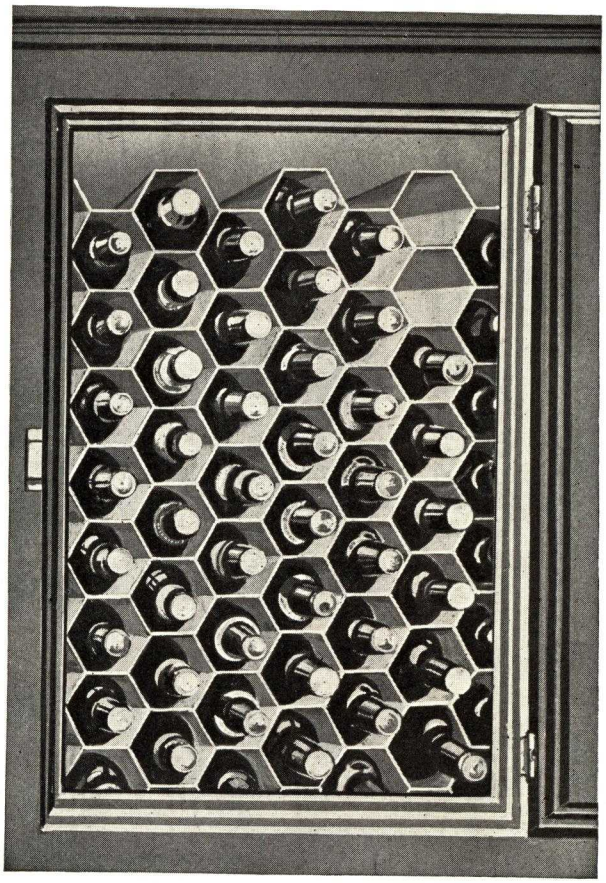
336 East 59th Street (At the Queensboro Bridge)
NEW YORK, N. Y.

BRANCH OFFICE: MUNICH, GERMANY, HALLMAIERSTRASSE, 8

HONEYCOMB (HEXAGONAL) BOTTLE RACKS

Sheet metal, hexagonal shelving, made to measure or furnished from stock in standard sizes.

Shipped knocked down (nested in small, closed boxes); ready for re-assembling at the rate of over one thousand cells a day by a novice.



Advantages

Bottles are securely held within individual cells, within plain sight and convenient reach.

Corks are kept wet and tight, thus retaining gas-pressure and quality of contents.

Save 40% of wall space. More economical than wooden shelving.

Service

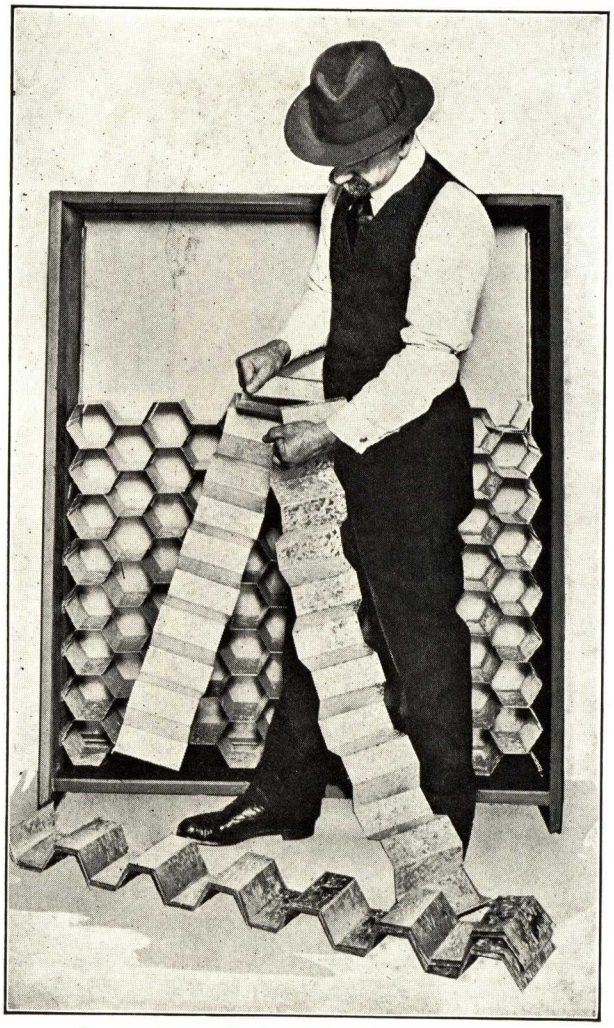
Twenty-one years' faultless record for local, long distance and export service attested to by architects from coast to coast.

Illustrated pamphlets, plans, estimates and practical suggestions for stockrooms and wine cellars free of charge.

Your inquiries will receive our prompt attention.

Price

$20.00, approximately, per 100 cells, f. o. b. New York City; weight, packed, 40 lbs.



Re-assembling (Setting In) Hexagonal Shelving

C. V. HILL & CO., INC.

HILL PRODUCTS DIVISION

TRENTON, N. J.

COLD STORAGE DOORS
MORTUARY REFRIGERATORS

WALK-IN REFRIGERATORS
REFRIGERATED DISPLAY CASES
For Reach-in Refrigerators, see File Index

ICE MAKERS
STORE FIXTURES

COLD STORAGE DOORS OF ALL TYPES

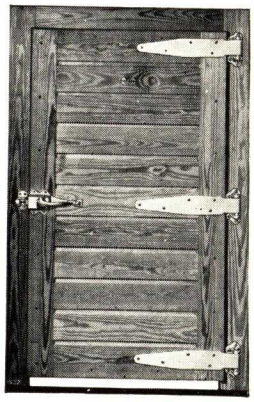
Standard Finish Doors
DeLuxe Finish Doors
Vestibule Doors
Dutch Doors

Doors with Windows
Vertical Sliding Doors
Ice-passing Doors
Keg-passing Doors

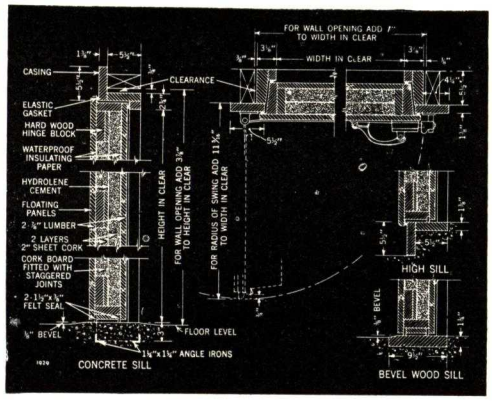
Track Doors
Auto-Close Doors
Double Doors
Metal Clad Doors

Service Doors, solid or with Windows
Brewery Windows
Can and Crate-passing Doors

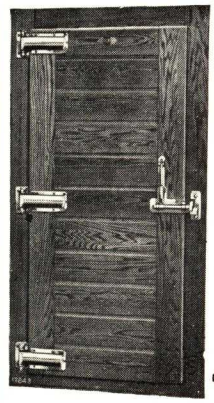
Overlapping Super-Freezer Doors
Complete Refrigerator Fronts (metal or wood)
Mortuary Fronts



Standard Finish



Standard Construction with 4" Insulation



DeLuxe Finish

Entrance Door, with Vestibule

Super-Freezer Door—Over-lapping Type

Standard Track Door

Dutch Door

Standard Door Sizes

When ordering specify whether hinges are to be on right or left, as seen from front.

Inside Dimensions of Frame of Door in clear Width x Height (P) Indicates Popular Sizes	Approx. Shipping Weight* 4" insulated doors	Inside Dimensions of Frame of Door in clear Width x Height (P) Indicates Popular Sizes	Approx. Shipping Weight* 4" insulated doors
1'6" x 1'6"	125 lbs.	2'6" x 6'6"	365 lbs.
(P) 2'6" x 2'0"	155 lbs.	(P) 3'0" x 6'0"	375 lbs.
2'0" x 3'0"	200 lbs.	3'0" x 6'6"	410 lbs.
2'6" x 3'0"	235 lbs.	†3'6" x 6'6"	440 lbs.
2'6" x 3'6"	260 lbs.	(P)†4'0" x 6'6"	475 lbs.
2'0" x 6'0"	305 lbs.	†4'6" x 6'6"	550 lbs.
(P) 2'6" x 6'0"	340 lbs.	‡5'0" x 6'6"	590 lbs.

*Add to weights shown—20% for Sharp Freezer Doors—25% for Metal Clad Doors.

† These doors have three (3) hinges.

‡ These doors have four (4) hinges and double fasteners.

Superior Construction and Performance

Hill Cold Storage Doors are offered as the best cold storage doors that can be built for commercial purposes, and are unconditionally guaranteed to render complete satisfaction. Their construction makes them strong, durable, heat-resistant and trouble-free. Many exclusive features contribute to their superior performance. For instance:

The *famous Hill Floating Panel Front* allows free expansion and contraction of the panels without danger of warping, cracking or buckling.

All lumber is thoroughly kiln dried in our own kilns to prevent warping and cracking in use.

The inside framework is rigid, substantial and securely braced.

The hardware is of special design, heavy and durable, and attached with long screws which seat in either a hardwood backing or a special metal retainer.

All insulation is thoroughly waterproofed.

Air-tight door seals are provided by waterproof, grease-proof elastic gaskets.

Choice of Two Finishes

All Hill Doors can be furnished in either the Hill Standard or the Hill DeLuxe Finish.

Standard Finish includes: Floating Panel Front of selected No. 1 Yellow Pine; casing to match; rear backing of No. 1 Yellow Pine, Fir or Spruce; heavy, Cadmium-plated hardware. (Cadmium is more rust and corrosion resistant than ordinary galvanizing.)

Hill DeLuxe Finish, is so attractive that it distinguishes the entire cold storage installation. The regular DeLuxe Front is furnished with Floating Panel construction in Oak or Ash, the front and casing receiving four coats of finish before shipment. Stainless steel, porcelain, or fine woods also available. The DeLuxe hardware is cast bronze specially designed, modernistic in style, and Chromium-plated.

Insulation

In-fitting Doors can be furnished with the following types of insulation:

Cooler Door construction with 4" granulated cork, encased in waterproof paper.

Freezer Door construction with 4" sheet corkboard, protected with extra heavy waterproof insulating paper and waterproofed with hydrolene, applied cold.

Sharp-Freezer Door construction with 6" highest grade corkboard, protected by extra heavy waterproof insulating paper and waterproofed with hydrolene, applied cold.

Super-Freezer, over-lapping type Doors are furnished with 4", 6" or 8" of sheet corkboard, protected with waterproof paper and sealed dry with hydrolene, applied cold.

Send for Complete Catalog describing the entire line of Hill Doors and including illustrations, detailed drawings, specifications and all other information needed to specify or sell Hill Doors.

JAMISON COLD STORAGE DOOR CO.

Oldest and Largest Manufacturers of Cold Storage Doors in the World

Manufacturers and Distributors—Jamison, Stevenson and Victor Doors

HAGERSTOWN, MD.

SALES BRANCHES AND DISTRIBUTORS (*Carry local stock)

ATLANTA, GA., L. S. Bosarge, 315 Spring St., N. W.
CHICAGO, ILL., Stanley Baldwin, Builders Building
CINCINNATI, OHIO, A. F. Dreyer, 3119 Beaver Ave.
CLEVELAND, OHIO, Fielding-Wales Co., 520 Union Building
DALLAS, TEX., Matthews Engineering Co., 2026 Ross Ave.
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NEW YORK, N. Y., Ira E. McFarland, 274 Madison Ave.
*OMAHA, NEB., Allan Ice Machine Co., 36th and K Sts.
PHILADELPHIA, PA., E. F. Johnson, 220 So. 16th St.
PITTSBURGH, PA., Harry H. Frank, 207 Fulton Building
ST. LOUIS, MO., A. P. Gordon, 7352 LaVeta Ave.
*SALT LAKE CITY, UTAH, L. A. Roser Co., 254 W. 1st, South
*SAN FRANCISCO, CALIF., Phillips Refrig. Products, Inc., 141 Eleventh St.

LICENSED MANUFACTURERS AND DISTRIBUTORS IN CANADA, *Sherer-Gillett Co., Ltd., 116 Adelaide St., W., TORONTO, ONT.

Products

Jamison—Stevenson—Victor Types:

INSULATED DOORS for all purposes of temperature control—three types, with double or single seals of contact, and Extra Heavy Hardware: STANDARD COOLER, FREEZER and SHARP FREEZER DOORS.

VESTIBULE DOORS ("Door that Cannot Stand Open").

AUTO CLOSE DOORS.

SUPER-FREEZER DOORS (overlap type).

TRACK DOORS for overhead rails.

VERTICAL SLIDING DOORS.

AUTOMATIC ICE CHUTES.

CAN and CRATE PASSING VESTIBULES.

REFRIGERATOR FRONTS (wood or metal for built-in refrigerators), DISPLAY WINDOWS.

BREWERY DOORS and WINDOWS.

DUTCH DOORS, KEG-PASSING DOORS.

Any of the above doors can be furnished metal clad for fireproof purposes.

Special Bulletins on any of above products, giving full details, sent on request.

Standard Cooler, Freezer and Sharp Freezer Doors

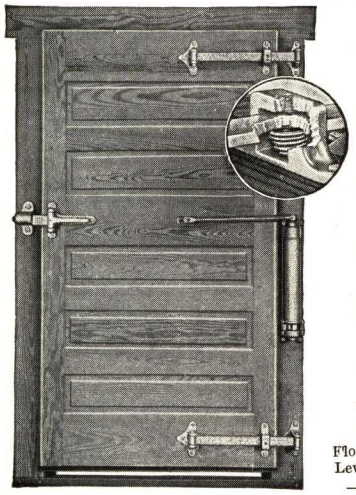


Fig. 1. Jamison Standard Cooler Door—Right Hand, Equipped with Jamison Improved Door Closer

Wall opening for Jamison and Victor Doors must be 7 in. wider and 5 in. higher than door in the clear; for Stevenson Door, 3½ in. wider and higher than door in clear

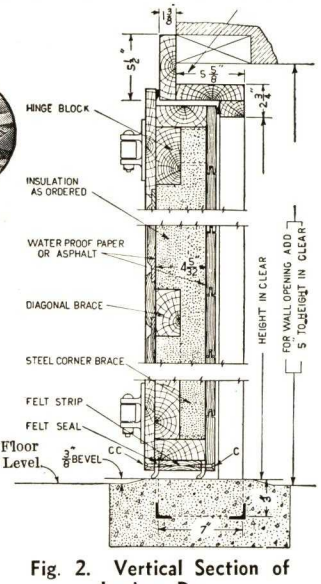


Fig. 2. Vertical Section of Jamison Door

Same for Victor Door, except for hardware. Stevenson Door, single seal and with Stevenson type hardware

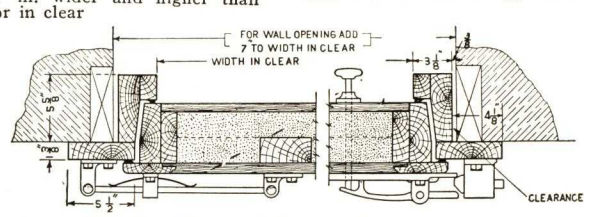


Fig. 3. Horizontal Section of Jamison Door

Victor Door same, except for hardware. Stevenson Door, single seal and with Stevenson type hardware

Standard Door Specifications

We furnish the insulated door hung in the frame, complete with all necessary hardware (galvanized) ready to set in place.

Front—No. 1 yellow pine, raised panel construction.

Back—Best grades of fir or pine, at manufacturer's option, with extra long tongue and groove to allow for contraction.

Construction—Side stiffeners built up of two timbers securely fastened together. Diagonal brace laid flat against front panel supplemented by steel angle corner braces. The whole securely lagged and screwed together forming a solid operating unit.

Insulation—Cooler, 4-in. granulated cork encased in waterproof insulating paper. Freezer and Sharp Freezer, 4, 6 or 8 in. corkboard laid in hot asphalt. Other insulation as ordered.

Sills—Three standard types—see Figs. 4, 5 and 6.

Seal—On Jamison and Victor types, two. On Stevenson, one. Special Jamison resilient pure rubber gasket. See next page.

Fittings—The primary difference between Jamison, Stevenson and Victor Doors (with exception of single seal on Stevenson Door) is in the hardware furnished:

For Jamison Doors—Jamison Wedgetight (patented) Fastener and Jamison Improved Adjustable Spring Hinge, with conical spring.

For Stevenson Doors—Improved No. 31 Roller Fastener and Stevenson Flexible Hinge and Hinge Guard.

For Victor Doors—Victor No. 200 Fastener and Victor Hinge.

Sills

Three standard types of sills are applicable to all Jamison, Stevenson or Victor Doors. These three types will meet practically every need.

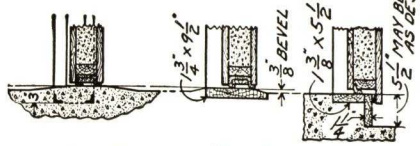


Fig. 4 Arrangement of angles for concrete sill

Fig. 5 Beveled wood sill

Fig. 6 High sill

Standard Sizes; Cooler, Freezer and Sharp Freezer Doors

We usually have in stock the following sizes for immediate shipment. In ordering or specifying be sure to state whether Stevenson, Jamison or Victor is wanted, and whether Cooler, Freezer or Sharp Freezer (see Insulation above). Be sure to state which sill is wanted and whether right or left-hand door. Fig. 1 illustrates a right-hand door—the standard designation in the cold storage industry. Left-hand door would have hinges on left-hand side. We are prepared to furnish doors of any size, design or specification required.

Stock No.	Dimensions inside of frame		*Ship. wt. crated, lbs.	Size of wall opening			
				Jamison and Victor		Stevenson	
	Width ft. in.	Height ft. in.		Width ft. in.	Height ft. in.	Width ft. in.	Height ft. in.
000	1 6	1 6	125	2 1	1 11	1 9½	1 9½
00	2 6	2 0	155	3 1	2 5	2 9½	2 3½
0	2 0	3 0	200	2 7	3 5	2 3½	3 3½
03	2 6	3 0	235	3 1	3 5	2 9½	3 3½
02	2 6	3 6	260	3 1	3 11	2 9½	3 9½
1	2 0	6 0	305	2 7	6 5	2 3½	6 3½
2	2 6	6 0	340	3 1	6 5	2 9½	6 3½
3	2 6	6 6	365	3 1	6 11	2 9½	6 9½
4	3 0	6 0	375	3 7	6 5	3 3½	6 3½
5	3 0	6 6	410	3 7	6 11	3 3½	6 9½
7	3 6	6 6	440	4 1	6 11	†3 9½	6 9½
11	4 0	6 6	475	4 7	6 11	†4 3½	6 9½
13	4 6	6 6	550	†5 1	6 11	†4 9½	6 9½
16	5 0	6 6	590	†5 7	6 11	†5 3½	6 9½

*Shipping weight shown for 4-in. insulation. For 6-in. insulation add 20% to these figures. †These doors have extra hinges.

Any of the above can be furnished metal clad for fireproofing. Adds 25% to shipping weight.

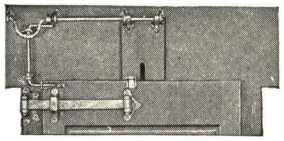


Fig. 7. Showing Jamison Automatic Trap Lift Device

Track Doors

All Jamison, Stevenson and Victor Doors can be furnished with track ports and the automatic port-operating devices. Fig. 7 shows the Jamison Automatic Trap Lift Device. Track port opens and closes with positive motion simultaneously with insulated door through a simple system of levers. No springs or delicate mechanism. Wall opening must be 8 in. higher than top of rail.

Refrigerator Fronts—Wood or Metal-Covered

For temperature control at openings, combined with unusually high standards of appearance and sanitation—as in kitchens and laboratories of hospitals, refrigerator fronts in stores and institutions, battery fronts for morgues, etc. Paneled wood fronts, or insulated metal-covered fronts and doors of galvanized, Monel Metal, chrome nickel steel, or with porcelain fronts and backs. Operating convenience, efficiency and long life characterize this equipment. Hardware is of fitting character—bronze, nickel or chromium to match.

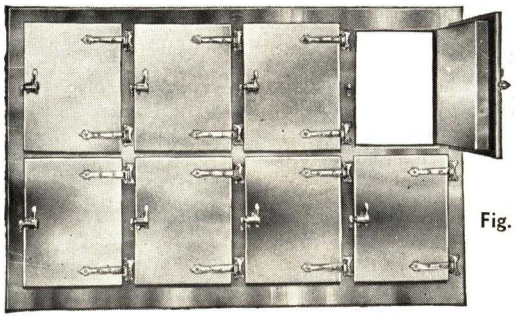


Fig. 8

All of this special equipment is built specifically to meet the temperature requirements of its particular job. We invite your inquiries.

Stevenson Super-Freezer Door (Overlap Type)

For near-zero and sub-zero temperatures—in ice cream hardening rooms, holding chambers for quick frozen foods, etc. Flat fitting against the casing and sealed by Jamison "SF" gasket, a wide, resilient, pure rubber pad.

Door is furnished with casing but without jambs, complete with all necessary hardware, and is designed to be fitted to the insulated side of the wall, swinging into the cold room. Back of door is metal covered. Insulated with 4, 6 or 8 in. of corkboard laid in hot asphalt.

Special Roller Fastener and Spring Hinge assure tight sealing at all points.

Fig. 9. Stevenson Super-Freezer Door

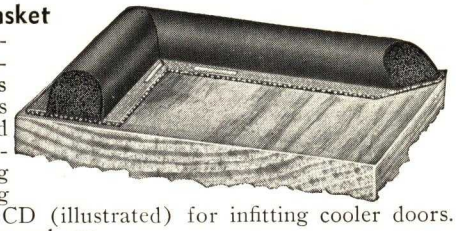
Standard Sizes of Stevenson Super-Freezer Doors

Be sure to state type of sill, thickness of insulation, and whether right or left-hand door is wanted. While the doors below are standard sizes, we are prepared to furnish doors of any size, design or specification required.

Stock No.	Size of door in clear		Wall opening	*Ship. wt. (crated) 4-in. insulation, lbs.	Notes
	Width ft. in.	Height ft. in.			
78	1 6	1 6	Same as door in clear	230	Unless otherwise instructed, we furnish 20-gauge galvanized sheets on back of door.
80	2 0	3 0		335	
81	2 0	6 0		500	
82	2 6	6 0		555	
83	3 0	6 0		610	
†79	3 6	6 6		720	
†86	4 0	6 6		790	

*Add to weights shown—15% for 6-in. insulation—30% for 8-in. insulation—10% for metal-clad doors.
†These doors have three hinges.

Jamison "CD" Gasket



Resilient, live-rubber of cellular construction remains pliable ten times longer than old types. Gives an airtight, conforming seal. No "pinching up" needed. Type CD (illustrated) for infitting cooler doors. SF for Super-Freezer doors.

Standard Vestibule Door

Familiarly known as the Stevenson "Door that Cannot Stand Open," is now a consolidation, in one unit, of the best features of former Jamison, Stevenson and Victor types. A necessity at every busy doorway. The Auto Close Doors, operating in the Jamison gravity cam mechanism at the top of each swinging door, remain in closed position, except when the opening is actually being used for passage by men or trucks, and return by gravity quickly to closed position. This instant closing effectively retards escape of refrigeration and prevents in-currents of warm, moist air. By bumping against the unlatching bar attached to the large cold storage door, the Auto Close Doors act to automatically throw open the outer door, speeding up traffic. The large cold storage door is built to standard Stevenson specifications (see preceding page). With standard hardware applied to the insulated door.

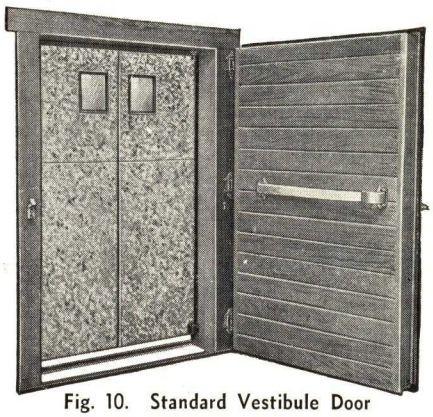


Fig. 10. Standard Vestibule Door

The Auto Close Doors are completely metal clad, being armored to a height of 48 in. with 16-gauge galvanized steel to withstand hard knocks by trucks. All Auto Close Doors have peep holes for traffic observation.

Super-Freezer Doors and Track Doors can be furnished with these Auto Close Doors forming Vestibule units.

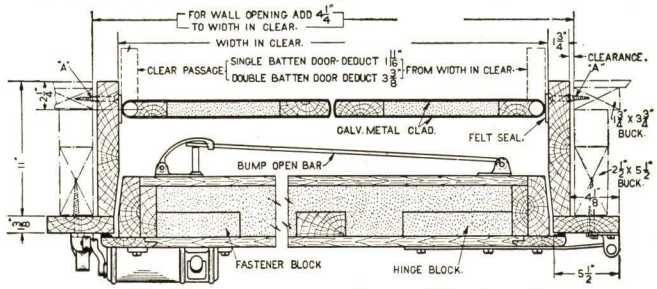


Fig. 11. Horizontal Section, Standard Vestibule Door

Standard Vestibule Door Sizes

Be sure to specify thickness of insulation, kind of sill and whether door is to be right or left hand. We are prepared to furnish cold storage doors of any size, design or specification in connection with the Auto Close Doors to form vestibule units. Jamison or Victor Hardware furnished on main cold storage door, when specified, to match existing installations.

Stock No.	Size of door in clear		Wall opening		†Ship. wt. (crated) 4-in. insulation, lbs.	Number of hinges
	Width ft. in.	Height ft. in.	Width ft. in.	Height ft. in.		
56	3 6	3 0	3 10¼	3 4½	460	2
*64	2 6	6 0	2 10¼	6 4½	530	2
66	3 0	6 0	3 4¼	6 4½	625	2
69	3 6	6 6	3 10¼	6 10½	750	3
71	4 0	6 6	4 4¼	6 10½	805	3
72	4 6	6 6	4 10¼	6 10½	885	3
73	5 0	6 6	5 4¼	6 10½	960	4

*Single Auto Close Door—all other sizes listed have Double Auto Close Doors.
All Auto Close Doors provided with peep holes; when opened at right angles, each Auto Close Door reduces clear opening 1 1/16 in.
†Add 10% to weights shown for 6-in. insulation; 20% for metal-clad doors.

Doors for Brewery use. Write for Bulletin 112.

1888

D. A. MATOT

1938

Manufacturers of Refrigerators, Cold Storage Doors and Fronts, Galvanized Steel Shelving and Meat Rails

1544 West Montana Street, CHICAGO, ILL.

For Matot Dumb Waiters, see File Index

Standard Type Cold Storage Door

Insulation—Granulated cork, Palco wool, or corkboard in any thickness from 3 to 8 in.

Exterior—Five raised panel type constructed of pine, manufactured to allow for expansion and contraction of lumber. 1¼-in. overlapping type.

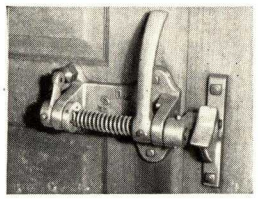
Interior—V-joint tongued and grooved, kiln-dried fir lumber.

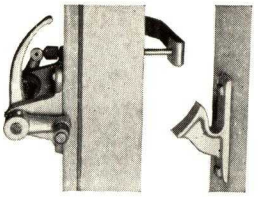
Frames and Jambs—Clear kiln-dried high grade Oregon spruce.

General Construction—Door rigidly cross braced and reinforced with galvanized corner angles.

Hardware—Heavy ½ x 2-in. steel bar strap hinges, hot galvanized. Extremely heavy self-sealing spring latch with inside releaser and outside handle at extreme edge of door, giving operator greatest possible leverage. Springs made of phosphor bronze spring wire, highly resistant to corrosion and wear. Spring has adjusting collar to adjust tension without use of tools. All hardware fastened with galvanized bolts and lag screws.

All Matot Doors, whether Standard Type or Special, are equipped with two gaskets to form a seal at two points.



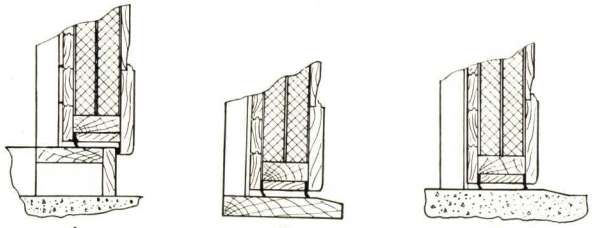


Hardware

Standard Type Door

Special Doors and Fronts

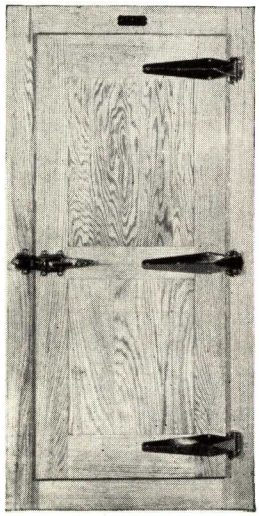
We make a specialty of manufacturing special doors and fronts, constructed according to specifications, of any special lumber, i. e.: birch, oak, ash, mahogany, walnut, etc., or metal, either on front or back, or completely clad doors and frames of stainless steel, monel, porcelain, galvanized, etc. Special fronts can be made in any combination of doors, drawers and display windows desired. Inner gasket strip is adjustable to allow for proper contact after door has been set. Gasket used is special greaseproof synthetic rubber coated. Any entrance door can be furnished with either type sill as shown in illustration A, B or C. All doors and fronts are made and completely hung in factory and shipped ready to be set in buck opening. All doors made in standard or special sizes.



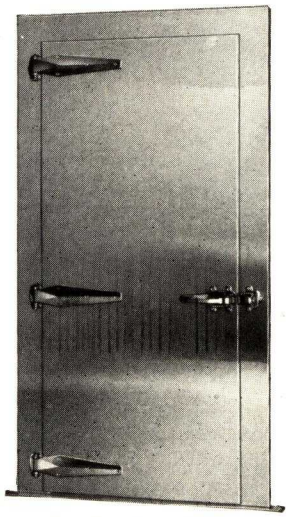
A B C

Types of Sills

For width of buck opening add 7 in. to clear door opening desired. Doors made in three sill types: Type A where refrigerator floor is higher than building floor; Type B beveled hardwood sill; Type C where building floor is the same level as refrigerator floor. For height of buck opening add to clear door opening desired 11 in. for Type A; 6 in. for Type B; 4 in. for Type C.



Special Front and Door



Stainless Steel Door

Matot Galvanized Steel Slatted Shelving

Shelving is made up of heavy 1-in. steel bands riveted to 1½ x 1½-in. angle frame, all hot galvanized after fabrication. Standard widths range from 16 to 18 in. but can be made in any width specified.

Shelves are supported on 1 5/16-in. o.d. high carbon steel tubing, having a wall thickness of .102. Shelf brackets are adjustable, are of very simple construction, and rigidly hold the entire assembly together. Brackets are heavy malleable castings, also hot galvanized. Our method of simple and rigid construction of shelf does not require the use of corner brackets, which also helps to reduce the weight of each shelf. Shelf standards are equipped with malleable iron foot flange and acorn top.

Steel Slatted Shelves

Meat Rails

Meat Rails are of ⅜ x 2-in. band iron, hot galvanized. Brackets are of galvanized malleable iron, in lengths of 1, 4, 6 and 10 in., all adjustable. Pipe supports are of 1 5/16-in. o.d., with galvanized malleable foot and ceiling flange, and equipped with adjustable coupling for variation in height.

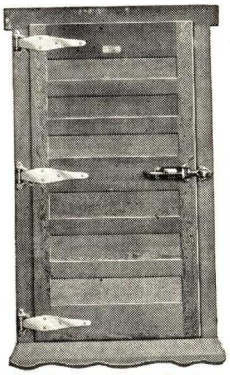
YORK REFRIGERATION ACCESSORIES DIVISION

YORK ICE MACHINERY CORPORATION
GENERAL OFFICES
YORK, PA.
DIRECT FACTORY BRANCHES IN 70 UNITED STATES CITIES
For Refrigeration and Air Conditioning, see File Index

All Types of Cold Storage Doors, Windows and Refrigerator Fronts

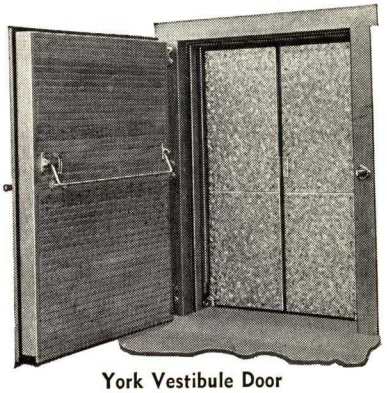
The satisfaction obtained in the operation of any Cold Storage Room is dependent, in a large measure, upon the efficiency and service of its doors. A Cold Storage Door must incorporate features and balance that offer a quick and easy means of access to rooms. It must be ruggedly built to withstand the wearing effect of operation—insulated efficiently and thoroughly to prevent infiltration of warm air.

Cold Storage Doors should be selected for the service they will give over a period of years. The internal construction, strength and insulation are points of first consideration.



York Standard Cooler, Freezer, or Sharp Freezer Door

York Track Door



York Vestibule Door

York Standard Door Specifications

Lumber — Kiln dried and air seasoned old growth Douglas Fir throughout.

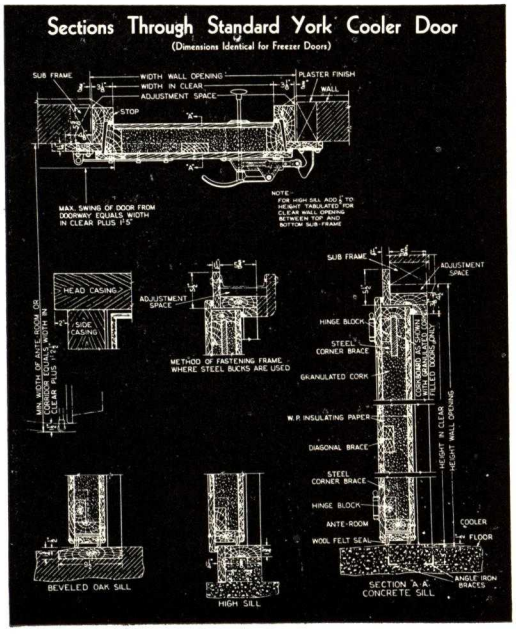
Braces—Steel angle braces in all four (4) corners. 2x4-in. wood wedged between diagonally opposite corners.

Insulation — Regranulated cork or corkboard laid in hot asphalt (other approved insulating materials available on specification).

Gaskets — Resilient sponge rubber core with wear and grease resisting cover. Sill gasket on concrete and oak sill type doors, rubber-shod felt.

Hardware—Self-adjusting type. Malleable iron castings, sandblasted and cadmium plated.

To harmonize with the general surroundings or to fulfill a specific condition, specifications may be revised to suit requirements—special woods may be substituted for the standard fir—doors may be covered with sheet metal (galvanized steel, stainless steel, etc.). For installations requiring hardware of an attractive and lasting finish YORK STAINLESS hardware is especially recommended.



The castings in this hardware are copper nickel alloy—other parts are of stainless steel. The finish is a natural soft satin. There is no plating to peel or wear through.

While all of them cannot be illustrated here, the York line of doors also includes—

Double Doors	Conveyor Doors
Dutch Doors	Ice Passing Doors
Auto-close Doors	Ice Chutes
Can and Crate Passing Doors	Vestibule Track Doors
Ice Cream Can Passing Vestibules	Super Freezer Vestibule Doors

York Standard Door Sizes Clear Width and Height

1'6" x 1'6"	2'6" x 2'0"	2'6" x 6'6"	4'0" x 6'6"
2'0" x 2'6"	2'6" x 3'0"	3'0" x 6'0"	4'6" x 6'6"
2'0" x 3'0"	2'6" x 3'6"	3'0" x 6'6"	5'0" x 6'6"
2'0" x 6'0"	2'6" x 6'0"	3'6" x 6'6"	

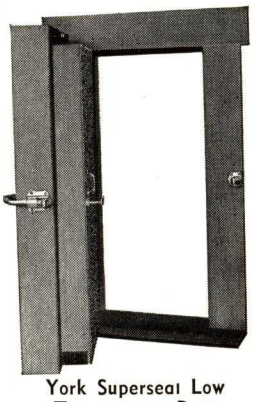
To determine wall openings for cooler or freezer doors add to clear opening:

Height from floor line to top buck on concrete or oak sill doors.....5"

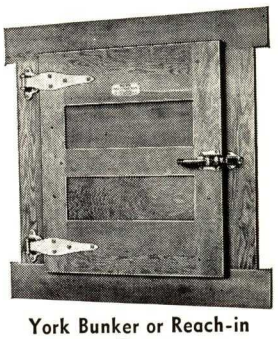
Height between bottom and top buck on high sill doors .....5½"

Width between bucks, concrete, oak or high sill doors .....7"

If Your Files Do Not Contain a Copy of The York Cold Storage Door Manual for Architects and Engineers, please write for a copy.



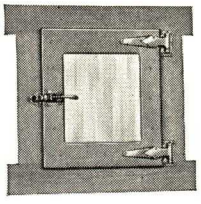
York Superseal Low Temperature Door

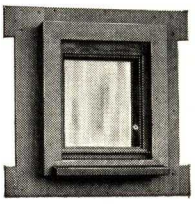


York Bunker or Reach-in Door

York Super-Freezer Door

York Vertical Sliding Door





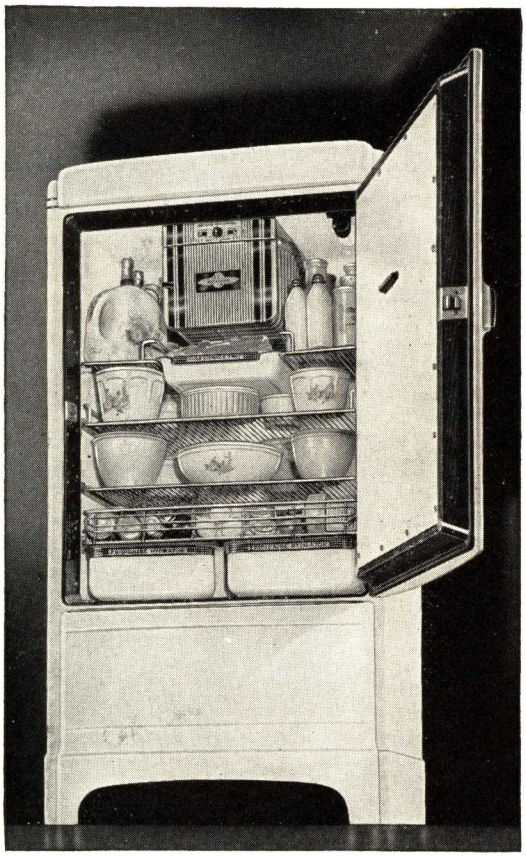
York Cold Storage Windows Showing Front and Rear Construction.

FRIGIDAIRE DIVISION

GENERAL MOTORS SALES CORPORATION

DAYTON, OHIO

Electric Refrigerators for Homes and Apartments—Electric Ranges—Electric Water Heaters—Commercial Refrigeration Equipment for Every Need



1938 FRIGIDAIRE WITH THE NEW SILENT METER-MISER FOR HOMES AND APARTMENTS

There are Frigidaire Electric Refrigerators to meet every kitchen requirement in small homes, and apartment dwellings. Fifteen different models are available, ranging in size from a big 2-door 13.1 cu. ft. capacity down to 3.1 cu. ft. capacity. The latter being especially designed for small kitchens, can be installed under the sink, or if desired, supplied with a flat work-table top, sink high.

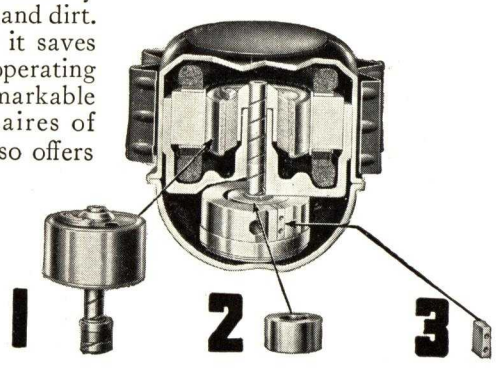
Found in the complete line are these outstanding Frigidaire advantages. The New Silent Meter-Miser . . . fast freezing "Double-Easy" Quickube Tray . . . New Moisture-Seal Hydrators . . . Food-Safety indicator, and many other genuinely worthwhile features. All Frigidaires carry a 5 year protection plan—backed by General Motors. They offer lower operating cost, safer food protection, greater ice-ability, and all 'round convenience.

The cabinets are wide and roomy with considerably more shelf space in the front where it is easy to use. Exteriors are finished in either Lifetime Porcelain or Durable Dulux, and stainless porcelain is used in the bottom section of the interiors. Close-bar shelves prevent tipping or spilling of cups, glasses or small food containers.

When you specify or recommend Frigidaire you can be sure your client will receive the most economical, dependable, and complete refrigeration service available.

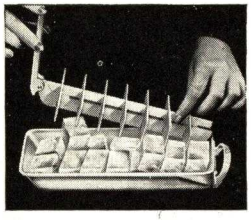
EVERY FRIGIDAIRE HAS THE NEW SILENT METER-MISER—ONLY 3 MOVING PARTS, INCLUDING THE MOTOR

The New Silent Meter-Miser has only 3 moving parts including the motor. Simplest refrigerating mechanism ever built! It is *built* silent to *stay* silent. Automatically oiled and permanently sealed against moisture and dirt. Actual tests show that it saves up to 25% more on operating cost than even the remarkable current-saving Frigidaires of 1937. In addition, it also offers substantial savings on the cost of proper food preservation . . . the cost of fast ice-freezing . . . and it runs quiet, trouble-free year after year.



1. Motor Rotor and Compressor Eccentric
2. Compressor Impeller
3. Compressor Divider Block

EVERY TRAY IN EVERY MODEL IS A "DOUBLE-EASY" QUICKUBE TRAY



A touch of the finger on Frigidaire's Automatic Tray Release instantly loosens tray from freezer, no matter how tightly frozen. A flip of the lever releases the ice-cubes, two at a time or a whole trayful. Big, dry-cold cubes. Tray yields 20% more ice by ending faucet waste. Quickube Trays are *All-Metal* for faster freezing.

ONLY FRIGIDAIRE OFFERS ALL THESE ADVANTAGES

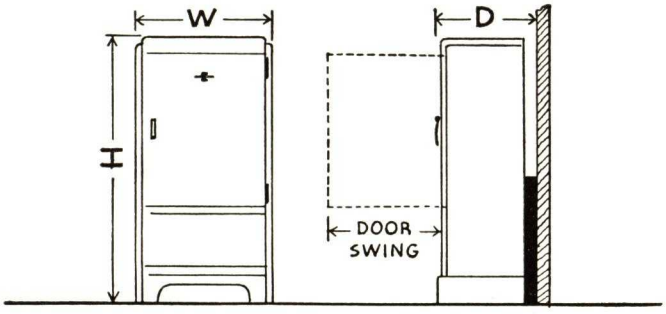
THERMO-SEALED CABINETS MORE AND BETTER INSULATION

Frigidaire cabinets are of all-steel construction, Thermo-Sealed. There are no wood frames even in door or door openings. No possibility of warping or deterioration. Completely insulated "Torque-Tube" door construction for extra strength and rigidity.

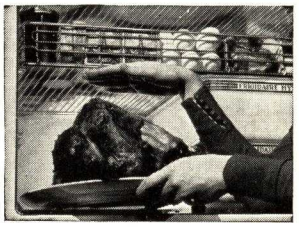
The 1938 Frigidaire cabinets also have improved insulation throughout, 18% more efficient. Higher resistance keeps *more* cold in and *more* heat out. Extra insulation where it is needed most, in doors and tops and bottoms of cabinets.

In addition, heat-laden refrigerant flows through Frigidaire's new "Cold-Speeder" Condenser much faster than in ordinary condensers. Also, its direct-flow design brings the refrigerant in close contact with every square inch of cooling surface. Thus cooling is accomplished more rapidly and efficiently.

For any additional information you desire, see your nearest Frigidaire dealer, or write Architects Service Department, Frigidaire Division, General Motors Sales Corporation, Dayton, Ohio.

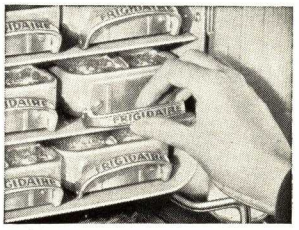


Moisture-Seal Hydrators



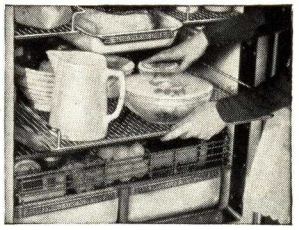
9-Way Adjustable Interior

2-Way Cold Storage Tray

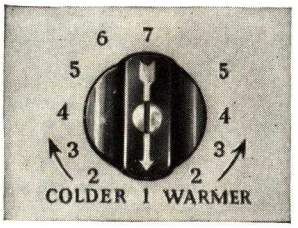


Automatic Ice Tray Release

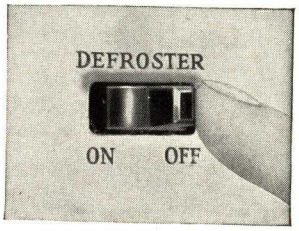
Food-Safety Indicator



Close-bar Sliding Shelves



Double-Range Cold Control



Automatic Reset Defroster

SPECIFICATIONS OF FRIGIDAIRE MODELS

Model	Exterior Finish (Note 1)	Number Doors	Motor H. P.	"Double-Easy" QUICKUBE Trays	Total Cubes	Total Pounds Ice	Food Storage		Dimensions (Inches)			
							Cu. Ft. (Nema)	Sq. Ft. (Nema)	W	D (Note 2)	H	D. S. (Door Swing)
Imperial	Porcelain	2	1/6	8	144	19	13.1	27.1	38 1/8	31 7/8	64 3/4*	17 13/16
DE LUXE												
8-38	Porcelain	1	1/7	6	108	14	8.25	19.4	32 1/4	28 5/8	60 3/16	30 1/4
7-38	Porcelain	1	1/7	6	84	12	7.2	16.0	31 1/8	25 3/16	59 3/16	29
6-38	Porcelain	1	1/11	6	84	10	6.1	14.2	29 11/16	25 1/4	58 3/16	27 1/4
5-38	Porcelain	1	1/11	4	64	8	5.1	10.7	28 1/16	25 1/8	54 9/16	25 5/8
MASTER												
8-38	Dulux	1	1/7	6	108	14	8.25	19.4	32 1/4	28 5/8	60 3/16	30 1/4
7-38	Dulux	1	1/7	6	84	12	7.2	16.0	31 1/8	25 3/16	59 3/16	29
6-38	Dulux	1	1/11	6	84	10	6.1	14.2	29 11/16	25 1/4	58 3/16	27 1/4
5-38	Dulux	1	1/11	4	64	8	5.1	10.9	28 1/16	25 1/8	54 9/16	25 5/8
4-38	Dulux	1	1/16	2	32	4	4.1	9.0	24 3/16	25 1/8	50 3/16	21 13/16
SPECIAL												
DRS 7-38	Dulux	1	1/11	6	84	10	7.2	15.8	31 1/2	25 3/8	57 15/16	29 11/16
DRS 6-38	Dulux	1	1/11	4	56	8	6.1	14.1	30 1/16	24 5/16	56 15/16	28 1/4
DRS 5-38	Dulux	1	1/11	3	48	6	5.1	10.9	28 3/8	24 5/16	53 3/8	26 5/8
D-3	Dulux	1	1/12	2	32	4	3.1	6.9	22 5/8	23 9/16	44 5/16	20 7/16
**TD-3	Dulux	1	1/12	2	32	4	3.1	6.9	23 5/16	23 9/16	35 3/4	20 7/16

Note 1: All models have Porcelain-on-Steel interiors, with stainless porcelain in bottom where stains are most likely to occur.
Note 2: Includes door, hardware and space at rear for ventilation.
*67 inches with casters.
**The TD-3 has stainless Porcelain-on-Steel table top with rolled edges. Short legs permit it to be placed under kitchen sink.

ADDITIONAL FEATURES

- Automatic Interior Light.
- Tall Bottle Space.
- Stainless Porcelain in Food Compartment.
- Super Freezer.
- 2-Way Frozen Storage Compartment.
- 3-Way Sliding Shelf.
- 2-Way Multi-Storage Section.
- Wider, Roomier Cabinets.
- Portable Utility Shelf.
- Touch-Latch Door Opener.
- Air-Cushion Door Seal.
- Torque-Tube Door Construction.
- F-114, Low-Pressure Refrigerant.
- Silent Sentinel.

NEW FRIGIDAIRE ELECTRIC RANGES

Frigidaire Electric Ranges were designed to unite in a single range the greatest number of advanced cooking and baking advantages possible. Accordingly they are outstanding in performance — both in cooking results and economy of operation. Model for model, they offer more cooking and baking advantages than any other make. They put the many advantages of clean, cool, tastier electric cookery within the reach of more homes and apartments than ever before.

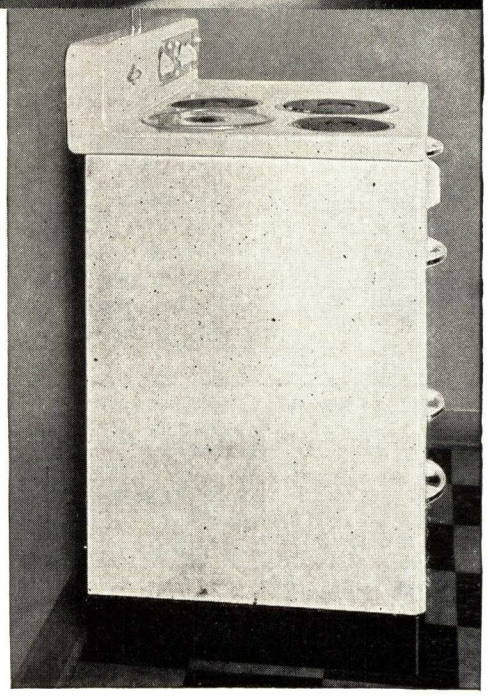
Beautifully-styled, finished in gleaming porcelain inside and out, Frigidaire Electric Ranges are available in a full line of models, both base and leg design. Illustrated on this page is the Model B-60, a deluxe range complete in every detail with no "extras" to buy. All bear the approval of the National Board of Fire Underwriters.

FRIGIDAIRE EXCLUSIVE DESIGN CHROMALOX "SPEED-HEAT" UNITS

Every cooking unit on every model is fully enclosed, has 3 cooking speeds, and gives fast intense heat. Exclusive "Low-Low" feature maintains boiling on ⅓ less current than conventional type units. All units have substantial heat storage providing "free-heat" for finishing cooking operations.

FRIGIDAIRE "EVEN-HEAT" OVEN WITH THE NEW SMOKELESS BROILER

A full size oven, that preheats to 400 degrees in 10 minutes. Has new type "Even-izer" heat distributor with exclusive center vent assuring uniform heat throughout. Has 1-Piece porcelain finished oven liner with rounded corners front and rear, embossed oven guides and non-tilt, lock-type shelves. Counterbalanced oven door opens downward. Special design broiler eliminates objectionable odors and smoking, has porcelain finished pan for easy cleaning.



MODERN KITCHEN STYLING

All Frigidaire Electric Range models are built to accepted kitchen dimensions. Top fits flush against wall. Sides are smooth with rounded corners — fit snugly alongside other cabinets. Recessed toe plate on base models to provide ample toe room—is instantly removable without the use of tools. Snaps into place.

NEW FRIGIDAIRE ELECTRIC RANGES

Model L-20

Model B-20

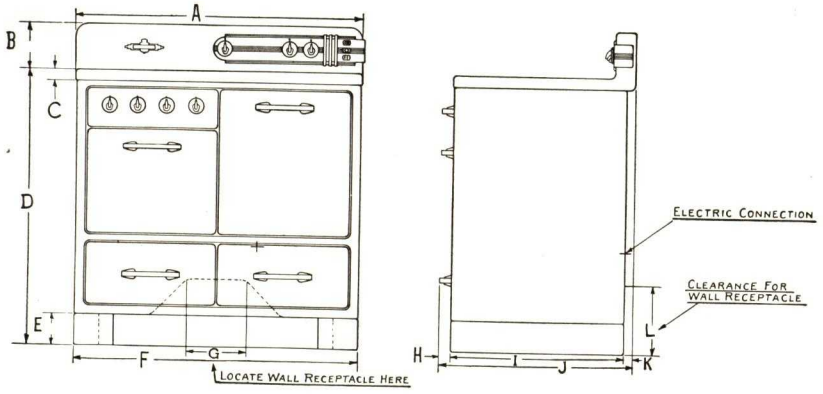
Model L-40

Model B-40

FIRST RANGE Ever Designed to Unite All These Important Advantages — in every model — in every price class!

All Porcelain Cabinet—inside and out
Enclosed 3-Heat Cooking Units
Current-Saving "Low-Low" Heat
Silver Contact Switches
Seamless Porcelain Lined Oven
Non-Tilt Sliding Oven Shelves
Smokeless Broiler
Hydraulic Oven Heat Control
Utensil Storage Drawers
Armored Wiring

Plus All These Features which are either standard equipment or optional in most models. "Cook-Master" Electric Time Control "Time-Signal"... "Thermizer" Cooker... Cooking Top Lamp... Condiment Set... Front-Opening Oven Vent... Warming Drawer... Flush wall construction.



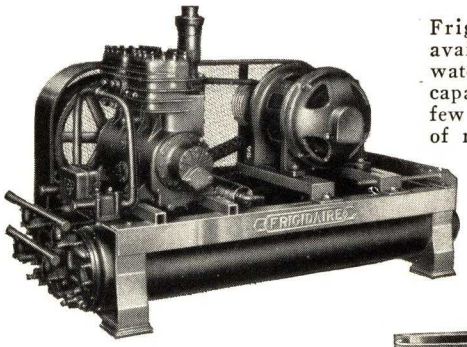
NEW FRIGIDAIRE AUTOMATIC ELECTRIC WATER HEATERS

Specifications and complete details of the new Frigidaire automatic electric water heaters are not available as this goes to press. Complete information, with illustration and detailed specifications will be sent upon request. Address Frigidaire Division, General Motors Sales Corporation, Dayton, Ohio.

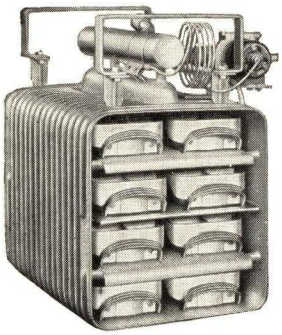
DIMENSIONS

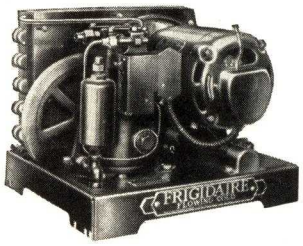
MODEL	A	B	C	D	E	F	G	H	I	J	K	L
L-20	38″	5″	1½″	36″	12⅞″	37¾″	—	1½″	23″	25⅜″	⅞″	—
B-20	38″	5″	1½″	36″	4″	37¾″	8″	1½″	23″	25⅜″	⅞″	8⅞″
L-40	38″	6″	1½″	36″	12⅞″	37¾″	—	1½″	23″	25¾″	1¼″	—
B-40	38″	6″	1½″	36″	4″	37¾″	8″	1½″	23″	25¾″	1¼″	8⅞″
B-60	38″	6″	1½″	36″	4″	37¾″	8″	1½″	23″	25¾″	1¼″	8⅞″

THERE IS FRIGIDAIRE EQUIPMENT FOR EVERY COMMERCIAL AND INDUSTRIAL REFRIGERATION NEED

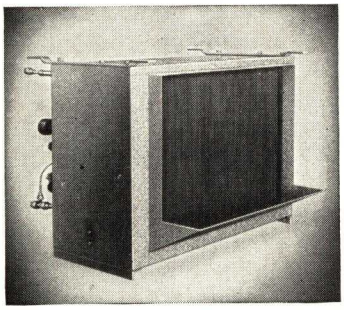


Frigidaire compressors, available in either air or water cooled models, have capacities ranging from a few pounds to many tons of refrigeration per day.

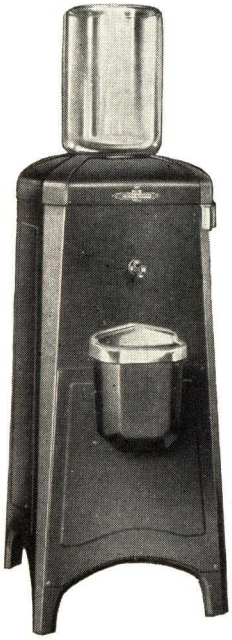


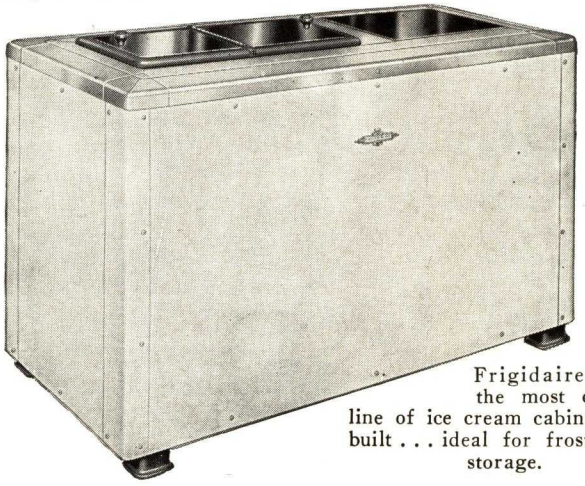


Typical Frigidaire ice making coil which is provided with automatic tray release.



Frigidaire Evaporative Condensers are designed for use in areas where condensing water supply is costly or uncertain.





Frigidaire offers the most complete line of ice cream cabinets ever built . . . ideal for frosted food storage.

Frigidaire equipment has high capacity and extreme flexibility. It includes types for all food preservation — storage, wholesale and retail . . . water cooling . . . milk cooling . . . beverage cooling . . . ice cream storage . . . frozen foods . . . locker storage.

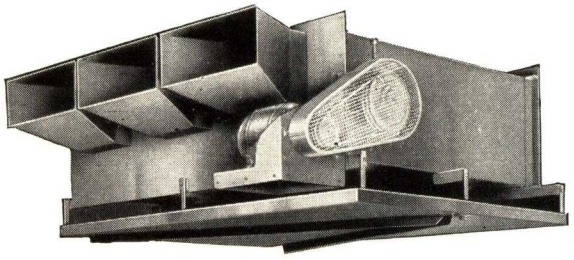
Frigidaire dealers offer you the assistance of experienced, highly trained consultants for all refrigeration problems. There is no cost or obligation for this service. Just call your nearest Frigidaire Commercial dealer or write for complete details and literature on any type of installation.

You can specify Frigidaire with complete assurance of over-all economy, outstanding performance, and years of dependable service.

FRIGIDAIRE
MADE ONLY BY GENERAL MOTORS

FRIGIDAIRE DIVISION
GENERAL MOTORS SALES CORPORATION
DAYTON, OHIO

There is Frigidaire water cooling equipment for every commercial, industrial and home need.



Frigidaire offers a complete line of high capacity Forced Air Cooling Units for storage room installations such as fruit and vegetable storages, dairies, packing plants, etc.

SECTION 28

CONTINUED ⟶

GENERAL ELECTRIC COMPANY

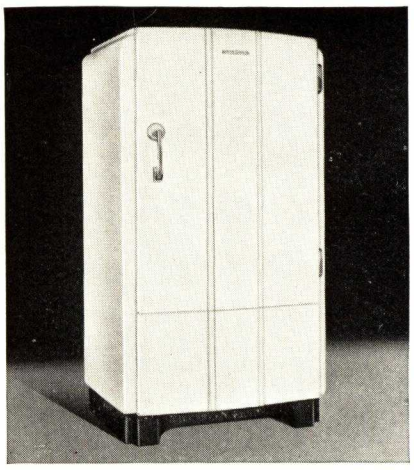
Nela Park
CLEVELAND, OHIO

GENERAL ELECTRIC

REFRIGERATORS

For eleven years (longer than any other manufacturer) General Electric has been producing sealed refrigerating mechanisms. Over this period, constant improvements and mechanical refinements which can come only from years of actual field experience have been made on the G-E mechanism.

Probably the most important of all recent advancements in household refrigeration is General Electric's oil cooling and forced feed lubrication—an ingenious system whereby the permanent supply of oil is utilized not only for *pressured* lubrication to every moving part, but for cooling the motor as well. This and other developments have contributed to the now famous economical operation and long life of General Electric Triple Thrift refrigerators.



Within the cabinet of the Triple Thrift refrigerator there is a host of *usable* convenience features. The new Quick tray is fast, convenient, and economical. Sliding shelves (even the top shelf slides), fruit and vegetable drawers, removable part shelf, and a score of other features all contribute to complete refrigeration enjoyment.

The modern lines and stately appearance of the 1938 refrigerator were designed for *lasting beauty*. Nor is this beauty only skin deep. In the fabrication of the cabinet is all-steel construction, thermocraft insulation (held in highest regard by refrigeration engineers) and textolite door strips which will not warp, crack, nor absorb food odors.

GENERAL ELECTRIC RANGES AND WATER HEATERS

Ranges

Almost two million women now enjoy the speed, cleanliness, economy, and finer flavor made possible by electric cookery. To them hot, humid kitchens are a thing of the past; sooty pots and pans, grimy walls and curtains are history. Hi-Speed Calrod, with which all General Electric ranges are equipped, brings new economy and speed to electric cookery.

The exclusive G-E Tripl-Oven which is really three ovens in one, affords much greater capacity than ordinary ovens, saves both money and time on single shelf cooking.

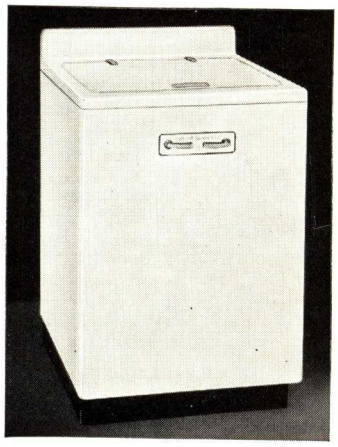
A wide variety of convenience features make the G-E range an asset in any kitchen, allows maximum flexibility in kitchen planning, takes much of the work out of woman's workshop. All G-E ranges are table-top design, constructed to coordinate with other General Electric kitchen appliances to form a harmonious whole when grouped in an all-electric kitchen. There is a full line of models from which to choose, and a wide range of prices.

All General Electric ranges bear the approval of the National Board of Fire Underwriters. All electrical parts are completely enclosed.

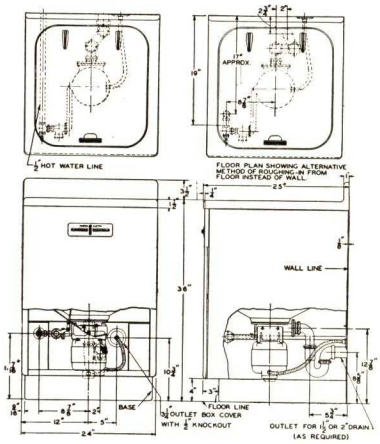
Water Heaters

General Electric automatic electric water-heaters mean plenty of hot water in the home, conveniently, safely, reliably, economically. Modern styling permits their installation in the kitchen, basement or bathroom. Table-top models for the kitchen. All G-E water heaters use the famous Calrod unit. Both galvanized and monel tanks, a variety of capacities.

GENERAL ELECTRIC DISHWASHER

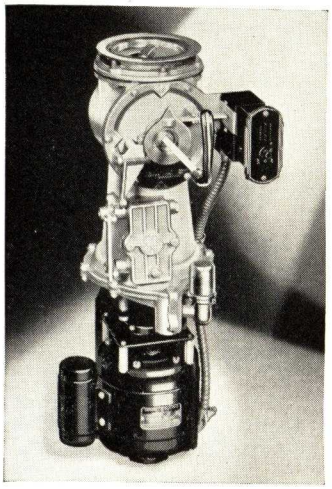


The G-E Dishwasher banishes the hated task of washing dishes by hand. Dishes, glasses, cups and silverware can all be washed at one time. All models are the same in quality, capacity and efficiency. The FE-15, illustrated, is a free standing cabinet model finished in white Glyptal-baked enamel with acid-resistant porcelain enamel cover. The M-15 with monel metal cover, and the R-15 with cover of stainless steel are made to be incorporated in other manufacturers' sinks—the KE-15 is incorporated in the G-E Electric Sink, the unit kitchen or locally built-in installations.

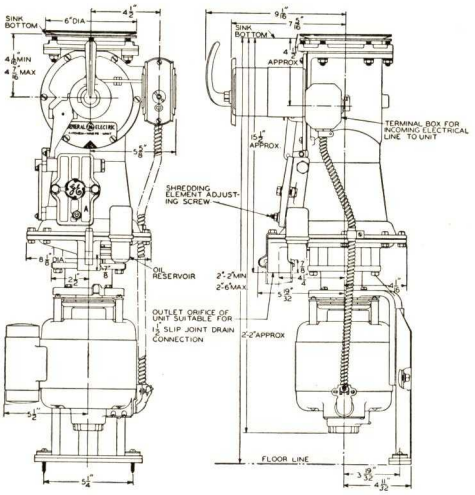


plus

GENERAL ELECTRIC DISPOSALL



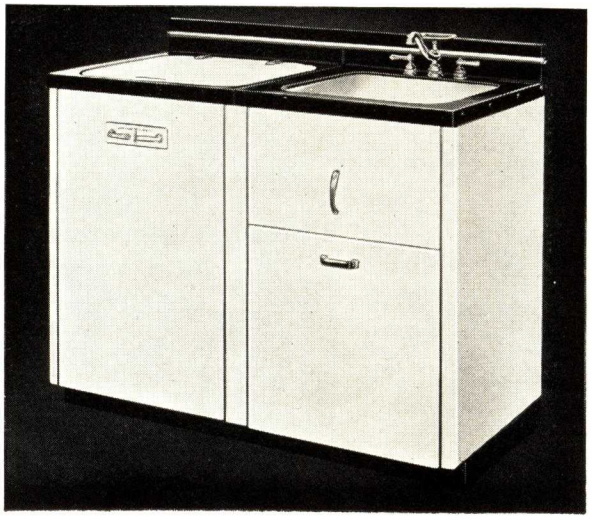
The G-E Disposall completely disposes of all food waste—even bones—at the kitchen sink, by shredding it to a thin pulp which is flushed away down the drain like waste water. The Disposall is entirely self-contained and can be attached to practically any kitchen sink. It is attached to the sink drain and provides bracket for adjustable height from the floor. It is thoroughly sanitary because it cleans itself as it disposes of the food waste. No clogged pipes, either, because the scouring action of the pulp as it is flushed away keeps the drain lines clean.

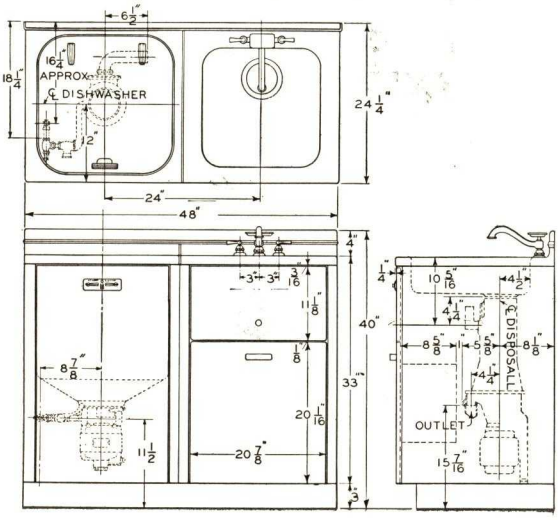


equals

GENERAL ELECTRIC SINK

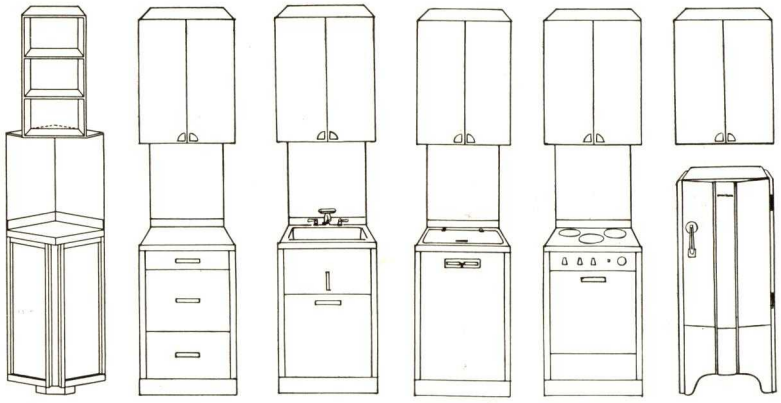
The G-E Electric Sink combines both the G-E Dishwasher and Disposall in a beautiful sturdy steel cabinet complete with hardware, cabinet, back splash, storage drawer and kick space. Finished in durable white Glyptal-baked enamel with porcelain enamel top rim and sink bowl. This one appliance does the work quicker, better and easier.





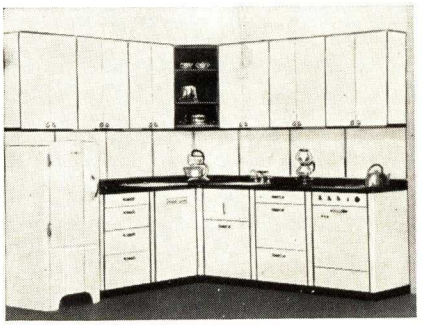
GENERAL ELECTRIC UNIT KITCHEN

The complete G-E Unit Kitchen is assembled by using various combinations of the six basic sections: (1) the base cabinet section with storage drawers; (2) the sink section with either storage bin or Disposall; (3) the Dishwasher section; (4) the 3 or 4 Burner Range section; (5) the Refrigerator sections, and (6) the corner section. The maximum height of each section is 88½ in., and the standard width is 24 in. A 12-in. cabinet, and 18-in. broom cabinet and utensil cabinet; and various sized top storage cabinets with or without concealed interior lighting are also available for use with the basic sections. Lighting molding with convenience outlets, or plain moldings are available for use between upper cabinets and wall panels. The Unit kitchen is equally adaptable to existing kitchens as well as new kitchens—regardless of layout or construction.



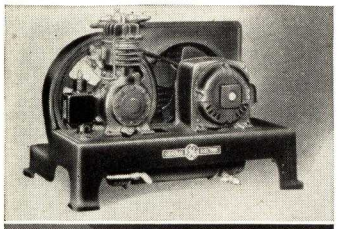
Corner Section | Base Cabinet Section with Storage Drawers | Sink Section with Storage Bin or Disposall | Dishwasher Section | 3 or 4-Burner Range Section | Refrigerator Sections

Simple—Flexible—Uniform—Complete



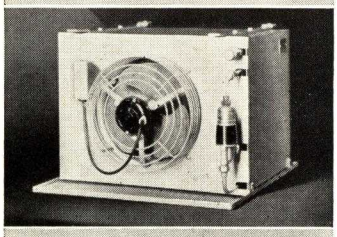
COMMERCIAL REFRIGERATION FOR EVERY NEED IN EVERY INDUSTRY

Owing to limited space, only a few models of the extensive General Electric Commercial refrigeration line can be shown here. Whatever requirements may be there is General Electric refrigeration equipment exactly suited to your needs. For complete information call the General Electric Distributor in your city or write direct to General Electric Company, Specialty Appliance Department, Neal Park, Cleveland, Ohio.



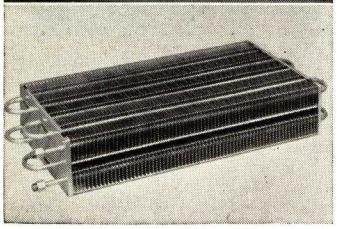
G-E "Scotch Giant" Refrigerating Units

A complete line for every application. Sizes from ¼ to 50 hp. Built for years of dependable performance at low operating cost



G-E Conditioned-Air Cooling Units

"Conditioned-Air" (method of forced air cooling) was pioneered and developed by G-E. Provides correct temperature, humidity and air circulation. Wide range of models

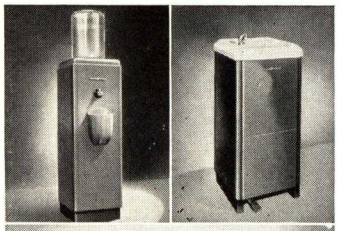


G-E Spinner Finned Cooling Units

Outstanding in performance, yet they cost no more than ordinary coils. Years ahead in cooling efficiency. Any size, shape or type available

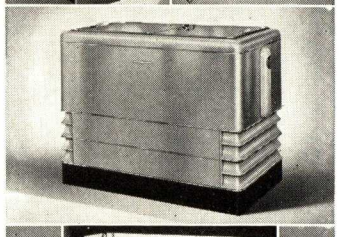
G-E Water Coolers

A complete line of bottle type, pressure type and industrial type coolers. Modern in design, with dozens of features of sanitation, convenience, economy and long life



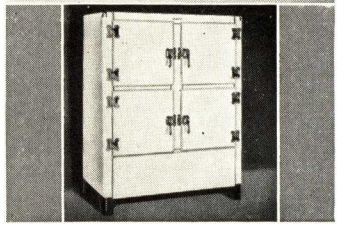
G-E Beverage Coolers

Three models to choose from. Striking, modern design. Sliding lips. Rugged construction and more than a dozen other features



G-E Storage Cabinets

Available in sizes up to 60 cu. ft. 3-coat porcelain finish, exterior front and sides. All-steel exterior and interior



Bar and Beer Cooling Equipment—A complete line of G-E refrigerated equipment for the smallest tavern or the largest club or taproom.

HOME APPLIANCE DISTRIBUTORS

ALLENTOWN, PA.
General Electric Supply Corp.
1249 Liberty St.

ATLANTA, GA.
W. D. Alexander Co.
380 Peachtree St.

ATLANTIC CITY, N. J.
Clark Adams, Inc.
2933-35 Atlantic Ave.

BALTIMORE, MD.
General Electric Supply Corp.
5 So. Gay St.

BIRMINGHAM, ALA.
Matthews Elect. Supply Co.
1820 First Ave., No.

BOSTON, MASS.
General Electric Supply Corp.
378 Stuart St.

BOSTON, MASS.
W. L. Thompson, Inc.
700 Commonwealth Ave.

BUFFALO, N. Y.
Frank W. Wolf, Inc.
779 Main St.

BUTTE, MONT.
General Electric Supply Corp.
900 E. Front St.

CHARLESTON, W. VA.
Electric Home Appliance Co.
1038 Quarrier St.

CHARLOTTE, N. C.
L. W. Driscoll, Inc.
730 E. Trade St.

CHICAGO, ILL.
R. Cooper, Jr., Inc.
221 No. LaSalle St.

CINCINNATI, OHIO
Barger, Inc.
801 Race St.

CLEVELAND, OHIO
General Electric Supply Corp.
4958 Woodland Ave.

COLUMBIA, S. C.
Perry-Browne, Inc.
1611 Main St.

COLUMBUS, OHIO
Bard, Inc.
215 No. 4th St.

DALLAS, TEX.
General Electric Supply Corp.
2115 Griffin St.

DAVENPORT, IOWA
Crescent Elect. Supply Co.
427 Pershing Ave.

DENVER, COLO.
V. K. Sweeney, Inc.
13th Ave. and Broadway

DES MOINES, IOWA
General Electric Supply Corp.
513 E. Court Ave.

DETROIT, MICH.
General Electric Supply Corp.
2985 E. Jefferson St.

EL PASO, TEX.
E. O. Cone Co.
P. O. Box 1532.

ERIE, PA.
General Electric Supply Corp.
2005 State St.

FARGO, N. D.
Dakota Elect. Supply Co.
123 Broadway

FRESNO, CALIF.
Valley Elect'l Supply Co.

HARTFORD, CONN.
Orkil Electric Co., Inc.
P. O. Box 208 (175 Ann St.)

HONOLULU, HAWAII
W. A. Ramsay Ltd.
74 Queen St.

HOUSTON, TEX.
Edmundson Refrig. Corp.
701 Waugh Drive

INDIANAPOLIS, IND.
Electric Appliances, Inc.
120 W. North St.

KANSAS CITY, MO.
General Electric Supply Corp.
1411 Walnut St.

LANCASTER, PA.
Raub Supply Co.
James and Concord Sts.

LITTLE ROCK, ARK.
O'Bannon Bros.
101 Terminal Warehouse Bldg.

LONG ISLAND CITY, N. Y.
Rex Cole, Inc.
25-11 Hunters Point Ave.

LOS ANGELES, CALIF.
Geo. Belsey Co., Ltd.
1001 South Hope St.

LOUISVILLE, KY.
General Electric Supply Corp.
207-209 E. Broadway

MILWAUKEE, WIS.
E. H. Schaefer Corp.
863 No. Plankinton Ave.

NASHVILLE, TENN.
General Electric Supply Corp.
128 Sixth Ave., So.

NEWARK, N. J.
Philip H. Harrison & Co.
191 Central Ave.

NEW ORLEANS, LA.
General Electric Supply Corp.
733 Tchoupitoulas St.

OKLAHOMA CITY, OKLA.
General Electric Supply Corp.
127 E. California St.

OMAHA, NEB.
General Electric Supply Corp.
814 So. 14th St.

PHILADELPHIA, PA.
Judson C. Burns, Inc.
31st and Oxford Sts.

PITTSBURGH, PA.
Ochiltree Electric Co.
505 Liberty Ave.

PORTLAND, ORE.
General Electric Supply Corp.
230 N. W. Broadway

PROVIDENCE, R. I.
E. Pulver Cook, Inc.
72 So. Main St.

RICHMOND, VA.
R. S. Montgomery, Inc.
205 E. Grace St.

ST. LOUIS, MO.
James & Co.
4144 Lindell Blvd.

ST. PAUL, MINN.
General Electric Supply Corp.
174 E. 6th St.

ST. PETERSBURG, FLA.
Geo. Patterson, Inc.
Times Bldg.

SALT LAKE CITY, UTAH
General Electric Supply Corp.
310 W. 2nd South St.

SAN FRANCISCO, CALIF.
General Electric Supply Corp.
1201 Bryant St.

SCHENECTADY, N. Y.
A. Wayne Merriam, Inc
136 Erie Blvd.

SEATTLE, WASH.
General Electric Supply Corp.
1212 First Ave., So.

SPRINGFIELD, MASS.
Breckenridge, Inc.
214 Birnie Ave.

SYRACUSE, N. Y.
Gould-Farmer Co., Inc.
321 W. Onondaga St.

TOLEDO, OHIO
H. G. Bogart Co.
217-219 Cherry St.

TORONTO, ONTARIO, CANADA
Canadian General Electric Co., Ltd.
212 King St., W.

UTICA, N. Y.
Langdon & Hughes
229 Elizabeth St.

WASHINGTON, D. C.
General Electric Supply Corp.
1328 New York Ave., N. W.

WHEELING, W. VA.
West Virginia Appliance Co.
1311 Chapline St.

WILLIAMSPORT, PA.
Lowry Elect. Co., Inc.
643 Elmira St.

General Electric Home Bureau, 570 Lexington Avenue, New York, N. Y.

C. V. HILL & CO. INC.

HILL PRODUCTS DIVISION

TRENTON, N. J.

REACH-IN REFRIGERATORS
REFRIGERATED DISPLAY CASES
ICE MAKERS

WALK-IN REFRIGERATORS
DAIRY REFRIGERATORS
MORTUARY REFRIGERATORS

For Cold Storage Doors, see File Index

REACH-IN REFRIGERATORS

For Hotels, Clubs, Restaurants, Institutions, Hospitals, Bakeries, etc.

Design and Engineering Service for Special Equipment

We maintain a competent staff of refrigeration engineers and designers to assist contractors and architects in problems of refrigeration and layout. Complete specifications and blueprints of special models will be furnished upon request. Standard models are completely described in the HILL Reach-in-Refrigerator Catalog, sent upon request.

Only ONE Quality

HILL refrigerators are built especially for commercial service by a 50-year old company specializing in the production of commercial refrigerators and famous for the quality of its products. HILL Reach-in Refrigerators are produced in only *one quality*—the *best*. All models are of the same sanitary, *all*-porcelain, wear-proof construction to withstand the hard usage to which commercial refrigerators are necessarily subjected. All have 3½ in. of high quality insulation in order to keep down operating costs despite use in hot kitchens. All are of sectional construction. All have inside lights. Unlike other manufacturers, we have no second or third quality lines, because only the *best* gives the buyer the greatest value in durability, appearance and economy.

A WIDE RANGE OF TYPES AND SIZES

Made for Self-contained Refrigeration, Remote Refrigeration, and for Ice-making Units or Conventional Coils

Model	Net Food capacity cu. ft.	Number of doors	Shelf area, sq. ft.	Exterior dimensions, incl. 6-in. removable legs, in.			Coil chamber, in.			Refrigeration
				L	D	H	L	D	H	
20R-2	20	2	20	30⅜	34¾	87½	23½	15½	11½	Remote
29R-3	29	3	22	48	32¾	78	42	15½	11½	Remote
29R-4	29.1	4	37.8	48	32¾	78	42	15½	11½	Remote
44R-3	44.6	3	29.½	58	34¾	87½	52	15½	11½	Remote
44R-4	44.6	4	51.½	58	34¾	87½	52	15½	11½	Remote
68R-5	68.7	5	57.9	85⅝	34¾	87½	78⅝	15½	11½	Remote
68R-6	68.7	6	80	85⅝	34¾	87½	78⅝	15½	11½	Remote
22R-4	22.8	4	25.5	48	32¾	64½	18	19½	26	Ice maker Remote
35R-3	34.8	3	14.7	58	34¾	72	24½	26	31½	Ice maker Remote
35R-4	34.8	4	36.7	58	34¾	72	24½	26	31½	Ice maker Remote
55R-5	55.2	5	42.2	85⅝	34¾	72	22½	23½	31½	Ice maker Remote
55R-6	55	6	62.4	85⅝	34¾	72	22½	23½	31½	Ice maker Remote

Hill Features

Genuine Porcelain on 18-gauge Steel, both Inside and Outside—Enamel paint or lacquer, frequently used for refrigerators, scratches, stains or wears off under the hard usage of commercial service.

Water-tight, Welded Floor—Floor and sides *welded* into one continuous piece before enamel is applied. Moisture cannot leak through to rot and deteriorate insulation. Rounded interior corners and built-in floor drain facilitate cleaning.

Extra Insulation—All HILL Reach-in Refrigerators have 3½ in. of insulation —½ to 1 in. more than usually used for this type of refrigerator. A continuous heat-proof and air-proof wall of insulating board completely covers the interior insulation both inside and outside.

Warp-proof, Hard Rubber Door Jambs—Will not warp, break or discolor. Sanitary and easy to clean.

Adjustable Shelves—Can be set at different heights, 2 in. apart. Made of heavy wire rod, tinned and welded.

Sturdy, Bronze Chrome-plated Hardware—Fastener of special design keeps door tightly closed. Fitted with locking device.

Metal Sills—On lower doors to withstand wear; designed to prevent through conduction.

Porcelain-clad Coil Chamber of Special Design—Nothing to corrode or rust. Insulated to prevent condensation from forming and dripping from underside; designed to prevent ice from building up under coils. Ample coil space and correct design make possible the maintenance of desirably high humidity, correct temperature, and adequate circulation.

Take-down Construction — Concealed bolts. No outside metal bolt caps to tarnish or catch dirt. Usually shipped assembled, can be taken down for passage through narrow doorways.

Corners—Neatly rounded corners and graceful proportions.

Interior Light—Turned on by convenient outside switch.

Hinged Coil Door in Front — Gives quick and easy access to coils. Neat design. No screws or exposed fasteners.

Send for Complete Illustrated Catalog Containing All Specifications

McCRAY REFRIGERATOR COMPANY

Manufacturer of Refrigerators for All Purposes

755 Lake Street
KENDALLVILLE, IND.

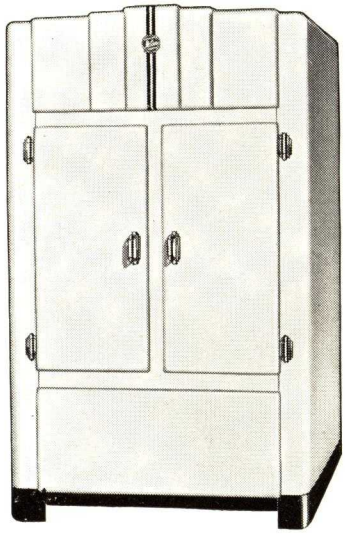
SALESROOMS IN ALL PRINCIPAL CITIES—SEE TELEPHONE DIRECTORY

Products

REFRIGERATORS, DISPLAY CASES, COOLERS and COMPRESSORS for all purposes.

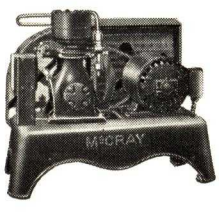
Custom Built Refrigerators Plus Exact Refrigeration by McCray

The smart town house or fine country home can now be equipped with both refrigerators and refrigeration especially designed by McCray. Custom built refrigerators have long been an outstanding product of the McCray organization. Now McCray refrigeration is available as well—refrigeration the chief characteristic of which is exact engineering. For each custom built refrigerator McCray Engineers specify the precise mechanical requirements. This procedure, which in itself is so vastly different from the methods of mass production, marks a distinct advance in the making of complete made-to-measure refrigerating equipment. For years the finer homes of America have been equipped with McCray refrigerators. The outstanding early success of the McCray factory was, perhaps, in this particular field—that of specially designed refrigerators. The reputation gained in those years has continued to distinguish McCray craftsmanship. Today the McCray nameplate is an instantly recognized mark of quality.



McCray Model RF-418

Complete with McCray compressor, coils and valves, Model No. RF-418 assures efficient, economical refrigeration. Compressor is installed in base of cabinet. Exterior front and both ends, as well as entire interior, of white Duralite. Walls approximately 4 in. thick, insulated with 3 in. of pure corkboard sealed with hydrolene. Metal bar shelves electrically welded. Chrome plated bronze hardware, self-closing fasteners. Available with ice maker. Dimensions 3 ft. 10¼ in. wide; 2 ft. 4 in. deep; 6 ft. 6 in. high.



McCray Compressor
Specially engineered for use with McCray cabinets. Model 13 illustrated.

Individually Designed Refrigerators and Made-to-Measure Refrigeration

The McCray staff counts among its members, engineers who are masters of design and leaders in the field of refrigeration engineering. In this department the meeting of exact specifications is of paramount importance. The record in designing refrigerators for fine homes and producing refrigeration of precise requirements is already an impressive one. This staff of engineers is ready to give its best to building and modernizing programs.

With the McCray set-up, the machine equipment for any installation is neither over-specified nor under-specified. Every installation has that particular machine designated that will give highest efficiency. With the same purpose in mind—to secure perfect refrigeration—McCray units not only produce certain temperatures but also definite conditions of relative humidity, for proper preservation of foods. This is the supreme objective of all McCray craftsmanship.

Custom Built Refrigeration for Hotels, Clubs and Institutions

McCray builds to order to meet every refrigeration need. Special engineering service, covering both machine and cabinet requirements, is offered to architects, without obligation. McCray's nearly 50 years' experience is at your command in meeting all refrigerator needs whether commercial or residential. This service is available direct from the factory or through McCray branch offices located in all principal cities.

McCray Model RE-664-S

Equipped with McCray coils and ready for use with any type of electric refrigeration. A McCray compressor, specially engineered for use with this model, and the combination of McCray case, coils and compressor, gives triple insurance of efficient, economical operation. Both interior and exterior, front and ends of cabinet are of white porcelain. 3 in. of pure corkboard sealed with hydrolene insulates the walls. Size of model is 6 ft. 5⅛ in. wide; 2 ft. 11⅜ in. deep; 6 ft. 10¼ in. high.

NATIONAL ASSOCIATION OF ICE INDUSTRIES

Air-Conditioning (Portable and Permanent Units), Beverage Cooling (Draught and Bottle), Milk Cooling, Water Cooling, Commercial Refrigeration, Household Refrigeration, Truck Refrigeration

228 No. La Salle Street, CHICAGO, ILLINOIS

For Air-Conditioning Units, see File Index

New and different is the latest scientific achievement in refrigeration—the modern *air-conditioned* ICE refrigerator. Introduced but recently, it already has had enthusiastic reception in thousands of homes and places of business.

By using ice in an entirely new way, this refrigerator does more—much more—than just keep foods cold. It gives them *complete,* 3-way protection, which means:

Constant Cold . . . uniform, safe temperature to prevent spoilage.

Proper Moisture . . . to protect foods against rapid drying out and against loss of flavor and nutrition.

Clean-washed Air . . . to guard against the mingling of food flavors.

This Seal on a refrigerator is assurance that it conforms to standards of construction and performance established by the National Association of Ice Industries.

In the modern, non-mechanical ICE refrigerator there is nothing to get out of order—no noise—no defrosting—no expensive repair bills to pay. One icing ordinarily lasts from three to five days. Initial cost is so low that one can outfit almost an entire kitchen with the money saved.

The new, *air-conditioned* ICE refrigerator is built for a lifetime of service by a number of manufacturers and approved by the NATIONAL ASSOCIATION OF ICE INDUSTRIES. Models and sizes are now available to fit the needs of any home, institution or place of business.

Write or wire for full information regarding prices, specifications, etc.— or consult your local ice company and arrange for a modern ICE refrigerator to be delivered on *free trial.*

FEATURES

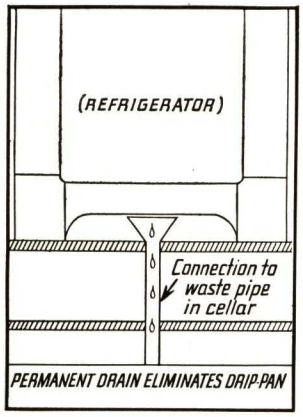
Accessories—Ice cubes can be cut from the ice in less than five minutes with the handy ice cuber. . . . Ice cream is ready to serve in less than an hour with the frozen dessert unit. . . . Shelves are adjustable with lift-out or cut-out sections for bulky foods and bottles. . . . In some models—interior light, fruit basket, egg rack and a utility compartment for foods not needing refrigeration.

Appearance—From top to bottom the new ice refrigerator is a harmony of modern beauty—enhancing the attractiveness of any kitchen. Its corners are gracefully streamlined, its top and doors fluted and its base is finished smartly in modern black or white. Latches and handles are heavily chromium plated. The cabinet is beautifully and permanently finished in gleaming white high-baked enamel or porcelain.

Construction—Only the finest of materials and the finest of workmanship go into the modern ice refrigerator. Insulation, several inches in thickness and wrapped in water-proof paper, is sealed tightly to the walls. Doors fit tightly in the door openings, aided by heavy rubber gaskets which prevent the passage of air and heat. All this aids in reducing ice meltage to a minimum.

Economy—With icing needed only at infrequent intervals and with no machinery to get out of order or to repair, the modern ice refrigerator is very economical to operate. Best of all, perhaps, from the buyer's standpoint is the fact that the new ice refrigerator has the lowest initial cost which means savings in interest on investment and depreciation.

Performance—3-way refrigeration gives foods *complete* protection—keeps them fresher, better-tasting.

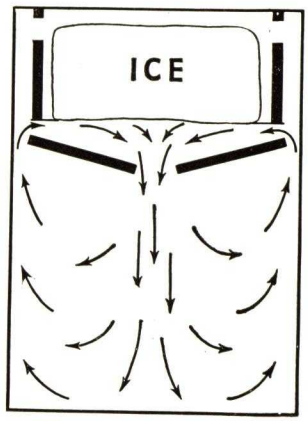


Drain

A rustproof copper drain, that stays clean almost by itself, can be installed permanently, quickly and inexpensively. It runs from the floor to an outlet and eliminates the need for a "drip-pan". Include the drain in your plans for refrigeration.

Circulation

The air in a modern ice refrigerator travels a *directed* course—from the ice compartment to the food compartment and back again. As the air passes over the film of water on the ice it is properly humidified and washed clean—food odors and impurities pass harmlessly down the drain.



WILLIAMS OIL-O-MATIC HEATING CORPORATION

Manufacturers of Ice-O-Matic Household and Commercial Refrigeration, Electric and Gasoline-Powered Compressors, and Milk Cooling Equipment

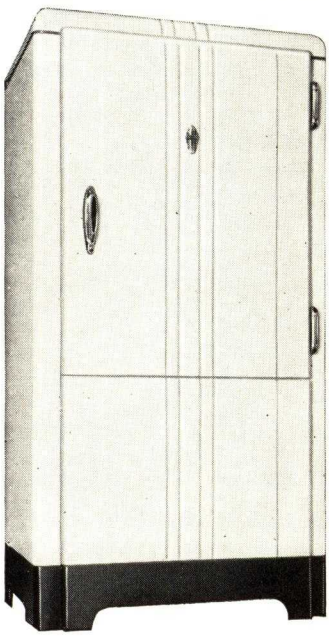
BLOOMINGTON, ILL.

ENGINEERING SERVICE TO ARCHITECTS AND BUILDERS

CHICAGO, ILL., 641 No. Michigan Avenue — NEW YORK, N. Y., 1231 Graybar Building

For Williams Oil-O-Matic Oil Burner Equipment and Air-O-Matic Air Conditioning Equipment, see File Index

A Complete Line



Williams Oil-O-Matic offers a complete line of domestic and commercial refrigeration equipment under our trade-mark "Ice-O-Matic"; a full range of sizes from 4 to 19 cu. ft. in domestic electric models in both a popular priced standard line and a de luxe line; cabinet models up to 66 cu. ft. capacity with a full line of compressors and 250 types of cooling coils both flooded and dry, and forced draft unit coolers, affording equipment for every kind of commercial installation; also a full line of milk cooling equipment, both electro and gas engine powered.

Designed and built by temperature control specialists, Williams Ice-O-Matic is electrically and mechanically dependable. Each component part is designed and built to fit its particular place in the entire assembly. Every unit is precision made. Tolerances are as close as those used by manufacturers of far more delicate machinery. Employing the most efficient practical refrigerant, our engineers have developed and patented numerous valuable features of design which are exclusive to Ice-O-Matic, contributing greatly to long service life. Every unit combines ruggedness, strength, pleasing appearance and compactness with complete accessibility—is built to last for years.

All model compressors equipped with simple but positive pressure lubrication to all bearing surfaces. Combination air-water cooled compressors permit minimum usage water for condensing requirements.

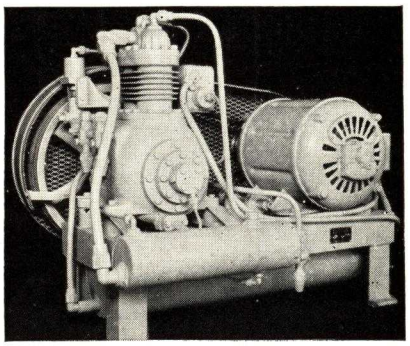
SPECIFICATIONS

	Model 4 cu. ft.	Model 5 cu. ft.	Model 6 cu. ft.	Model 8 cu. ft.	Model 12 cu. ft.	Model 15 cu. ft.	Model 19 cu. ft.
Exterior finish	3-coat Dulux	3-coat Dulux	Porcelain or Dulux	Porcelain or Dulux	Porcelain	Porcelain	Porcelain
Shelf area, cu. ft.	9.9	11.3	14.8	17.3	28.5	33.3	38.6
Food storage, cu. ft.	Gross 4.60 Net 4.3	Gross 5.80 Net 5.4	Gross 6.9 Net 6.2	Gross 8.40 Net 7.5	Gross 12.8	Gross 15.2	Gross 19.2
Ice making capacity	2 trays 42 cubes 4.27 lbs.	3 trays 63 cubes 6.41 lbs.	4 trays 84 cubes 8.54 lbs.	6 trays 126 cubes 12.82 lbs.	4 trays 84 cubes 11.2 lbs.	4 trays 84 cubes 11.2 lbs.	5 trays 105 cubes 14 lbs.
Accessories	E F G H	A B C D E F G H	A B C D E F G J K	A B C D E F G J K	F G C B	B C F G	B C F G
Height	52½″	56½″	58¾″	63″	67⅞″	70″	72″
Width	24⅜″	26⅜″	29″	31⅞″	40″	44″	48″
Depth	24 11/16″	24 11/16″	24 11/16″	24 15/16″	26″	26″	27¼″

A—Utility basket. B—Cabinet light. C—Vegetable freshener. D—Flexo tray. E—Temperature indicator. F—Evaporator front. G—Evaporator door. H—1-cyl. compressor. J—2-cyl. compressor. K—Utility drawer, including three glass covered jars.

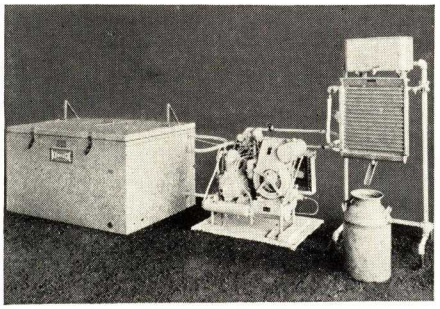
Commercial Compressors

Ice-O-Matic offers 10 sizes of compressor units (electric and gasoline driven)—⅛ to 10 hp. to meet practically every commercial and industrial requirement. A distinctive feature of Williams Ice-O-Matic Compressor units is full pressure lubrication to all bearings, with a patented rectifier to separate the oil from the refrigerant. Highly efficient valves insure economical operation.



Milk Cooling Equipment

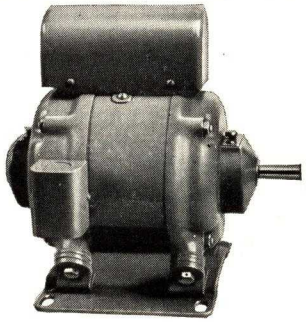
Williams Ice-O-Matic Milk Cooling equipment offers a full line of self-contained cooler units, complete with cabinets, or compressor and coils of various capacities to equip your own cabinet. Reserve power is afforded to take care of extra loads. Available with either electric motor or gasoline engine drive. Water circulating pump, powered from compressor, available for all parts.



The complete line is so flexible as to be easily adaptable to any size or type of dairy.

Williams Capacitor Type Motor

Long life, fractional horsepower alternating current motors for all purposes. "Capacitor Start" or "Capacitor Start and Run" from ⅛ to ⅓ hp. "Split phase" from 1/16 to ⅛ hp. Williams motors exceed by a wide margin the requirements of the National Electrical Manufacturers Association, the American Institute of Electrical Engineers and the National Board of Fire Underwriters. Each motor is built with a reserve capacity for emergency requirements. No radio interference or other brush and commutator difficulties.



Engineering Service

Engineering service is available to architects and builders.

BAKER ICE MACHINE CO., INC.

Manufacturers of Mechanical Cooling Equipment, Air Conditioning and Commercial Refrigeration

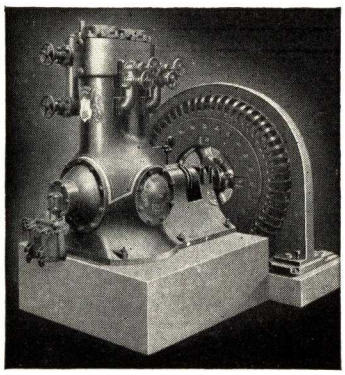
GENERAL OFFICES AND FACTORY
1527 Evans Street, OMAHA, NEB.

BRANCH FACTORIES: FORT WORTH, LOS ANGELES, SEATTLE
EASTERN SALES: NEW YORK, N. Y. CENTRAL SALES: CHICAGO, ILL.
Sales and Service in All Principal Cities

BAKER'S COMPLETE LINE—DESIGNED TO MEET ALL ENGINEERING REQUIREMENTS

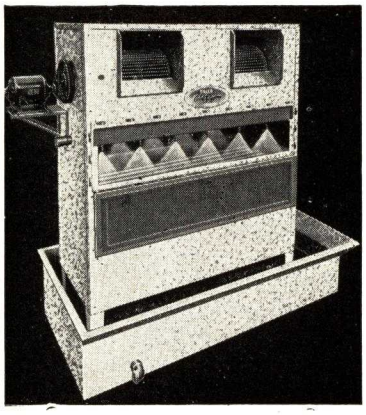
Every machine and cooling assembly offered by Baker is precision-manufactured and designed to offer the greatest amount of service, dependability and economy per dollar invested. That statement is backed by more than 30 years of leadership in the field of mechanical cooling. Write for specifications and full information about the Baker line.

Baker Ammonia Compressors



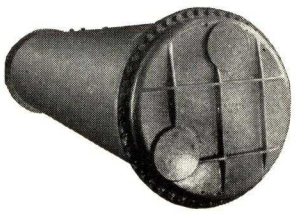
Available to 100 tons capacity in single units, direct connected or V-belt drive. Baker Compressors are of the vertical, enclosed, single acting type, and may be arranged in duplex or multiple installations for any desired capacity. Also equipped with double suction, capacity reduction where conditions require utmost economy in operation. Available in automatically controlled self-contained units ranging from 1 to 25 tons capacity at 30° suction temperature, two and four-cylinder types.

Baker Coldstream Brine Spray Units



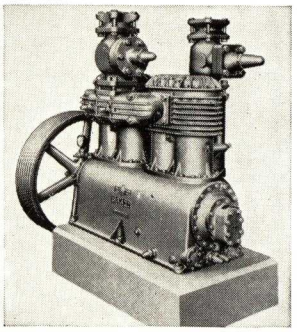
Designed in both gravity flow and forced draft types for industrial applications requiring uniform control of temperatures and relative humidity. Equipped with slow-speed, large capacity blower type fans mounted on self-aligning ball bearings. Fan speeds may be easily changed to suit special air velocity requirements. Housing is of heavy boiler plate construction for noiseless, vibrationless operation.

Baker Shell and Tube Condensers



Baker Condensers and Liquid Coolers are made in all sizes up to 2500 sq. ft. of effective cooling service. Vertical, horizontal, multipass or single pass types available, with diameters and tube lengths to fit any specification.

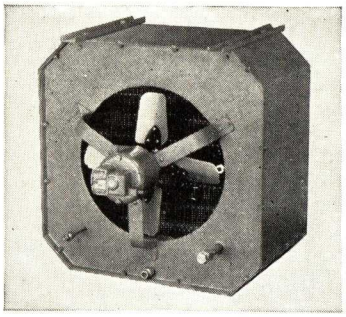
Baker Freon or Methyl Chloride Units



Baker offers the most complete line of compression units on the market. Low pressure, automatic, self-contained units from ¼ to 30 h.p., two and four-cylinder types, designed for air conditioning or commercial refrigeration applications; dual condensing units with full automatic control for variable load requirements, sizes from 20 to 30 h.p.; vertical enclosed type Freon Compressors especially designed for air conditioning, two and four cylinders, 20 to 60 h.p. Mechanical features: full pressure lubrication, genuine Timken roller bearings, shell and tube condensers, positive balanced type crankshaft seal, Nickelite connecting rod bearings.

Baker Fan Type Coldstream Units

Rigid construction for compact, heavy duty service in refrigerating and air conditioning perishable products requiring positive control of temperatures above the freezing point. Finned coil surfaces and air velocity designed for a correct combination of temperature and relative humidity.



Baker Coldstream Heavy-Duty Blower Type Units

Designed for high capacity comfort cooling or commercial and industrial air cooling. Equipped with finned or galvanized bare pipe coil; fans direct connected or V-belt driven.

Made in floor type or suspended units ranging in size from 2 to 16 tons refrigerating, 2000 to 16000 c.f.m. air, capacity.

Inquiries

Address all inquiries to Baker Ice Machine Co., Inc., general offices and factory, 1527 Evans Street, Omaha, Neb. Branch factories at: Fort Worth, Los Angeles, Seattle.

Baker—Authority on Mechanical Cooling for Over 30 Years

CURTIS REFRIGERATING MACHINE COMPANY

ST. LOUIS, MISSOURI, U. S. A.

86 Condensing Units from 1/6 to 30 Hp.

CURTIS REFRIGERATION AIR CONDITIONING AND COMMERCIAL

Air Conditioning and Commercial Refrigeration

GENERAL INFORMATION ABOUT CURTIS

86 models comprise the Curtis line of condensing units. There are 41 air-cooled units ranging in size from 1/6 to 5 HP., inclusive, and 45 water-cooled units in sizes from 1/3 to 30 HP., inclusive. Counterflow condensers are supplied in models from 1/3 to 15 HP. Cleanable shell and tube condensers available with units from 3 to 30 HP. All models are available for either Freon (F 12) or Methyl Chloride.

In the Curtis line are units designed especially for air conditioning—also for ice cream cabinets, refrigerated trucks, display cases with self-contained units, and the like. Gasoline powered models and special designs also available.

Curtis supplies a line of standard coils and forced draft unit coolers to balance Curtis condensing units.

MECHANICAL FEATURES OF CURTIS UNITS

All Curtis Compressors employ "centro-ring" positive pressure lubrication—an exclusive oiling system which has only one moving part—no gears or plungers.

Other Curtis engineering refinements include:

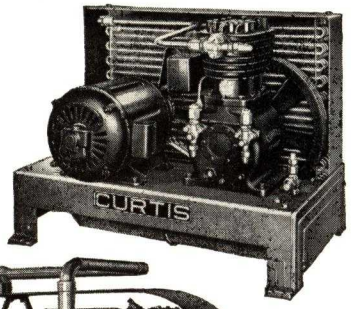
(1.) Timken Tapered Roller Bearings.
(2.) Positive pressure oiling system.
(3.) Water jacketed Heads and Cylinders.
(4.) Built-in Oil Separator with automatic return.
(5.) Drop forged, alloy steel, heat-treated Crank Shaft and Connecting Rods.
(6.) Individual correct displacement compressors for each motor size.
(7.) Balanced sylphon bellows seal.
(8.) Unusually large receivers and condensers assure maximum efficiency.

TYPICAL CURTIS UNITS

Model MAR 150 R

1½-HP. Air-Cooled Condensing Unit (Remote Type).

Bore and stroke 2½x3 in. Speed 360 RPM. Low Pressure Pilot Control Switch. Magnetic motor starting switch with overload protection. Receiver Capacity 31 lbs. CH_3 CL 45 lbs. F-12. Maximum allowable working charge 21 lbs. CH_3 CI 30 lbs. F-12. Weight of charge 7 lbs. CH_3 CL or F 12

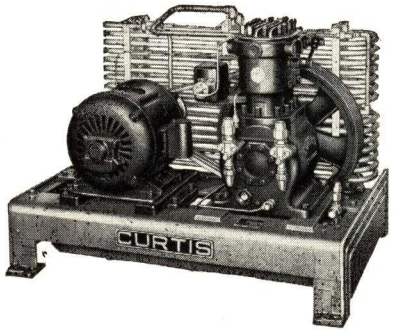


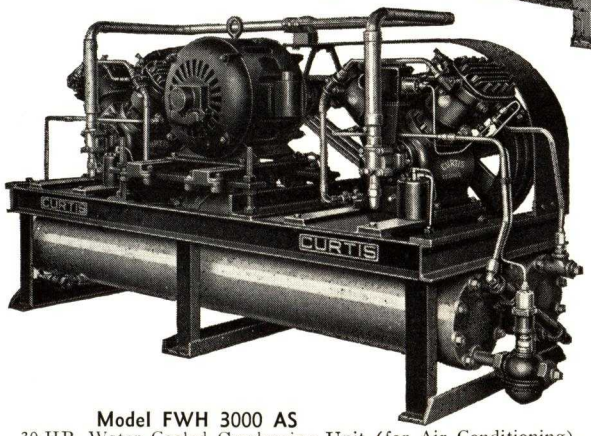
Model FWH 500 AC

5-HP. Water Cooled Condensing Unit (for Air Conditioning).

Counterflow Condenser Type.

Bore and stroke 3½x3½ in. Speed 470 RPM. High and Low Pressure pilot control switch. Magnetic motor starting switch with overload protection. Receiver capacity 41 lbs. CH_3 CL 60 lbs. F 12. Maximum allowable working charge 27 lbs. CH_3 CL 40 lbs. F 12

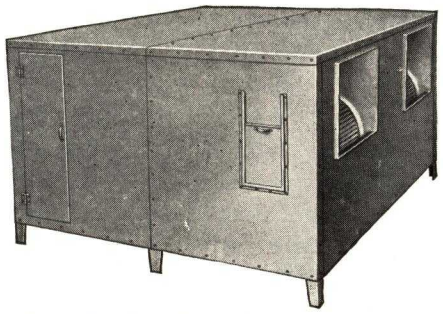




Model FWH 3000 AS

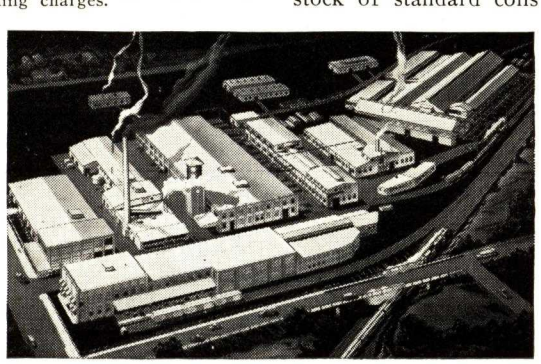
30-HP. Water Cooled Condensing Unit (for Air Conditioning). Cleanable Shell and Tube Type.

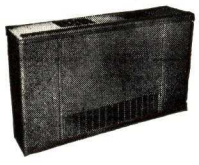
Bore and stroke 3½x3¾ in. High and low pressure pilot control switch. Magnetic motor starting switch with overload protection. Receiver capacity 470 lbs. F 12. Maximum allowable working charge 313 lbs. F 12. Refrigerant shipped with holding charges.



Curtis coils and forced draft unit coolers for refrigeration and air-conditioning are designed and built to balance perfectly with the highly efficient Curtis condensing units. Curtis coils include such important features as Rigid Fin Spacers, Multi-tube Construction, perfectly bonded large primary surface and heavy secondary surface. A complete stock of standard coils and unit coolers is always available, while special coils and unit coolers can be furnished on short notice.

Curtis has been in business since 1854—and has built condensing units since 1922. Today, a million-dollar corporation with the engineering and production facilities of a modern 20-acre plant produces and stands behind Curtis products.





FRICK COMPANY

Refrigerating and Ice-making Machinery

WAYNESBORO, PENNSYLVANIA

BRANCH OFFICES FOR SALES AND ENGINEERING SERVICE

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DISTRIBUTORS AND STOCK POINTS IN 150 PRINCIPAL CITIES THROUGHOUT THE WORLD

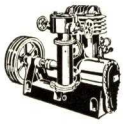
TRADE FRICK MARK

Refrigeration

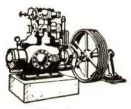
COMPRESSORS

Low Pressure Units

Ammonia Systems



Freon-12 Systems

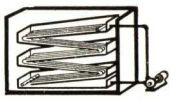


Carbon Dioxide Systems

Of all types, in sizes from ¼ to 1000 horsepower. Built for a lifetime of service—many Frick machines installed in the eighties and nineties are still in operation.

Ask for Ice and Frost Bulletins 97, 98, 102, 104, 112, 118, 508, 516.

COOLERS AND COILS



"Instant" Water Cooler

Submerged and Multipass Shell-and-Tube Coolers

In standard sizes or designed to meet your special needs.

All kinds of piping and welded work, done both in our shops and in the field. Write for Bulletins 153, 156 and 164.

CONTROLS

Electric and Float Controls

For high efficiency automatic operation.

A complete line, including float switches, float accumulators, electric shut-off valves, float controls, expansion valves, and many others. Frick valves and fittings for ammonia, Freon-12 and carbon dioxide are unequalled for tightness and long wearing qualities.

New Purger

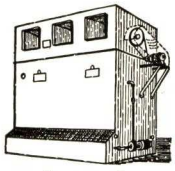
Valves and Fittings

Bulletins 200, 201 and Catalog H, featuring valves, electric controls and fittings are all included in a list of more than 50 available catalogs.

CONDENSERS

Multipass and Vertical Shell-and-Tube Condensers

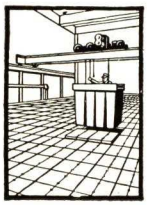
Frick condensers meet the most difficult requirements for low head pressure and water consumption, small space, and easy cleaning.



Evaporative Condensers

Double pipe, atmospheric, and small multi-pass type, with 8 in. shells, available in addition to those illustrated. Evaporative condensers combine coils with forced draft cooling tower and use very little water. Write for Bulletins 228, 230, 232 and 234.

ICE MAKING EQUIPMENT



Featuring the F-P (Frick-Pendulum) low-pressure air system of making pure clear ice from city water. Group lift and automatic controls now enable one man, working one shift, to freeze, harvest, score, store and sell up to 22 tons of ice per day.

Bulletins 50, 127 and 610.

Type VW Coils

SERVICE

Recommendations, layouts, estimates, sales, erecting and maintenance service always available through Frick Branch Offices and Distributors, the world over. Literature in addition to that mentioned, describing special phases of refrigeration—air conditioning, marine work, oil industry, breweries, fruit and fur storages, skating rinks, corrosion prevention, etc. Write for copies in which you are interested.

YORK—REFRIGERATION DIVISION

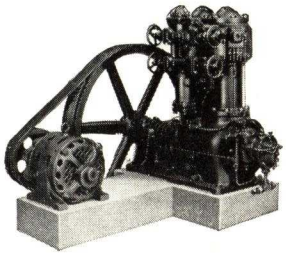
YORK ICE MACHINERY CORPORATION

GENERAL OFFICES
YORK, PA.

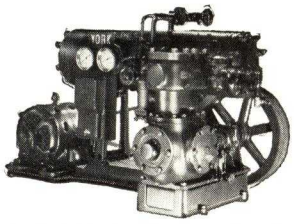
DIRECT FACTORY BRANCHES IN 71 UNITED STATES CITIES
For York Air Conditioning and Cold Storage Doors, see File Index

REFRIGERATION—AIR CONDITIONING—MILK AND ICE CREAM PLANT EQUIPMENT

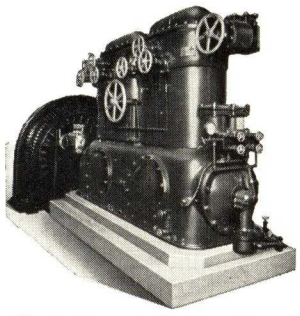
From the Largest to the Smallest—the York Line Is Complete



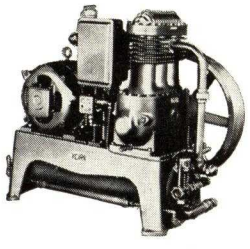
York Vertical Enclosed Single Acting Compressor for Ammonia



York Full Automatic Self-contained Refrigerating Unit for Ammonia



York Vertical Single Acting Freon (F-12) Compressor



York Full Automatic Self-contained Refrigerating Unit for Freon

And with its complete line, York offers a complete service to industry and business. York knows that it is the finished plant in operation which determines how good an investment the purchaser has made. Hence throughout the years York has created and developed an organization in which the purchaser of York equipment can concentrate full responsibility for the over-all design and proper functioning of the completed plant.

General Purpose Refrigeration Division

Compression refrigerating machines and complete systems for use with ammonia, Freon (F-12) and carbon dioxide; ammonia absorption refrigerating systems especially adapted to operation with exhaust steam.

Booster and compound compression systems for special low temperature applications.

Brine and water coolers of the York Patented Vertical Trunk Type. Special cooling applications with the York Patented Gravity Feed and Liquid Recirculating Systems.

Air Conditioning Division

Complete air conditioning systems for maintaining proper atmospheric conditions for comfort or for industrial processes. Available as central or individual unit systems. Self-contained units include spray type air conditioners and coil type coolers.

Ice Plant Division

Ice making machinery and ice plant equipment—a complete service to the ice industry.

York Vertical-Trunk Freezing Systems of the removable can type; Arctic-Pownall Stationary Can Freezing Systems.

Complete plants for production of ice in its most useful form, *"FlakIce Frozen Water Ribbons."*

Dry Ice Division

Complete systems for the production of dry ice and liquid carbon dioxide, including special by-product system which permits the efficient manufacture of dry ice with comparatively small plants at any location in the United States.

Ice Cream and Milk Plant Division

Refrigeration and complete equipment for ice cream making, dairies and milk products—ice cream freezers, homogenizers, milk and mix coolers, pasteurizers, storage and aging tanks, high-temperature short-time plate pasteurizers, etc.

Commercial Division

Self-contained refrigerating units for meat markets, groceries, delicatessens, florists, restaurants, hotels, hospitals and special applications.

Marine Division

Equipment and engineering for all marine refrigerating and air conditioning requirements.

Accessory and Supply Division

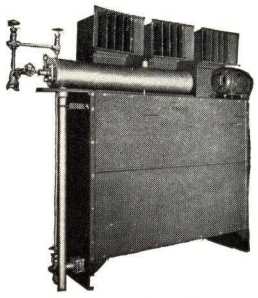
York Ammonia and Carbon Dioxide Valves and Fittings, Condensers, Brine Coolers, Coils, Receivers, Ice Cans, etc. Yorkco Cold Storage Doors. Yorkco Oils and all accessories and supplies for the operation of refrigerating plants.

Export Division

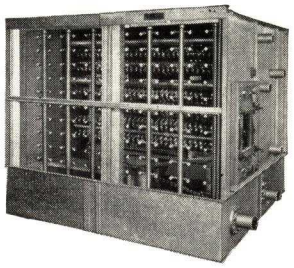
Adapts to varying needs of foreign markets, the products and service of all other York divisions. Export Division, 42nd Street and Second Avenue, Brooklyn, N. Y.

Service and Maintenance Division

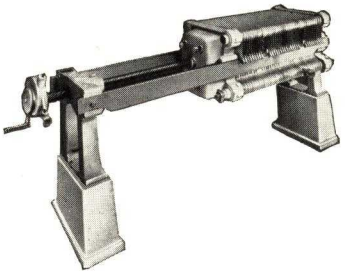
York service is at your command by communicating with the nearest of our direct factory branches. Behind every piece of York equipment are the entire resources of the York organization.



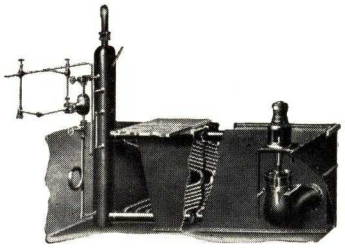
York Industrial Coil Type Air Conditioner



York Dehumidifier with Coils



York Plate Heat Exchanger



York Patented Vertical Trunk Cooler

KASON HARDWARE CORPORATION

MAIN OFFICE AND FACTORY
127-137 Wallabout Street, BROOKLYN, N. Y.
TELEPHONE
EVergreen 7-1173
SALES REPRESENTATIVES IN PRINCIPAL CITIES THROUGHOUT THE WORLD
For Kason Show Case and Store Fixture Hardware, see File Index

KASON REFRIGERATOR HARDWARE

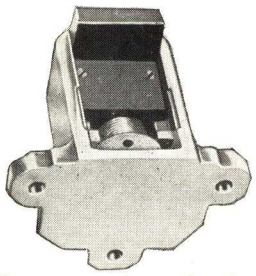
Limitation of space does not permit a complete presentation of the comprehensive line of Kason Latches and Hinges available for commercial refrigerators, refrigerated display cases, coolers and freezers. These are set forth in detail in 76 pages of Catalog No. 38 which will be cheerfully mailed to the profession. The models presented herein, however, will serve to illustrate the outstanding features of the Kason Products and will indicate the reasons for their world-wide acceptance as the finest items of hardware available to the refrigerator industry.

Kason Forged-Brass Hardware

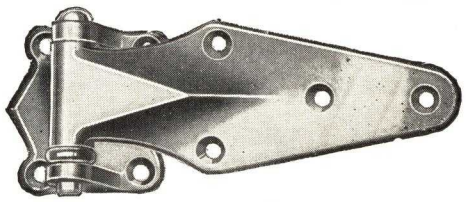
The subject of the serviceability of the refrigerator's hardware requires the special attention of the architect. Refrigerator hardware is subjected to unusual climatic and atmospheric conditions which react unfavorably on ordinary castings of even the hardier metals. To overcome this problem, Kason has developed a complete line of Forged-Brass Hardware of *super-service* quality. Forged-Brass providing as it does an elastic limit of 30,000 lbs. per sq. in., a tensile strength of 57,000 lbs. per sq. in., a Brinnell hardness of 110 and a 25% elongation in 2 ins., is the hardiest metal construction known to the industry and for the same reason Kason Forged-Brass Latches and Forged-Brass Hinges are among the sturdiest and most enduring items of hardware manufactured for refrigerator service. To avoid the hazard of interrupted refrigerator service due to broken latches or hinges, it is strongly urged that Forged-Brass be specified for these items of hardware.

Latches of Massive Sealing Power

Every line and feature of the Kason Latches is directed toward sealing the refrigerator door airtight and to guard it vigilantly against costly air leaks. The slanting tongue of the latch acts like a wedge which is forced deeply into its keeper by a dependable, relentless spring. The direct action of the simple push-pull principle of the latch provides maximum tension. The adjustable Micrometer Strike makes it possible to take up the natural play of the door (see below) and assures a perfect closure throughout the life of the refrigerator.

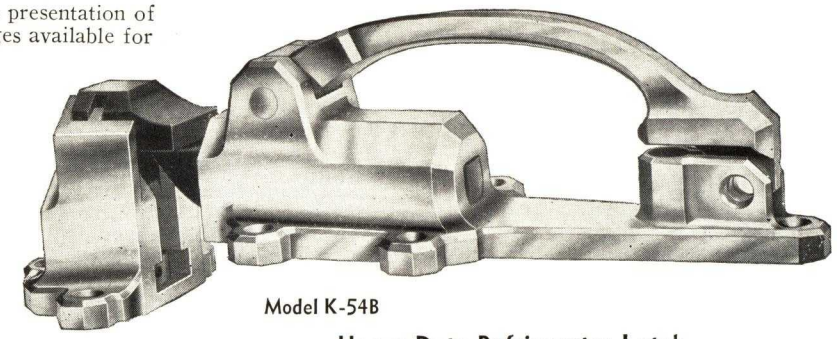


The Patented Micrometer Strike—This is a proved, practical device for making offset adjustments to align the body of the latch perfectly with its strike. A turn of the screw raises or lowers the strike in its socket to any desired height. Adjustments of hairline fineness can be made whenever desired to take up the natural play of the door or when the gasket becomes flattened, so that the door is always sealed air-tight with each simple operation of the latch.



Service Door Hinges

The model illustrated is available in two sizes—No. 1070A—5-in. strap and No. 1071A—6½-in. strap. Two other models for corresponding sizes are made with a narrow flange and without the case-hardened ball-bearing washer. All models are available in Forged-Brass and in all finishes and offsets. See catalog for detailed description and full-size illustrations.

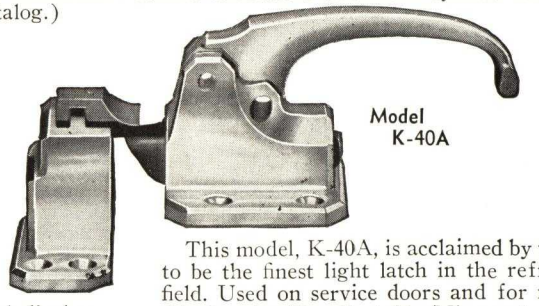


Model K-54B

Heavy Duty Refrigerator Latch

A massive latch of massive sealing power for duty on heavy refrigerator, cooler and freezer doors. Latch is 13 ins. over all and weighs 12 lbs. Available in all finishes. Inside release handle supplied. Equipped with adjustable Micrometer Strike. Latch can be padlocked at extreme right. Model K-48 A of the same design is 11 ins. over all, weighs 6 lbs. and is used for smaller walk-in doors.

Both models are also available with built-in cylinder locks. (See catalog.)



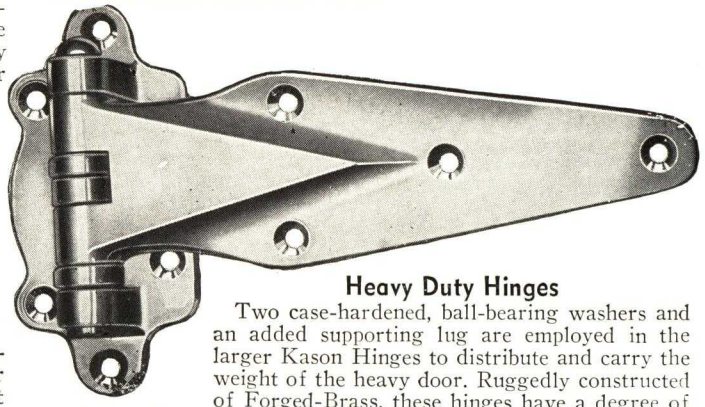
Model K-40A

This model, K-40A, is acclaimed by the trade to be the finest light latch in the refrigerator field. Used on service doors and for refrigerated display cases. Equipped with adjustable Micrometer Strike. Latch can be padlocked. Available in all finishes.

See catalog for other latches for refrigerator and freezer doors.

Kason Refrigerator Hinges

A complete line of Kason Forged-Brass Hinges from 5 to 22 ins. in length is presented in detail in catalog No. 38. The models below illustrate the basic design and mechanical construction of the line. Designed to match the Kason Latches, it is suggested that both Kason Latches and Kason Hinges be specified in combination to attain greatest ornamental value.



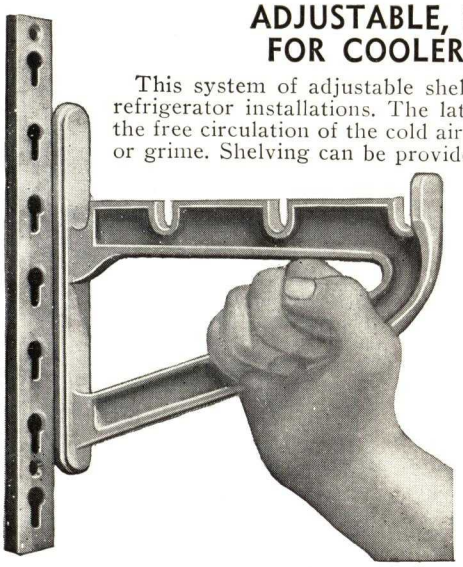
Heavy Duty Hinges

Two case-hardened, ball-bearing washers and an added supporting lug are employed in the larger Kason Hinges to distribute and carry the weight of the heavy door. Ruggedly constructed of Forged-Brass, these hinges have a degree of serviceworthiness far greater than severest service can ever demand of them. Available in all sizes, finishes and offsets. See catalog.

OTHER KASON PRODUCTS

Refrigerator Levers
Freezer Door Hardware
Cold Storage Door Hardware
Unlatching Bumpers
Butcher Rails
Reflectors
Dehydrating Tubes
Drain Traps

ADJUSTABLE, SANITARY SHELF-RACKS FOR COOLERS AND REFRIGERATORS



This system of adjustable shelving is highly recommended for all cooler and refrigerator installations. The lattice-style shelf is especially provided to permit the free circulation of the cold air around each article stored. Will not collect dust or grime. Shelving can be provided in any desired lengths and in widths varying from 9 to 18 ins. Shelf heights can be set as desired and can be easily changed whenever desired. The parts employed are specified below:

Keyhole Standards—Two types are available. No. 33 constructed of heavy steel 1 x ½ x ⅛ in. and No. 34 constructed of brass 1 x ⅜ x $\frac{1}{16}$ in.

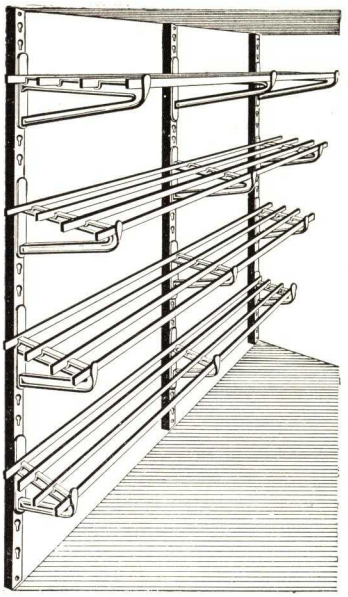
Brackets—Available in two metals—Brass and Malleable Iron and are stocked in the following sizes:

9-in. projection accommodates 4 rails
12-in. projection accommodates 5 rails
15-in. projection accommodates 6 rails
18-in. projection accommodates 7 rails

Rack Bars — Available in two metals — Rolled Steel and Brass.

Dimensions: 7/16 in. square. Cut to desired lengths.

Finishes: STEEL AND IRON: Kasonized (special electro-tinned), cadmium plated or galvanized. BRASS: Nickel plated and chromium plated.



Pilaster Standards For Making Adjustable Shelving

An inexpensive system of adjustable shelving is made possible with Kason Pilaster Standards No. 60 and the several styles of Clip Brackets illustrated. The Clip Brackets can be attached and detached in an instant, yet they will support a tremendous weight. Very easy to install and easily adjusted to meet the changing requirement of the user.

Clip Brackets for Pilaster Standards—The Clip Bracket shown on the pilaster illustrated is No. 61. This and No. 64 illustrated below are used for shelf supports. The other models are used to support wire trays in refrigerators or refrigerated display cases.

Specifications — *Size:* 13/16 in. wide, stocked in lengths from 18 ins. to 12 ft.

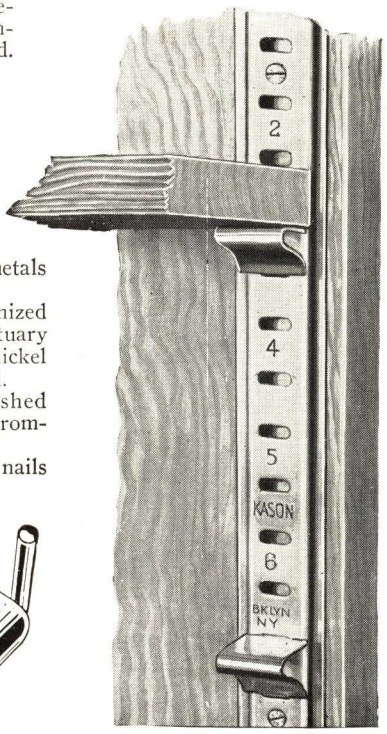
Adjustments: Shelves adjusted to the ½ in.

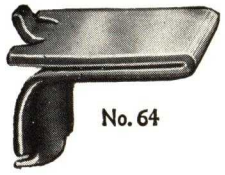
Made in the following metals and finishes:

Steel: Finished: Kasonized (special electro-tinned), statuary bronze, cadmium plated, nickel plated and chromium plated.

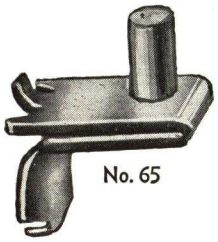
Brass: Finished: polished brass, nickel plated and chromium plated.

¾-in. screw-head type nails furnished.

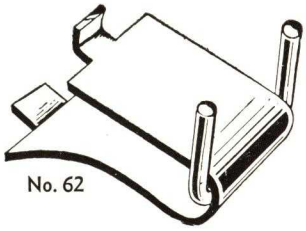




No. 64



No. 65



No. 62

AUTOMATIC CLOSER FOR HEAVY REFRIGERATOR DOORS

The design of a refrigerator is not complete until provision has been made for automatically closing the walk-in refrigerator door to eliminate costly refrigeration leaks resulting from the operator's carelessness. The Kason Automatic Door Closer is a simple, practical device especially developed for this purpose for the refrigerator industry which long service has proved to be perfect in every respect. This closer is very easily installed and can be adjusted to suit the requirements of every type of door.

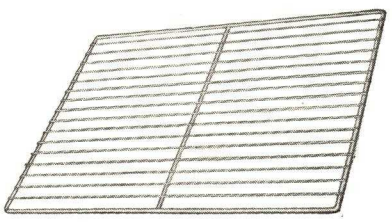
Made in two sizes:

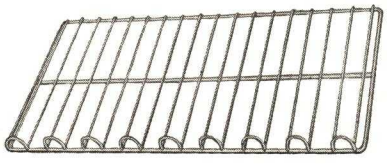
No. K-1095 for standard-size walk-in doors.
No. K-1096 for extra-heavy doors.
Size: 25 in. over all. Finish: tinned.
Installation instructions supplied with each closer.

KASONIZED WIRE TRAYS AND SHELVES

Kasonized Wire trays are not to be confused with the ordinary plated and tinned trays on the market. Kasonized Trays are plated and tinned by a special process which gives added protection against corrosion of the metal. Salt Spray laboratory tests have indicated that whereas ordinary hot-tinned and electro-tinned trays had broken down within a period of from 5 to 31 hours, Kasonized Trays remained perfect after 800 hours.

Kasonized Trays are made to order from specifications and blue prints.





Established 1897

MARKET FORGE COMPANY

Sanitary Metal Rack Equipment for Refrigerated and General Storage Rooms

EVERETT, MASS.

REPRESENTATIVES

ATLANTA, GA., Leo S. Bosarge, 315 Spring St., N. W.
BALTIMORE, MD., Edward J. Seager, Baltimore Life Bldg.
BUFFALO, N. Y., Howard T. Cary, 293 Voorhees Ave.
CHICAGO, ILL., Stanley Baldwin, 228 No. La Salle St.
CINCINNATI, OHIO, Arthur F. Dreyer, 3119 Beaver Ave.
CLEVELAND, OHIO, Carl Sprigade, Keith Bldg.
DETROIT, MICH., W. C. Rasch, 4612 Woodward Ave.
HOUSTON, TEX., D. C. Lingo Co., 1414 Fannin St.
KANSAS CITY, MO., F. H. Turner & Son, 919 Baltimore Ave.
LOS ANGELES, CAL., Warren & Bailey Co., 350 So. Anderson St.
MILWAUKEE, WIS., W. H. Reinecke, 759 No. Milwaukee St.
MINNEAPOLIS, MINN., H. O. Johnson, 4205 Garfield Ave., So.
NEW YORK, N. Y., L. W. Tracy, 152 W. 42nd St.
PHILADELPHIA, PA., E. F. Johnson, 220 So. 16th St.
PITTSBURGH, PA., Harry H. Frank, 209 Fulton Bldg.
ST. LOUIS, MO., Herbert Golterman, 717 Louderman Bldg.
SAN FRANCISCO, CAL., Phillips Refrigeration Products Inc., 141 Eleventh St.

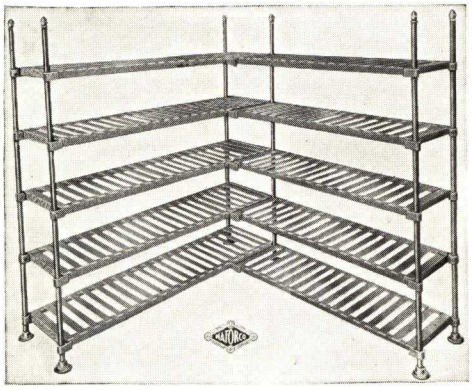
Refrigerator Storage Equipment

Walk-in shelving, reach-in shelving, hook rail racks, cork insulated baffles, bunkers, coil supporting racks, drawers and pans for all purposes, drip pans, fur storage racks and trucks, rug storage racks and trucks, mortuary racks and trucks, and flower storage and display racks.

General Storage Equipment

Trunk storage racks, picture storage racks, tapestry racks, silver storage racks, barrel racks, shipping room racks and trucks. Hotel, hospital and institutional storeroom shelving and trucks, standard metal partitions, linen room shelving and counters, coffin storage racks, metal tables, trucks, racks and skids for handling and storage of all kinds of material.

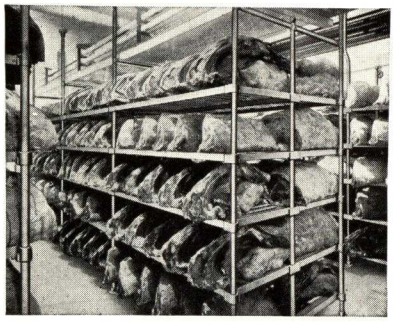
"MAFORCO" WALK-IN REFRIGERATOR EQUIPMENT



Typical Shelf Rack

Rigid and self-supporting, eliminating anchorage to refrigeration construction. This avoids puncturing of insulation and resulting disintegration. Racks are assembled without the use of bolts or nuts.

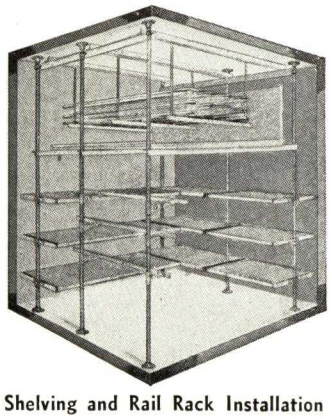
Rail rack posts are 1-in. standard pipe for light loads and 1¼-in. standard pipe for heavy loads. Rail brackets are of heavy gauge pressed steel, providing for flush mounting—3, 6, 9 and 12-in. projections from the face of the posts. Rails are 1½x⅜-in. steel for light duty and 2x⅜-in. steel for heavy duty. Posts should be set at a maximum of 5-ft. centers for light duty and 3-ft. 6-in. centers for heavy duty. Removable hooks should be provided for every 6 in. of rail. Posts are expanded between floor and ceiling. Rail brackets are adjustable and removable without moving the posts.



Typical Installation

All equipment is hot galvanized, except the hooks which are tinned. As an alternate, we recommend stainless steel.

Where wall coils occur, "Maforco" cork insulated baffles supported on shelf or rail rack posts are recommended. These are made of 1-in. sheet cork covered on both sides with galvanized sheet iron. When used in conjunction with stainless steel rack equipment, the exposed face should be covered with stainless steel. These baffles assist the circulation of cold air, making the refrigerator more efficient, protect food stuffs from the coil frosting and at the same time provide a stop at the rear of the racks.



Shelving and Rail Rack Installation

Standard Specification—"Maforco" Shelving

Posts are 1¼ in. outside diameter, high carbon steel tubing. Brackets are of malleable iron rigidly fixed to posts by means of setscrews to support shelves which are vertically adjustable and readily removable for cleaning. Shelves are made of high carbon steel angles in sizes to suit loads imposed, double riveted at the corners. Slats are 1 in. x 12-gauge, 1 in. apart, flush riveted to frames with all edges well rounded and chamfered. Slatted construction permits a free circulation of air. Shelf section should not be more than 6 ft. long. Posts are neatly finished at top with ornamental acorns and with suitable malleable floor flange. Shelf may be furnished perforated or of solid sheet metal, if desired.

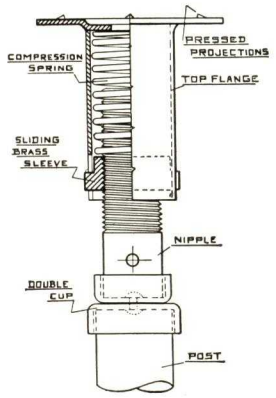
Unless otherwise specified, all equipment is to be furnished hot dipped galvanized after fabrication. As an alternate, we recommend stainless steel.

"Maforco" equipment conserves valuable refrigerated space. It fits snugly into corners and every inch of available space is utilized.

SANITARY REFRIGERATOR EQUIPMENT

"Maforco" Self-expansion Fitting

Due to nature of rack equipment required, it is not always possible to economically furnish self-supporting racks. In such cases, equipment must be supported on posts running from floor to ceiling. To avoid the necessity of attaching posts to the floor and ceiling, the "Maforco" self-expansion fitting, type No. 28, has been developed. It removes the possibility of damage to the interior finish of the refrigerator, at the same time providing an automatic adjustment to keep posts properly rigid at all times, due to their change in length resulting from changes in temperature. Ordinary types of fittings require adjustment and extreme care in the original installation. The "Maforco" self-expansion fitting eliminates these troubles. Once installed, no further adjustment is necessary.



Flange is fabricated from steel with pressed projections at the top to provide friction between the ceiling and the top of the flange. Inside of this flange is a compression spring held in place by a sliding sleeve or nut made of brass to prevent freezing at reduced temperatures. Nipple is of sufficient length to allow 1-in. adjustment either way. Connection with post is provided by means of a double cup construction of pressed steel.

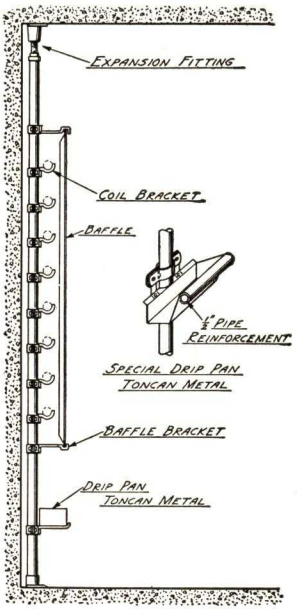
Be sure to specify "Maforco" equipment and where posts run to the ceiling insist upon the use of this No. 28 expansion fitting.

"Maforco" Wall Coil Supports

"Maforco" coil supports satisfy demand for a simple, economical method for supporting coils, at the same time avoiding puncturing of insulation, and use saves refrigerator space by making it possible to bring coils as close to the wall as practical. Coil brackets are furnished for 1¼, 1½ and 2 in. pipe posts to carry 1, 1¼, 1½ and 2 in. pipe coils. Special sizes are also available, if needed.

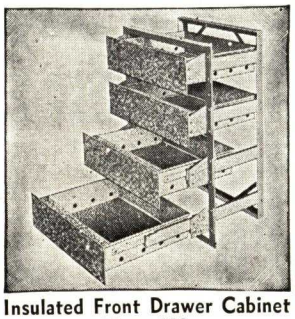
Posts are equipped with heavy duty floor flanges and standard "Maforco" type No. 28 expansion fittings. Same posts may be used to carry drip pan, plain or reinforcing type. Plain type is of 20-gauge Toncan metal. Reinforced type has ½-in. pipe reinforcing along the front edge. The same posts may also be used to support baffle brackets for "Maforco" baffles, if desired.

This construction does away entirely with unsightly built-in supports and through use of standard equipment avoids expensive special work.



"MAFORCO" REACH-IN REFRIGERATOR EQUIPMENT

Drawers operate on telescoping extension supports, permitting their full length withdrawal outside the front of the refrigerator, yet are rigidly supported in a horizontal position. Machined bronze wheels rolling on axles attached to the side of each drawer ride in hot galvanized telescoping channel construction. Channels in turn are attached to hot galvanized angle iron frames for support.



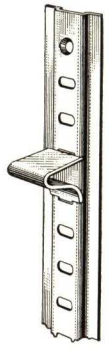
Insulated Front Drawer Cabinet Type 113

Drawers are insulated with 2 in. of sheet cork sealed in sheet metal. They are constructed of galvanized iron or stainless steel soldered watertight. Drawers are perforated in the sides for air circulation and are provided with perforated false bottoms where desired.

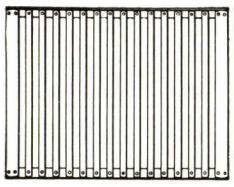
Drawer fronts are of heavy gauge galvanized steel plate to permit the attaching of wood face, gasket and hardware by others.

Reach-in shelving is of three main types: slatted, welded wire or perforated sheet metal. Slatted type is recommended in hot galvanized finish, welded wire type in tinned finish and perforated sheet metal type in galvanized or stainless steel. Supports are provided either with posts or angle frame construction as individual requirements warrant. For light duty installations, "Maforco" pilaster strips should be attached to the walls with clips to support shelves.

Unless otherwise specified, "Maforco" equipment is furnished hot galvanized. The only alternate we recommend is stainless steel.

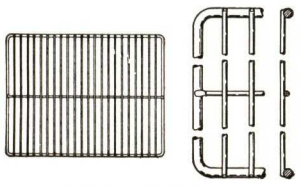


Ordinary types of pilaster strips are not sufficiently strong for general refrigerator work. Special types as shown developed by the MARKET FORGE COMPANY and made of extra heavy steel with heavy duty clips, provide rugged and strong support



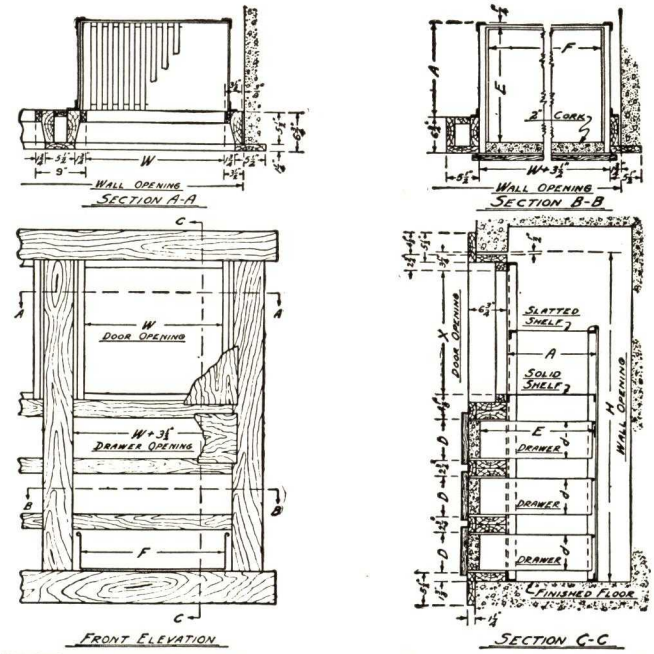
Slatted Shelf

Slats are 1 in. wide by 12-gauge 1 in. apart flush riveted to front angle with flange down and back angle with flange up. This construction provides a stop at the front and prevents food stuffs from being pushed off the shelf onto the floor



Welded Wire Shelf

Made with $\frac{5}{32}$-in. wires spot-welded 1 in. apart to ⅜-in. wire frames. Finished hot galvanized or tinned. Especially desirable where small shelves are needed



STOCK SIZES OF DRAWERS			
WIDTHS "F"	18⅞",	24⅞",	30⅞"
LENGTHS "E"	18",	24",	30"
DEPTHS "d"	4",	6",	8", 10"

Any combination of width, length, and depth may be had Special sizes made to order

$W = F - \frac{3}{8}"$ $\quad D = d + \frac{1}{4}"$ $\quad A = E - 4\frac{1}{2}"$

For drawers below with shelves above:—
$H = X + 6" + (\text{No. of drawers})(D + 2\frac{3}{8}")$

For all drawers:—
$H = \frac{1}{2}" + (\text{No. of drawers})(D + 2\frac{3}{8}")$

Standard Construction of Refrigerator Fronts to Fit Standard "Maforco" Cabinets

ALL-METAL INSULATED BUNKER EQUIPMENT FOR ALL TYPES OF REFRIGERATION

All equipment is adjustable and removable—a very valuable feature allowing ready access to refrigerating equipment repairing service. Expensive built-in work is entirely avoided and the use of hot-galvanized material throughout insures long life at the lowest cost consistent with economy.

Posts are of 1¼-in. iron pipe size rigidly expanded between floor and ceiling. Posts along sidewalls spaced approximately 6 ft. on centers.

Longitudinal angles "A" supported by angle bearing brackets carry heavy cross angles "B" through which are bolted hangers for lower angles "C" on which refrigerating equipment is supported. Threads on trapeze rods allow for liberal vertical adjustment.

Bunker pan is furnished as shown in section. Construction eliminates any possible sag between supporting angles. Bunker pans and baffles are carried on angles "D" resting on vertically adjustable brackets.

Adjustability of brackets and angles supporting bunker pan, provide necessary tilt for proper circulation.

Bunker pan is watertight and furnished with threaded outlet ready for attachment of drain pipe.

Width of bunker depends upon allowance for cold and warm air flues. We suggest a cold air flue allowing 1½ in. per ft. of cooler width and 1 in. per ft. warm air flue. This type of construction is just as suitable for double as for single bunkers.

For reach-in boxes the same construction may be used. Also the same posts may be used to carry "Maforco" shelving, thereby effecting a considerable saving.

Likewise same posts used for supporting the bunker pan construction in walk-in boxes are also used to support rail racks and shelving where specified.

Where available ceiling height permits it, always use overhead location of refrigerating equipment. This assists circulation and good circulation is one of the vital requisites of proper refrigeration.

For the finest installations specify stainless steel lined and covered "Maforco" bunker equipment.

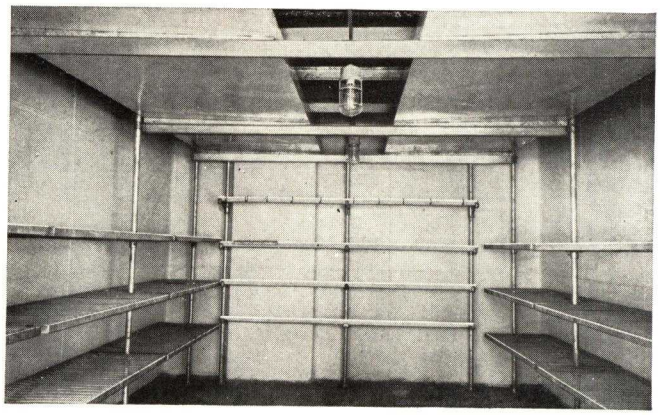
We suggest you specify "Maforco" bunker pan baffle board and coil support equipment as made by the MARKET FORGE COMPANY, Everett, Mass., wherever overhead coils are possible.

Consulting Service

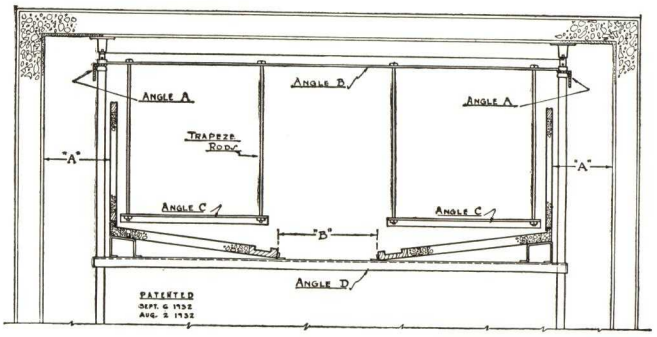
The MARKET FORGE COMPANY originated the use of all metal equipment for refrigerated storage space. Since 1897 we have been constantly improving and adding to our comprehensive coverage of this field. Our experience and knowledge enables us to proffer complete layout and specification service with no obligation incurred.

Refrigerator Specialties

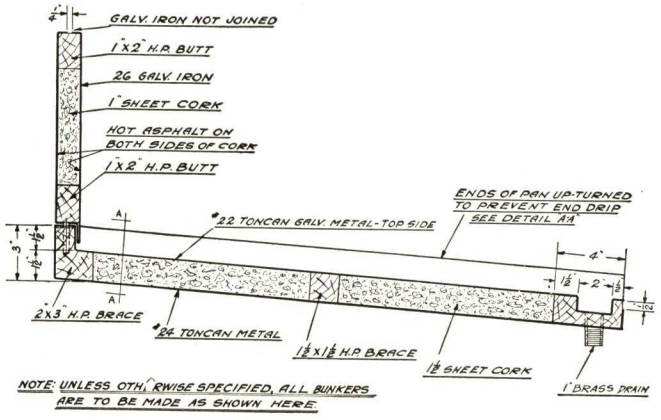
It is impossible to cover completely all the specialties we make or have made for this field. Box builders and refrigerator companies are invited to consult with us on any requirement whether or not listed or shown here.



Typical Installation



Section Through Double Bunker Pan, Baffle and Racks
"A"—1 in. per foot of refrigerator width
"B"—1½ in. per foot of refrigerator width

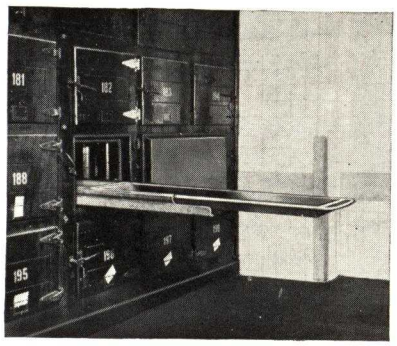


STANDARD CONSTRUCTION "MAFORCO" BUNKER PAN & BAFFLE FOR SINGLE OR DOUBLE CYCLE CIRCULATION
PAT. APPLIED FOR

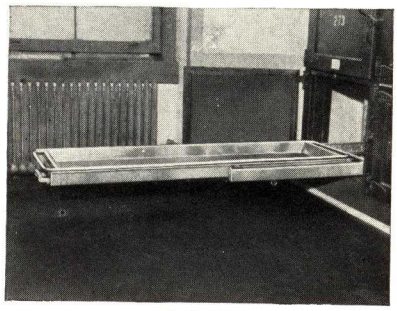
List of Recent Installations

Armour & Co., various plants
Swift & Co., various plants
Cudahy Co., various plants
Hudson County Medical Center, Jersey City, N. J.
New York State Hospital, various
U. S. Veteran Hospitals, various
U. S. Navy Hospitals, various
U. S. Marine Hospitals, various
Masonic Home, St. Louis, Mo.
Missouri State Penitentiary, Jefferson City, Mo.
Purdue University, Lafayette, Ind.
Indiana University, Indianapolis, Ind.
University of Michigan, Ann Arbor, Mich.
Rhode Island State Hospitals, various
Massachusetts State Hospitals, various
U. S. Indian Hospitals, various
U. S. Forts, various
Walgreen Company, Miami, Fla.
Childs Restaurant, various
Schraffts Restaurant, various
Waldorfs Restaurant, various
Longchamps Restaurant, New York City
Sherry Netherland Hotel, New York City
Waldorf Astoria, New York City
Girard College, Philadelphia, Pa.
Duke University, Durham, N. C.
Harvard College, Cambridge, Mass.

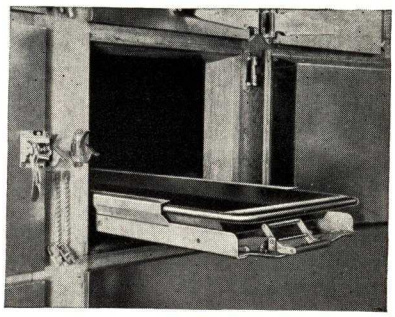
"MAFORCO" MORTUARY EQUIPMENT FOR HOSPITALS, MUNICIPAL MORGUES, MEDICAL SCHOOLS, ETC.



Style I



Style V



Illustrating Lock Handle

The proper storage of cadavers requires careful consideration for obvious reasons. Thoroughly sanitary conditions must prevail. Injuries to bodies must be avoided.

"Maforco" mortuary racks are the result of years of experience in this field.

Detailed Specifications for "Maforco" Mortuary Racks

Each rack is to consist of a tray mounted on a telescoping carriage operating in a steel bed frame. Tray is to be of 20-gauge galvanized sheet metal rolled over a one-piece hot galvanized pipe frame approximately 1-in. outside diameter. Tray is to be flared for easy cleaning and no rivets or bolts shall pass through the tray. Corners shall be loaded with solder scraped smooth.

As an alternate, we recommend the sheet metal part of the tray be of stainless steel. This is important because body acids stain galvanized steel.

Telescoping carriage shall be of especially formed steel channels with ball bearing wheels on each side and ball bearing steel rollers for the tray to roll upon. Channels shall be provided to serve as vertical and horizontal guides to keep tray in proper location. Front end of carriage is provided with trip handle and latch which automatically hold both the carriage and tray locked into place. This is a vitally important safety device normally overlooked. It prevents the possibility of accidental withdrawal of the tray with its subject. The steel bed shall have two ball bearing wheels at the front end on which the channel frame of carriage operates. Rear end of carriage and steel bed shall be suitably rubber bumpered to take the shock of tray and carriage, respectively.

Racks are so designed that the tray may be withdrawn entirely outside of refrigerator sustaining its load in a horizontal position without sagging. Carriage shall be provided with handle at end with stop attached at suitable location to permit extension to desired point, but the stop on the bed frame can be pivoted so as to permit removal of carriage.

All parts unless otherwise specified are to be hot galvanized after fabrication.

General Information

All mortuary racks are built in sizes shown. Carried in stock for immediate shipment. Refrigerator space should be built to conform with these sizes. Door width should not be less than 25 in. Vertical door opening normally 24 in., but not less than 18 in. Two-tier high installations are recommended because of ease of handling. Additional tiers are entirely practical, but necessitate the use of a tiering machine for operations.

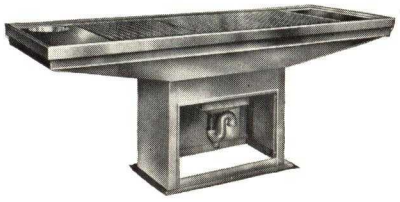
Styles No. I and No. II racks are identical, except as to method of rear support.

Style No. III rack is a double ended type which operates at either end, permitting installation of the morgue refrigerator between the receiving room and the post-mortem laboratory. This simplifies handling of cadavers, making them accessible from either room.

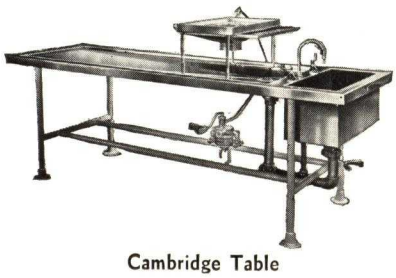
Style No. IV shows side-operating racks designed for space which does not permit the use of the end operating construction. This type of rack is to be used only where absolutely necessary, for it is not generally desirable because of the difficulty of handling.

Styles No. V and No. VI racks are recommended for municipal morgue use. They are essentially identical to Styles No. I and No. III, respectively, except that they are provided with an additional telescoping carriage, so that when the tray is completely extended, it has a support its entire length.

"Maforco" Autopsy Tables

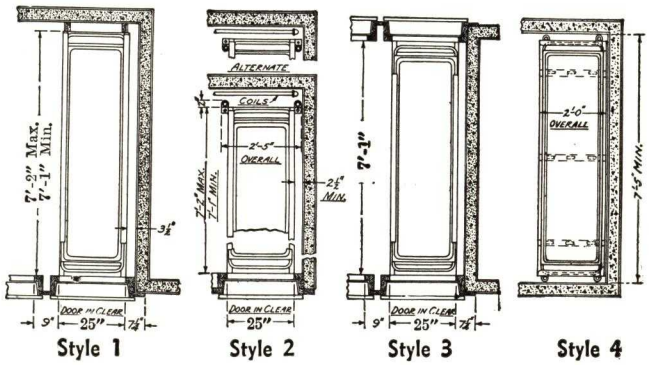


Concord Table



Cambridge Table

A complete range of designs and styles of autopsy tables. These products are the result of years of experience in this field. Write to factory for complete information.



Style 1 Style 2 Style 3 Style 4

Standard Dimensions

"Maforco" Mortuary Specialties

Trucks, tables, stands of all types for sundry morgue and pathological laboratory use. Write for details.

MARKET FORGE COMPANY

"MAFORCO" FUR AND GARMENT STORAGE RACKS

Providing Maximum Storage Capacity with Every Garment Readily Accessible and Protected from Damage in Handling

General Construction

Multiple Tier Installations

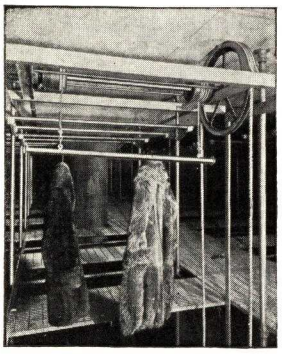
Centerpost construction made possible by the use of "Maforco" pressed steel for brackets. Provides for the utmost simplicity and economy of arrangement. Provides for low cost of equipment and installation. Allows for rearrangement or relocation to suit changing requirements. All parts neatly furnished for appearance and to avoid injury to garments. Care is taken to simplify work of loading and unloading garments. Parts are not attached to building construction but are planned to be essentially self-supporting. All equipment hot galvanized after fabrication. No other finish has proven so consistently satisfactory.

Two-Tier Installation

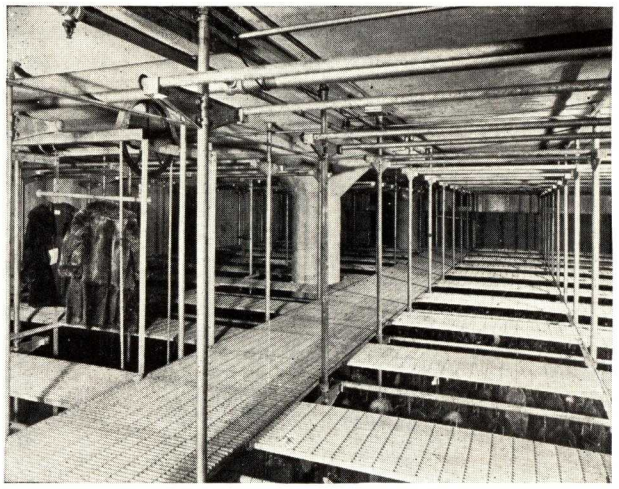
Access to upper tiers in multiple tier installations is provided for by means of ladder, stairs or spiral stairs. Walkways are provided in main and branch aisles. Care is taken to protect operators from danger. Garments are handled by means of manually or electrically operated hoists at convenient locations.

Consulting Service

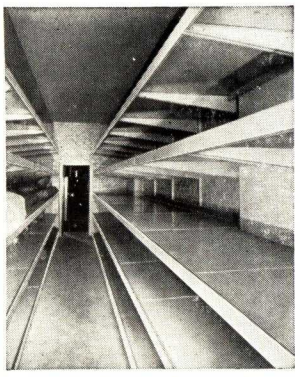
We suggest you consult us in connection with detail layout specification and budget work. There is no obligation. Space does not permit a complete coverage of all the ramifications of this field. Storage vaults may run from single tier spaces to five and six tiers high, involving stairway, walkways, hoists, etc. All other work within reasonable limits should be planned as accessory to rack layout. The true measure of the return on the entire investment is the storage capacity, in turn directly measured by the rack equipment available.



Hoist Installation



View from Upper Level Installation with Walk Ways



Installation for Rug Racks

A complete line of accessory and allied equipment is available, including garment trucks, muff racks, rug storage racks, packing tables. Write to factory for complete and detailed information.

Representative Installations

Revillon Freres, New York, N. Y.
C. C. Gunther's Sons, New York, N. Y.
Bloomingdale Warehouse, New York, N. Y.
Lincoln Safe Deposit Co., New York, N. Y.
Jordan Marsh Co., Boston, Mass.
Steigers Inc., Hartford, Conn.
Prine Cleaners, Ilion, N. Y.
Arctic Fur Co., Seattle, Wash.
Strawbridge & Clothier, Philadelphia, Pa.
Joseph Horne Co., Pittsburgh, Pa.
Morey La Rue Laundry, Elizabeth, N. J.
Paris Co., Salt Lake City, Utah
Alex Kessler Fur Co., St. Louis, Mo.
Bergdoff-Goodman Co., New York City
York City Laundry, York, Pa.
Sears Roebuck Co., Chicago, Ill.
Salem Laundry, Salem, Mass.
Goldblatt Bros., Chicago, Ill.
Merchants Transfer & Storage Co., Washington, D. C.
Clinton Trust Co., Newark, N. J.
Worcester Cold Storage Co., Worcester, Mass.
Parmalee Hall Furs Co., Omaha, Neb.
Jay Thorpe Inc., New York City
Irwin's, Cincinnati, Ohio
Balch Price & Co., Brooklyn, N. Y.
Kline's Inc., Kansas City, Mo.
Creed's Ltd., Toronto, Canada
Frederick & Nelson Co., Seattle, Wash.
Russek's, Brooklyn, N. Y.
Elite Laundry, Washington, D. C.

HEAVY DUTY SHELVING AND BINS FOR DRY AND BULK STORAGE

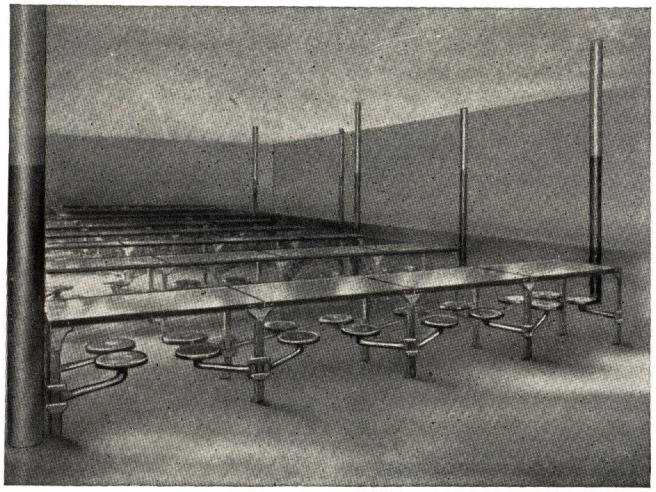
Storage shelving and bins in galvanized and enameled finish, especially designed for heavy duty work where ordinary sheet metal shelves soon fail. Shelving is completely sanitary and adjustable. Bins in all sizes for every purpose are completely verminproof and dustproof.

Typical Installation

The wide range of storage requirements makes it impossible to cover even the most popular types of this equipment. Consult the MARKET FORGE COMPANY with no obligation. We proffer a complete layout and specification service along with budget estimates.

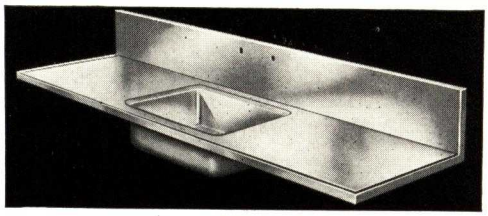
MESS HALL TABLES FOR INSTITUTIONS, PRISONS, SCHOOLS

All metal tables with permanently attached swinging seats are now being specified for all new building work and gradually replacing outmoded types of equipment. All stainless steel tops, verminproof construction, present a permanently fine appearance and simplifies cleaning problem.



Panicproof and riotproof design is a big feature of institutional installations. Designs as shown or "back-to-back" construction available in any general layout to suit conditions. We offer a complete layout and specification service.

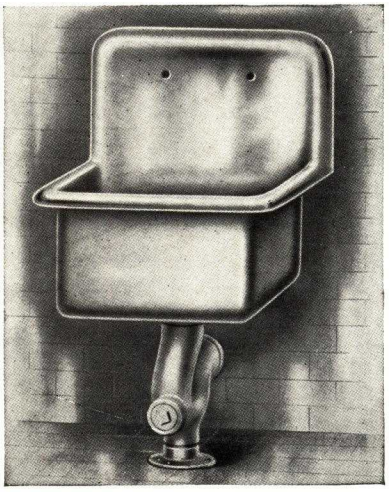
STAINLESS STEEL SINKS FOR EVERY PURPOSE



General Utility Sink

Stainless steel with its permanently clean bright finish is now the accepted standard of excellence for all general sink work. It is especially adapted to withstand the rigorous use and abuse given service sinks. All types and sizes available for every purpose. Write to factory.

All sinks are furnished with rounded corners, seamless welded, ground and polished, providing completely sanitary conditions. Layout and specification service available.



Service Sink

ESTABLISHED 1886

CHICAGO DRYER COMPANY

DOMESTIC-HILL LAUNDRY EQUIPMENT CO.

Manufacturers of Complete Laundry Room Equipment for Domestic, Hotel, Hospital, Institutional, School, Club and Industrial Requirements

EXECUTIVE OFFICES AND FACTORY
2210-2220 North Pulaski Road,
CHICAGO, ILL.
TELEPHONE Belmont 1060

EASTERN OFFICES
DOMESTIC-HILL LAUNDRY EQUIPMENT CO., INC.
(A. E. Morford)
5-33 48th Avenue, LONG ISLAND CITY, N. Y.
Telephone, Stillwell 4-5720

DISTRIBUTORS

BUFFALO, N. Y., George H. Drake Co., 218 Lexington Avenue
DETROIT, MICH., Frank C. Mack, 1500 West Fort Street
INDIANAPOLIS, IND., Hoover Brothers Co., 604 Majestic Building
LOS ANGELES, CALIF., Dawn Machinery Co., L. C. Schenck, 1317 East 17th Street
PHILADELPHIA, PA., J. F. Alexander, 1626 Wood Street
PITTSBURGH, PA., J. M. Webber, Dartmore Avenue, Overbrook
PORTLAND, ORE., E. R. Hayssen, 3116 N. E. Schuyler Street
ST. LOUIS, MO., Laundry Dryer & Heating Co., 123 No. 11th Street
SAN FRANCISCO, CALIF., M. E. Hammond, 557 Market Street
SEATTLE, WASH., Arthur A. Dally, 332 Pioneer Building
WEST PALM BEACH, FLA., Southern Metal Products, Inc., 505 Roseland Dr.

Chicago Gas Heated Laundry Plan

Making it possible for hotels, hospitals, institutions, etc., to install Laundry Equipment at advantageous installation and operation costs. Guaranteed by results of over 50 years' experience in this field.

CHICAGO
TRADE MARK REGISTERED

Co-operative Service

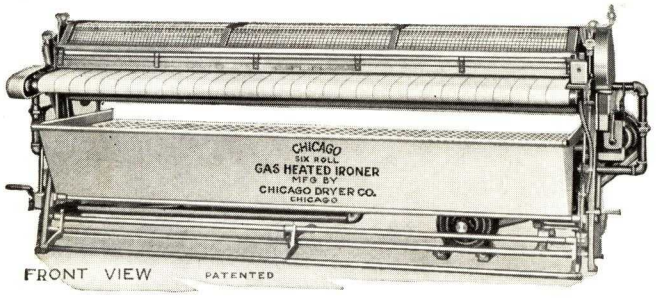
We invite architects and engineers to make full use of our Engineering Layout Service. We maintain a staff of Engineers, who will be pleased to assist in *planning* installations to meet requirements.

INSTITUTIONAL LAUNDRY EQUIPMENT

Gas and Electric Heated Production Type Flatwork Ironers, Cylinder Type Washers, Extractors, Tumblers, Trucks, Ironing Boards, Tables, etc. All equipment of the direct motor driven types.

Chicago Six-roll Gas Heated Flatwork Ironer With Motor and Blower Attached

Will maintain production capacities of from 300 to 900 lbs. dry weight flatwork per day. Will turn out higher quality flatwork at less cost per pound than any type of machine in its rated capacity. Eliminates necessity of providing high pressure steam.



Single thickness linens dried and ironed in one pass through machine. All rolls revolve, no wear on linens. Rolls compressed or raised from heated rolls instantaneously. Equipped with ribbon feed conveyor. Automatic safety stop finger guard approved by New York State Safety Commission. Hundreds of these machines now in service. Built in various sizes as follows:

Ironer No.	Contains	Occupies floor space	Motor, hp.
6—60	6 rolls 60″ long	40″x90″	½
6—80	6 rolls 80″ long	40″x110″	½
6—100	6 rolls 100″ long	40″x130″	½
6—120	6 rolls 120″ long	40″x150″	½

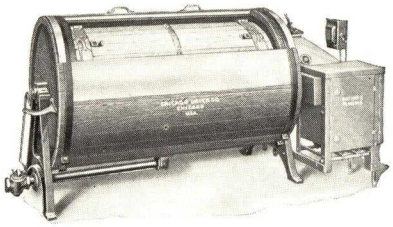
Provide 1-in. gas supply. The six-roll type may be supplied for electric heat in the following sizes: 75 and 100 ins.

Chicago No. 11-104 Gas Heated Flatwork Ironer With Motor and Blower Attached

Greatest production gas heated flatwork ironer built. Capacity up to 2000 lbs. and more dry weight per day. Contains 11 rolls consisting of 1 heated and 10 compression rolls measuring 104 in. in length. Motor 1½ hp. Occupies floor space 8 ft. x 11 ft. 6 ins.

Chicago-Direct Motor Driven Cylinder Type Washer

Operated by means of electric motor contained in housing. The direct unit drive attachment eliminates noisy and overhead line shaft; allows easy installation and economy in operation. Made with wood shell and wood cylinder. Brass trim.



Built in sizes as follows:

Type	Washer No.	Cylinder	Motor, hp.	Capacity, dry weight, lbs.	Occupies floor space
E.W.	3136	31″x36″	¾	50	46″x76″
E.W.	3152	31″x52″	1	75	46″x92″
E.W.	3652	36″x52″	1½	100	54″x100″
E.W.	4064	40″x64″	2	200	60″x126″

May be supplied with monel metal trim when so ordered, in which event they are designated as Type E.M.

Chicago-Direct Motor Driven Extractor No. 20 in. Type H.M.

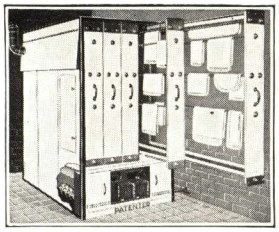
Basket measures 20 in. in diameter and is spun from extra heavy copper, tinned on inside and heavily reinforced to prevent bulging. Is supplied with safety cover interlocking device. Operated by means of 1½-hp. motor. Occupies floor space 30x56-in. Larger sizes can be supplied when so required.

Type GT Gas, Electric and Steam Heated Drying Tumblers

Equipped with inner cylinders measuring 36x30 in. and 36x42 in. Production capacity 70 and 100 lbs. per hour.

Open end type enables operator to load and unload while machine is in operation. Built in two sizes: 36x18 in. or 36x24 in. Production capacity 40 and 52 lbs. per hour.

CHICAGO CLOTHES DRYERS, WASHERS, IRONERS AND COMPLETE DOMESTIC LAUNDRY EQUIPMENT



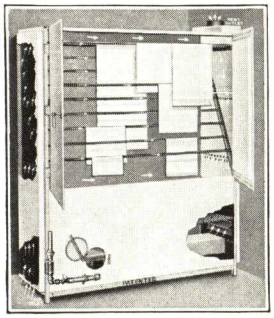
Chicago Clothes Dryers

Chicago dryers are built in all types and sizes to meet any requirement. Heated by means of gas, steam, electricity or coal stove attached. Gas heated types all equipped with indirect heating system. Burners contained within an interior drum. No exposed flame. Type S.C. as shown equipped with (type S.C.) self-contained racks eliminating overhead track system. Operates on ball bearings. Sturdy—no sagging construction. Built in following sizes:

Dryer	Dryer contains	Height	Length	Width	Hanging capacity
S.C. 296	2–9″ racks	6′–0″	6′	1′–9″	65 lin. ft.
S.C. 396	3–9″ racks	6′–0″	6′	2′–6″	97 lin. ft.
S.C. 3909	3–9″ racks	6′–10″	7′	2′–10″	117 lin. ft.
S.C. 4909	4–9″ racks	6′–10″	7′	3′–7″	156 lin. ft.
S.C. 5909	5–9″ racks	6′–10″	7′	4′–4″	195 lin. ft.
S.C. 6909	6–9″ racks	6′–10″	7′	5′–3″	234 lin. ft.
S.C. 7909	7–9″ racks	6′–10″	7′	6′–0″	273 lin. ft.
S.C. 8909	8–9″ racks	6′–10″	7′	6′–9″	312 lin. ft.

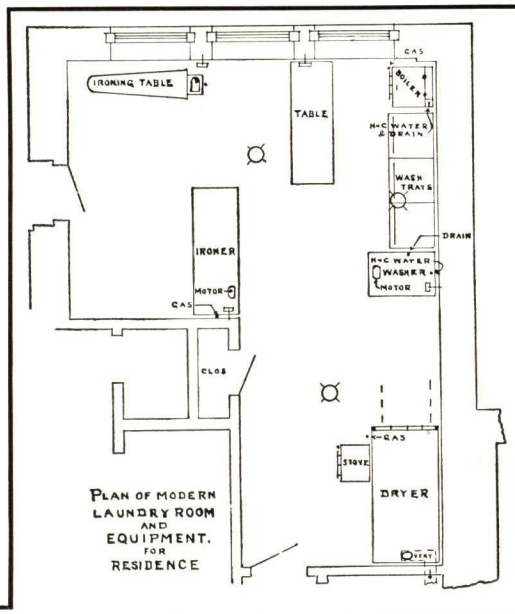
Height and length may be varied, when so required.

Cabinet Type



Chicago-Francis Gas Heated Cabinet Dryer here shown. We claim the most efficient heating and ventilating system ever devised. A popular dryer for small residential and apartment building installation. When installed in apartment buildings it is customary to supply one dryer to each set of laundry trays. Also made for electric or steam heat. Standard sizes as follows: built 6 ft. in height.

Dryer	Cabinet floor space	Hanging capacity
G-2060	20″x60″	60 lin. ft.
G-2460	24″x60″	70 lin. ft.
G-2480	24″x80″	95 lin. ft.
G-2680	26″x80″	115 lin. ft.



PLAN OF MODERN LAUNDRY ROOM AND EQUIPMENT FOR RESIDENCE

Chicago Three-roll Gas Heated Ironer

Construction and operation to give super-deluxe finish to flatwork, such as sheets, pillow cases, napkins, table linens, etc. Higher hourly capacity. Adaptable for residence and small institution requirements. Contains 3 rolls—namely, one heated and two compression rolls. All rolls revolve. No wear on linens. Approved by Good Housekeeping Institute.

Made with atmospheric gas burner or burner with gas blower attachment in the following sizes:

Ironer	Length rolls	Outside dimensions	Motor, hp.	Type of burner
3-50A	50″	28″x75″	¼	Atmospheric
3-50B	50″	28″x75″	⅓	Blower att.
3-60A	60″	28″x85″	¼	Atmospheric
3-60B	60″	28″x85″	⅓	Blower att.
3-75B	75″	28″x100″	⅓	Blower att.

Equipped with automatic safety stop finger guard approved by New York State Labor Safety Commission.

No. 3-50 and 3-75 sizes also made for electric heat. Three heats. Heaters made for operating on 230 volts only.

Stationary Clothes Boiler

Copper or monel metal equipped with water supply, drain and overflow fittings. Heated by gas.

Ironing Boards

Equipped with overhead suspension arm, pilot light, sponge cup and other novel fittings.

Chicago Electric Washer and Safety Wringer

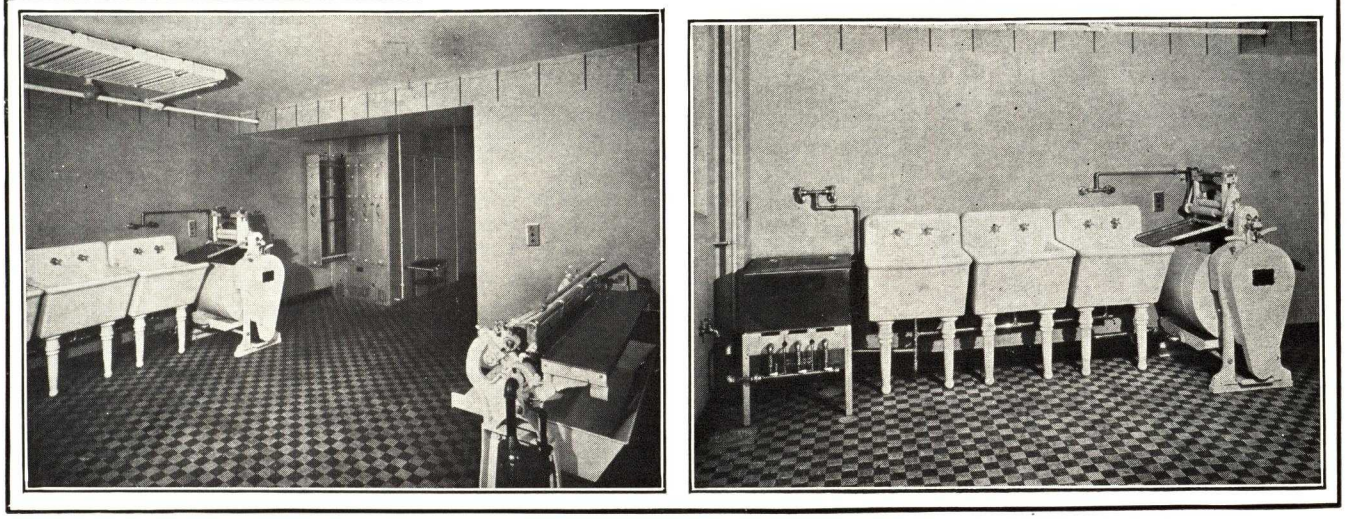
Extra large capacity for residences or small institutions. Exclusive features include automatic safety stop on wringer. Prevents tearing of clothes and insures absolute protection against possible accident to operator. Washer tub made of copper with nickeloid plating on inside. Equipped for stationary water and drain connections. 14-in. wringer. Approved by Good Housekeeping Institute.

Washer	Tub capacity, dry weight	Washer tub measures
214	15 lbs.	26″x18″
314	20 lbs.	26″x21″
414	25 lbs.	26″x24″
515	30 lbs.	26″x27″

Nos. 414 and 514 sizes also supplied with monel metal tub, when so ordered.

Other Products

Include laundry tables, laundry stoves, lawn (outdoor) dryers, starch cookers, etc.



Typical Residential Laundry Room Showing Installation of Chicago Electric Washer, Three-Roll Ironer, Clothes Dryer, Stationary Gas Heated Clothes Boiler, etc.

TROY LAUNDRY MACHINERY DIVISION

AMERICAN MACHINE AND METALS, INC.

Manufacturers of Complete Laundry and Dry Cleaning Equipment for Commercial and Industrial Laundries, Hospitals, Sanatoria, Hotels, Dry Cleaners, Schools and Clubs

EXECUTIVE OFFICES
100 Sixth Avenue, NEW YORK, N. Y.

BRANCH OFFICES

BOSTON, MASS., 248 Bolyston St.
CHICAGO, ILL., 35 E. Wacker Drive
EAST MOLINE, ILL.
LOS ANGELES, CAL., 767 E. Washington St.
SAN FRANCISCO, CAL., 1201 Folsom St.
SEATTLE, WASH., Eighth and Harrison Sts.

PRODUCTS

Motor or Belt Driven Metal and Wood Washers; Extractors; Tumblers; Ironers; Presses; Dry Rooms; Starch Equipment; Blanket Napping Machines; Dampeners; Curtain Equipment; Electric Irons; Tables; Trucks; Tubs; Dry Cleaning Equipment; Stills; etc.

THE COMPANY

Manufacturers of quality commercial laundry equipment for more than half a century. Builders of many of the largest laundry installations in the world. Factories at East Moline, Ill., located to best serve the industry. Eighty-three acres of model plant facilities. All products fully guaranteed.

TROY ADVISORY SERVICE

Troy maintains an advisory service which will aid you in planning, laying out, estimating or preparing specifications for institutional and commercial laundries of any size or type. Troy offers this service without charge.

DESCRIPTION

Washers—Monel metal machines in 24 in., 30 in., 36 in., 42 in., 44 in. and 54 in. diameters built in all standard pocket combinations and lengths, in direct motor drive and elevated header belt drive.

Metal washers are furnished in "Minute-Man," "Atlas," "Unit" and "Balanced" drives; also in "Premier" and "Titan" models.

Wood washers available in "Star," "Spartan," "Titan" models.

Wood washers in 30 in., 36 in., 42 in., 44 in. and 54 in. diameters furnished in all standard pocket combinations and lengths in direct motor drive and elevated header belt drive.

Extractors—Underdriven, open-top types with oscillating or non-oscillating curbs with copper or monel metal baskets, manufactured specifically for hospital laundry purposes in 18 in., 20 in., 26 in., 30 in., 40 in., 48 in., 60 in. and 72 in. diameters.

All machines furnished in motor drive. 20 in., 26 in. and 30 in. sizes also available in belt drive.

Available in Troy "Minute-Man," "Marathon," "Solid Curb," "Mercury," "Wizard" and "Centerslung" types. Also in "Olympic" unloading type.

Tumblers—Once-through, up-draft, or recirculating type tumblers to fit every commercial laundry requirement.

Available in 30 in., 36 in. and 42 in. diameters in all standard pocket combinations and lengths, in motor and belt drives, in "Minute-Man," "Premier" and "Trojan" types.

Ironers—Steam heated machines in "Chest" and "Cylinder" types, designed to meet every laundry production and quality problem. Chest types available in one, two, four, six and eight chest combinations, in all standard lengths. Machines furnished in motor and belt drives in Troy "Handy" and "Standard" types.

Cylinder types available in single and double cylinder combinations in 16 in., 24 in., 30 in. and 48 in. diameters and in all standard lengths. Machines furnished in motor and belt drives.

Presses—All wearing apparel and shirt presses—manually and pneumatically operated. "Trojan" air presses and "Minute-Man" foot presses. All models.

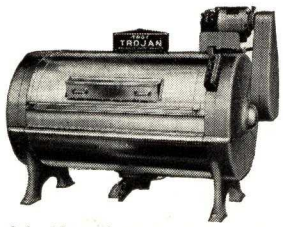
SAFETY FEATURES

All machines are equipped with full safety devices.

TROY
LAUNDRY MACHINERY

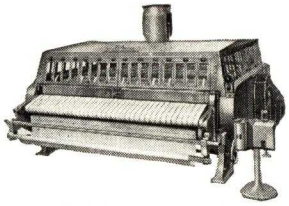
LITERATURE

Blueprints; floor plans; latest catalogues and circulars furnished you on request.

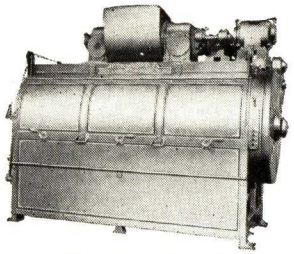


36, 42 and 54-in. Balanced Drive Washer

40 and 48-in. "Mercury" Extractor



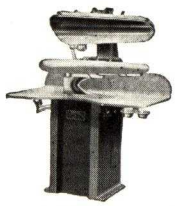
"Big 8" Flatwork Ironer with Canopy



42-in. "Premier" High Thermal Tumbler

24 and 36-in. "Trojan Minute-Man" Washer

Model 40-B "Minute Man" Foot Press



Model 38 "Trojan" Pneumatic Press

30-in. "Marathon" Extractor

UNITED STATES HOFFMAN MACHINERY CORPORATION

Complete Laundry Equipment Service for the Institution

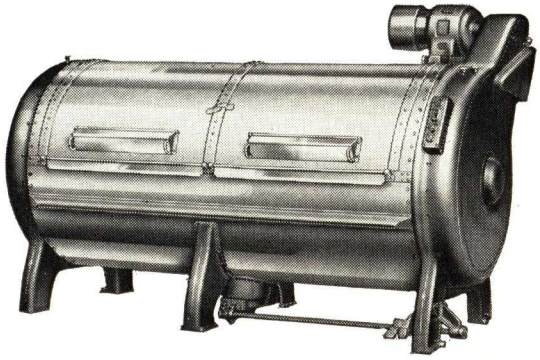
107 Fourth Avenue, NEW YORK, N. Y.

ORGANIZATION AND PRODUCTS

The UNITED STATES HOFFMAN MACHINERY CORPORATION has had wide experience in the manufacture of a diversified group of machinery products. This company has been known for over thirty years as the originators and largest manufacturers of steam garment pressing machines; Hoffman presses are used throughout the world.

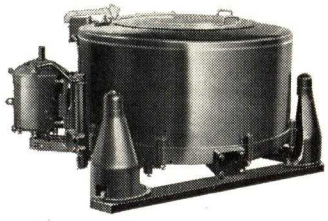
Hoffman miniature steam boilers lead all others in number of sales; Hoffman centrifugal blowers find many uses throughout industry. Hoffman is the leading manufacturer of heavy duty industrial vacuum cleaning equipment.

Hoffman builds a complete line of laundry machinery. Each Hoffman machine is designed for maximum output of high quality work at lowest operating expense per pound of linen. The line has been modernized and expanded and includes machinery built especially for the institutional laundry.



NEW—Hoffman Monel Metal Laundry Washers Specially Built for the Institutional Laundry

Extractors—20 to 72 Inches Basket Diameter

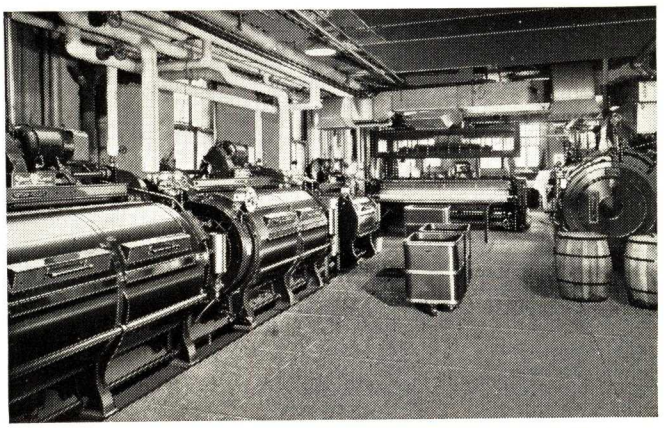


All of these products are designed and built in the modern Hoffman factory at Syracuse, N. Y., by skilled engineering and production staffs carefully trained in the Hoffman tradition of uniformly high quality. The high performance standards set by Hoffman equipment are well known.

3-FOLD EQUIPMENT SERVICE

Out of its 33 years of service the Hoffman organization offers a 3-fold equipment service which embraces

1—Finest equipment, dependable operation
2—Skilled servicemen located in 35 cities
3—Engineering service for laundry planning



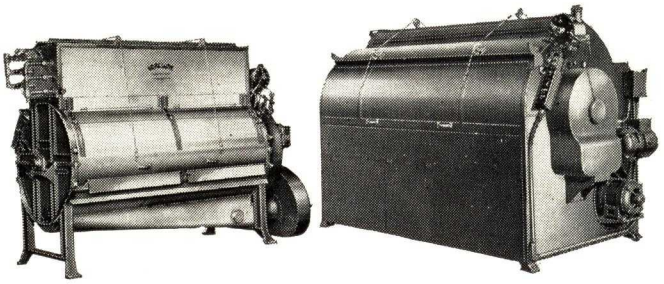
100% Hoffman-Equipped means 100% Operating Efficiency

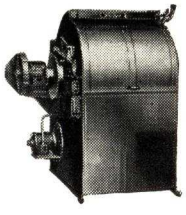
Hoffman is unusually well equipped to consult with architects and engineers in the planning of hospital or other institutional power laundries.

ASSISTANCE TO ARCHITECTS

Selecting the proper equipment to insure maximum output and lowest operating expense in the institutional laundry—and laying out the floor plans to utilize the space to best advantage—is an engineering application project which involves a close study of the requirements. Hoffman Engineers are well equipped to undertake this study in collaboration with the architect or consultant. Experienced engineers are available to survey the present facilities at the institution; modernized laundry layouts will be furnished gladly without charge. Full details as to floor space requirements, productive capacity, installation data, etc., are immediately available.

Unfortunately, space limitations prevent a presentation of these data in this page. However, a call to Hoffman will speedily bring a competent engineer who will assist in all details of laundry planning. If desired, he will furnish complete plans and specifications for the entire laundry machinery project.





Hoffman Tumblers feature the "Dry-By-Air" principle; produce soft-textured, odorless work. Bath towels dried in Hoffman "Dry-By-Air" Tumblers are soft, fluffy and absorbent.

GENERAL PORCELAIN ENAMELING & MFG. CO.

4127 Parker Avenue, CHICAGO, ILL.

NEW YORK OFFICE: 122 East 42nd Street

VERIBRITE LAUNDRY CHUTES

General—Chutes are made in 4 standard sizes, 12, 18, 20 and 24-in. diameter.

Veribrite Laundry Chutes (Linen Chutes, Clothes Chutes) are vitreous glass enameled over their entire surface, inside and outside. 18-gauge steel is our standard. Heavier steel may be employed if for any reason it is desirable.

Specifications

(1) Tube—Chute to be made of 18-gauge vitreous enameling steel (state diameter). Seam of each section to be welded and ground smooth before enameling. Chute to be made in sections of suitable lengths to meet building requirements. Section ends (A) to be flanged outward 1 in. and the joint made by bolting through flanges with a rubber gasket between. Joints to be watertight and rigid. No rivets to be used.

(2) Intakes—Intake throats (B) of same material as the tube, to be welded to the tube (C) forming an integral part of chute proper and grooved (D) downward in direction of travel.

(3) Intake Doors—Solid polished cast aluminum door and frames (E) located approximately 4 ft. above floor. Door equipped with refrigerator type latch and provided with rubber cushion gasket (F) to seal water and smoke tight when closed. Hardware chromium plated.

For asylums and institutions, doors equipped with keyed locks will be furnished. Lock doors may be master-keyed with the building hardware.

(4) Outlet—Elbow 90°, (G) of same diameter as chute fitted with cast aluminum door of same design as intake doors and having a 2-in. brass drain connection with strainer, (H).

or—chute to terminate in straight run with open end

or—chute to terminate in straight run with automatic fire door Type "F"

or—to terminate in 45 elbow or otherwise as desired.

(5) Top Cover—A disc (M) made of same material as chute having a 3-in. standard pipe thread nipple in center. Nipple (N) held in place by lock nuts.

(6) Flushing Ring—A ¾-in. copper perforated ring (P) to be installed near top of chute provided with a ¾-in. standard pipe nipple for connection to water line.

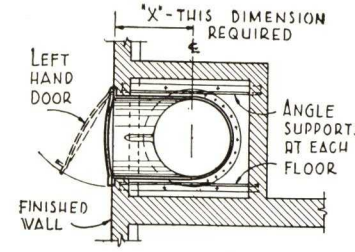
(7) Sterilizing—A 1-in. pipe coupling (Q) entering chute for connection to steam line. (This is not a standard fitting and will be furnished only when specified.)

(8) Supports—At each floor chute to be supported and stayed by 4 hanger rods (R) suspended from two angle irons (S) resting on floor slab. Bottom support to consist of steel cradle (T) pipe leg (U) and floor flange (V).

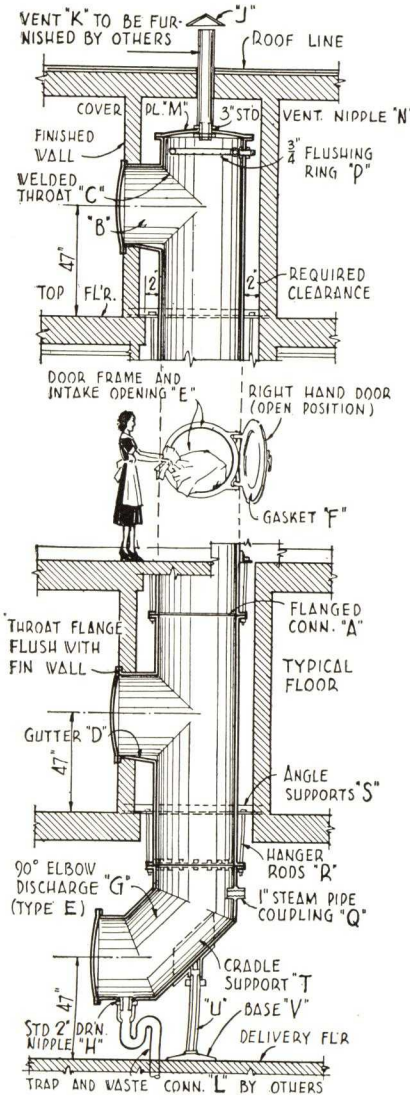
(9) Work Not Included—Ventilators, (J) Vent Pipes, (K) Water or Sewer (L) pipes or the connection of same to the chute.

(10) Hatch should be square, at least 4 in. larger than diameter of chute. Enclosing walls should not be erected until chute is in place.

(11) Note—Tables, troughs, receptacles for use at chute outlet are regularly constructed to meet individual requirements.



PLAN AT THROAT



VERTICAL SECTION

ALUMINUM LAUNDRY CHUTES

To be built of 16 B&S-gauge aluminum plates rolled to diameter required (state diameter), vertical seam lock joined. Section joints made by telescoping upper into lower section and bolting them together through angle lugs, welded on.

Remainder of specifications same as paragraphs 2 to 8, inclusive, of Veribrite Laundry Chute specifications.

VERIBRITE RESIDENCE LAUNDRY CHUTES

A glistening clean vitreous glass enameled chute for disposal of domestic soiled linens. Size, 12 in. diameter.

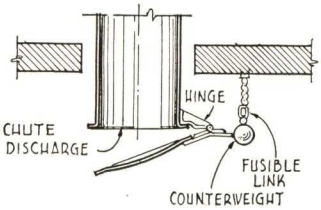
Made on exactly the same Veribrite specifications as above, except furnished with lighter polished aluminum doors and not provided with flushing ring, vent or drain connection unless called for.

VERIBRITE WASTE CHUTES

Also Termed Dust Chutes, Rubbish Chutes, Etc.

Considering the nature of materials handled, it is our belief that hospital waste chutes should be as inherently sanitary as possible. Therefore, we recommend the use of glass enameled Veribrite Chutes for this purpose. In high buildings (6 floors or over) where there is likelihood of back draught from the chute, it may be equipped with our double hopper type intakes which close off the chute when the door is opened. In buildings of less height, the standard Veribrite Laundry Chute will give perfect service.

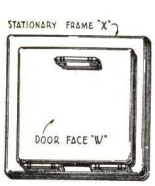
As a standard accessory for all waste chutes, we recommend the installation of automatic sprinkler jets. These are placed in recesses in the chute wall. Normally one at the top and one above the bottom outlet would suffice. Any desired number can be provided.



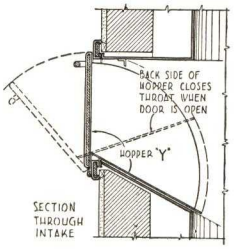
TYPE "F" OUTLET

Specifications

Same throughout as specifications of Veribrite Laundry Chutes, except the following if hopper type intake is desired.



FRONT VIEW HOPPER DOOR



SECTION THROUGH INTAKE

Door sizes:	W	H	Chute Diam.
	10 in.	12 in.	12 in.
	16 in.	24 in.	18 in.
	16 in.	24 in.	20 in.
	22 in.	24 in.	24 in.

Hopper Type Intake

Specification—To be in form of a "V" bucket with sides closed, to be hinged at bottom and to open downward. To be so constructed that when door is opened the hopper bucket effectually closes off the chute proper and prevents back draught.

Material—Door frame (X) polished cast aluminum. Face of door (W) polished sheet aluminum. Hopper (Y) 14-gauge galvanized iron.

Aluminum Waste Chutes

Cylindrical—Aluminum laundry chute specifications apply, except that throats are riveted to the tube. Hopper type intakes optional.

Square or Rectangular—Sizes, any dimensions desired. Section ends flanged outward and bolted together. Hopper type intake. Outlet as desired. Throats riveted to tube.

Galvanized Iron Waste Chutes

Specifications same as for aluminum waste chute with following exceptions: material 16 or 14-gauge (state which) galvanized iron.

Garbage Chutes

Same specifications as Veribrite Waste Chute with hopper doors.

HASLETT CHUTE AND CONVEYOR CO.

GENERAL OFFICES AND FACTORY
OAKS, PA.
SALES OFFICES IN THE PRINCIPAL CITIES

PRODUCTS

ALUMINUM CLOTHES CHUTES; SPIRAL PACKAGE CHUTES; STEEL RUBBISH CHUTES; SPIRAL and TUBULAR FIRE ESCAPES; ROLLER GRAVITY CONVEYOR.

Power Driven Conveyors for Package Handling, consisting of Belt, Slat, Pusher Bar and Vertical Lift Types.

Catalogs sent upon request.

ALUMINUM CLOTHES CHUTE

Tube—Furnished in four standard diameters, 12, 18, 20 and 24 in. Built of 16-gauge (B&S) aluminum plate rolled to Haslett standards for linen chute construction. Vertical seams lock joined, horizontal seams slip joined, all seams leakproof. No exposed rivets inside of tube.

Intake Throats—16-gauge (B&S) aluminum plate welded to tube, forming an integral part of chute. Throats to have sloping groove in bottom for drainage.

Tube Cap—Flat aluminum plate with collar for 3-in. standard vent welded to center.

Supports—Outlet supported by structural steel strut from foundation. Tube supported at each floor by aluminum straps welded to tube and bolted to steel angle frame.

Flushing Ring—¾-in. copper flushing ring provided with tee for water connection.

Intake Doors—Solid cast aluminum doors and frames located 4 ft. to center above floor, and having polished satin finish. Doors and frames have flat surface with concealed hinge lugs and coil springs. Cast brass chromium plated T-handle is set in well in door. No projections beyond face of door frame which is flush and sets ¼ in. from finished wall.

Outlet—90-degree elbow same diameter as chute, 16-gauge (B&S) aluminum plate welded into single unit, encased in 14-gauge steel, equipped with standard 2-in. cast iron flange for drainage connection. Satin finished cast aluminum door, with rubber cushion and self-latching lever and two extra cam type levers for use when chute is being flushed. All hardware chromium plated.

Work Not Included—Vent, flushing and drain connections. Foundations and openings through floors. Enclosing walls not to be constructed until chute is erected.

Recommendations—*For residences*—12-in. diameter chute with 12-in. diameter intakes.

For hospitals, hotels, etc. 24-in. diameter chute with 18-in. diameter intakes.

STEEL RUBBISH CHUTE

Rubbish chute with positive acting gear and cam interlocking door hoppers.

Stack—14-gauge steel, all seams flanged out and riveted. Standard sizes 22, 28, 34 and 46 in. square.

Cap—14-gauge steel with collar for vent.

Interlocking Door Intakes—Hoppers and door 14-gauge steel, welded construction. Intakes have two doors, one through which rubbish is placed in hopper and other opening into stack. Doors connected to operating handle by interrupted cut tooth gears and cams, so that one door is securely locked in closed position, while other opens and closes.

Sprinkler Protection—Accessible recesses for sprinkler heads provided where required. (For average chute locate one at top of stack.)

Outlet—90 degree elbow, 12-gauge steel sides and ¼-in. plate bottom. 12-gauge steel hinged door with heavy double latch. Elbow and door reinforced with angles.

Supports—Elbow supported by structural steel strut from foundation. Stack carried and stayed at each floor by angles across floor opening.

Painting—One shop coat.

Work Not Included—Vent, sprinkler appliances, field painting; foundations and openings through floors. Enclosing walls not to be constructed until chute is erected.

FIRE ESCAPES

Spiral Fire Escape

Housing—60-in. diameter with ventilated conical top, all of No. 16 gauge blue annealed steel, except the first 24 in. which is No. 12 gauge.

Trough—28-in. wide, concave sliding surface made of No. 16 gauge galvanized steel, securely riveted to housing and bolted to 3-in. diameter standard weight steel pipe core.

Entrance Bonnet—Made of No. 16 gauge blue annealed steel with sloping bottoms, tangent to the spiral shell. Wall opening to be 36-in. wide by 42-in. high at floor level and to be closed with double leaf doors, made of built-up ply wood cores. Doors to release upon slight pressure and open into bonnet.

Outlet—Double leaf steel doors equipped with kick plate which opens on contact with descending person.

Painting—All material except galvanized sliding surface to be given one shop coat of aluminum paint.

Larger Size—84-in. diameter with 40-in. wide trough. Entrance doors 42 in. wide by 42 in. high for use of disabled persons on mattresses.

Tubular Fire Escape

Tube—30-in. diameter made of No. 16 gauge blue annealed steel. All units are completely shop welded and hot dip galvanized after fabrication.

Entrance—Same as for spiral fire escapes as noted above.

Discharge—Easement section is to be a transformation from 30-in. diameter to an oval discharge 30-in. wide by 36-in. high, complete with steel pedestal imbedded in concrete foundation at grade. Bottom of discharge to be 15 in. above grade.

Conditions—Sections are fastened by means of angle rings welded to each end on each section and fastened together in field to make a watertight joint. Tube connections are slip joints with sliding surface in direction of travel.

Supports—Tube is to be adequately supported by supports or brackets at intervals of not more than 12 ft.

Painting—All material is to be hot dip galvanized after fabrication. No other painting necessary.

Larger Size—36-in. diameter for use of disabled persons on mattresses.

All fire escapes to have approval of Underwriters' Laboratories, Inc. We quote either on complete installations including building alterations and foundations or on material freight allowed destination.

SPIRAL CHUTES

Haslett Type Spiral Chutes—The Haslett type spiral chute has been developed to handle all classes of merchandise but particularly the unusual class, such as barrels, wire strapped crates or boxes, baskets of glass products, very light or very heavy merchandise weighing up to 2000 lbs.

The structural framing is designed to carry the loads and relieve sheet metal sections from shock and stress. The sheet metal acts only as a guide to merchandise traveling in the trough and the structural frame transmits the load to the center column, which distributes the load to each floor.

Core Type Open and Housed Spiral Chutes—The core type spiral chute is built to handle the general run of wrapped merchandise, cartons and relatively light wooden boxes. It is especially adapted for handling packages from wrapping or shipping departments intended for parcel post, express or local delivery shipments. These chutes are adapted to multistoried buildings where initial processes originate in the upper floors and work downward.

GRAVITY ROLLER CONVEYOR

The gravity roller conveyor is applicable in all types of industry. It can be bought in standard units and set up by the purchaser.

Send for detailed catalog.

POWER DRIVEN HORIZONTAL, INCLINED AND VERTICAL CONVEYORS

Conveyor installations must be engineered to suit individual requirements. We are prepared to advise and quote according to your needs. Consult us regarding package handling problems.

NESSLER MFG. COMPANY

Laundry and Waste Chutes
201 No. Wells Street
CHICAGO, ILLINOIS

GLASS ENAMELED, ALUMINUM, ARMCO IRON PAINTED LAUNDRY AND WASTE CHUTE SPECIFICATIONS

Note: This same specification applies to Welded Armco Iron Chutes, except that in (1) (2) Glass Enameled is omitted and chute is painted one coat of metallic paint inside and out.

(C1) General

Furnish and install where indicated on plans (one (1)) (specify number) Standard Glass Enameled Laundry Chute(s) (12-in.) (18-in.) (20-in.) (24-in.) inside diameter as manufactured by the NESSLER MFG. COMPANY, Chicago.

(C2) Materials and Construction

The entire area of chute, both inside and outside, shall be surfaced with Glass Enamel fused into the metal. Chute shall be made of 18-gauge Armco Ingot Iron with all seams welded and ground perfectly smooth before enameling. No rivets shall be employed. Chutes shall be made in suitable sections to meet building requirements. Sections shall be flanged at the ends and joined together securely with cadmium plated bolts. Provide flat rubber gasket between all joints.

(C3) Door Throats

The throat sections to which service doors are attached shall be welded to and form an integral part of the chute proper. They shall be of lengths required on plans to bring the door frames flush against the finished wall. Each throat shall be made with a groove in the bottom side sloping downward in the direction of travel to insure prompt drainage when the chute is flushed.

Note: Throats are 18-in. diam. on 24-in. size, 20-in. and 18-in. sizes, and 12-in. diam. on 12-in. size.

(C4) Service Doors

At each floor to be served, provide one solid, polished, Cast Aluminum Door and frame, the center of which shall be 47 in. above the finished floor line. Each door and frame shall be cast with hinge lugs and fitted with one ⅜-in. brass nickelplated hinge rod. The door frames shall be securely fastened to throat flanges by brass nickelplated screws and aluminum backer rings. Each door shall be furnished with quick acting refrigerator latch and with round rubber cushion gasket. All doors shall be water and smoke tight.

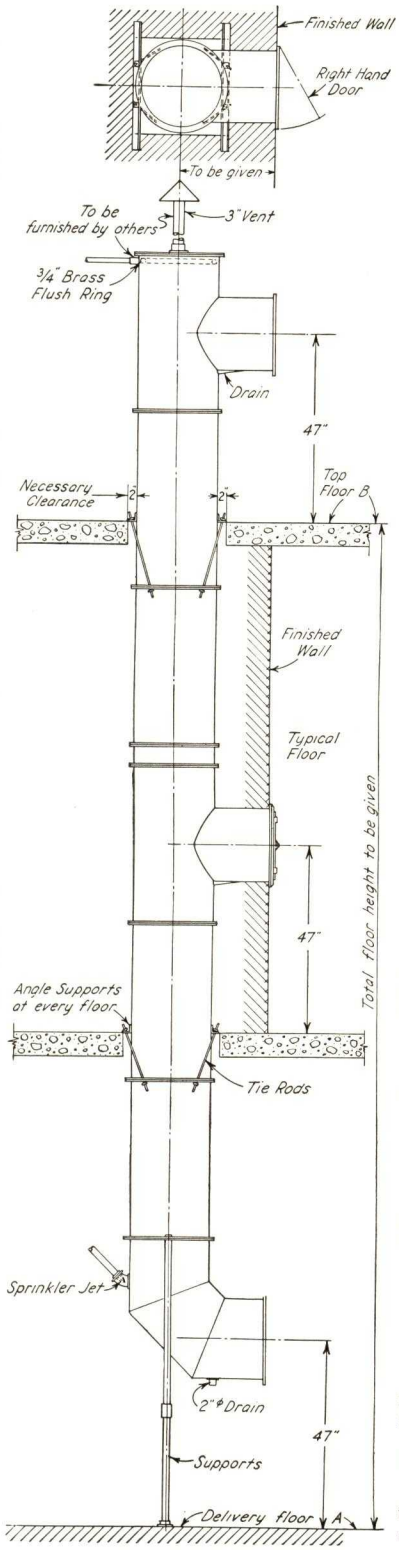
Note: Doors are 18-in. diam. on 24-in. chute, 20-in. and 18-in. chutes and 12-in. diam. on 12-in. chutes.

(C5) Outlet

Note: Select type desired.

(5a) The bottom of chute shall terminate in a 90° elbow of same diameter as the chute proper, center of which shall be 47 in. above the finished floor line. It shall be fitted with a heavy Cast Aluminum Door, attached to chute in the same manner as service doors. The door shall be provided with a round rubber cushion gasket and shall seal watertight when closed. In the elbow there shall be a standard 2-in. iron pipe connection with strainer, for connecting drain pipe to sewer.

(5b) The bottom of the chute shall terminate in a 45° elbow of same diameter as the chute proper, without a door.



(5c) The bottom of the chute shall terminate in a straight run .. in. below basement ceiling, without a door.

(5d) Furnish outlet with an automatic fire door.

Note: Adapted to (5c) only.

(C6) Top

Approximately 20 in. above top floor service door provide enameled disc top with 3-in. standard iron pipe connection in center for vent pipe. Top shall be bolted to flange of chute section and provided with a flat rubber gasket.

(C7) Flushing Ring

A perforated ¾-in. brass flushing ring shall be installed above the top throat section near the top of chute. Flushing ring shall have standard ¾-in. iron pipe connection for water supply line.

(C8) Supports

Chute shall be supported by two angle irons and four tie rods at each floor (and by pipe legs with cast iron bases at the outlet elbow).

(C9) Piping

All piping to and from chute (including vent pipe and ventilator) shall be furnished and installed by others.

(C10) Sprinkler Jets

Provide (one (1)) (specify number and location) standard 1-in. size automatic sprinkler jet(s) in (an) offset recess accessible from the inlet door.

(D) WELDED ALUMINUM LAUNDRY CHUTE SPECIFICATIONS

Note: The specification (C) Glass Enameled Laundry Chute applies to Welded Aluminum Laundry Chute in all details and construction, except as follows:

(C) Material

Chute shall be made of $\frac{1}{16}$-in. sheet aluminum (bottom elbow ⅛ in.).

(E) GLASS ENAMELED RESIDENCE LAUNDRY CHUTE SPECIFICATIONS

Note: The specification (C) Metal Glass Laundry Chutes in general applies to Residence Chutes, except as follows:

(A) Sizes

Sizes are 12 in. diameter cylindrical only.

(B) Outlets

Same as (C5a) or (C5c) with or without fire door as in (C5d). Drain fitting omitted in Outlet E.

(D) Top

Same as (C6) with the exception that ventilator outlet is customarily omitted. This can be furnished where specified.

PORCELAIN PRODUCTS COMPANY

1425 South 55th Court
CICERO, ILLINOIS

Representatives in All Principal Cities

See Local Telephone Directory

LAUNDRY CHUTES AND RUBBISH CHUTES

Products

Metal Glass Seamless Laundry Chutes; Metal Glass Seamless Residence Laundry Chutes; Aluminum Laundry Chutes.

Metal Glass Laundry Chutes

Standard—Metal Glass Laundry Chutes are smooth, glistening seamless tubes, porcelain enameled both inside and outside. (No rivets.)

Residence—Same material and construction as standard Metal Glass Chutes, adapted to home use.

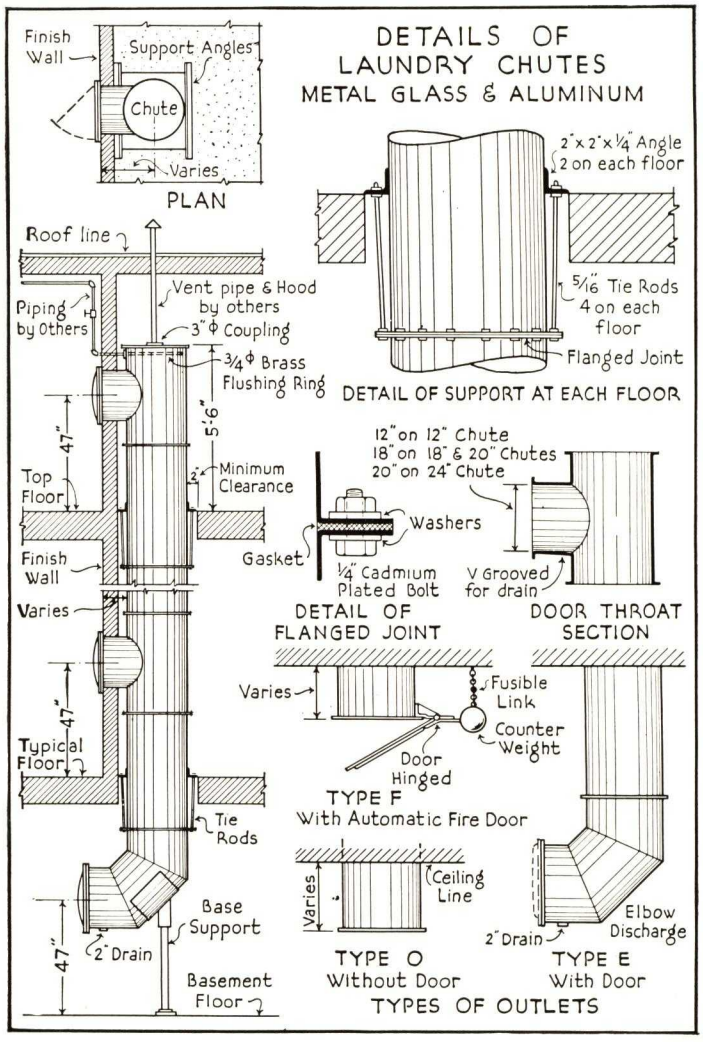
Aluminum Laundry Chutes

Specifications for Metal Glass Laundry Chutes apply to Aluminum Laundry Chutes in all details except as follows:

Material—Chute made of 16-gauge aluminum sheets.

Sprinkler Jet

As a standard accessory to Standard Metal Glass Laundry Chutes, Aluminum Laundry Chutes and Rubbish Chutes, there is a connection for a fusible sprinkler jet placed in an offset in the chute. As many jet connections as desired can be placed at different locations.



(A) METAL GLASS LAUNDRY CHUTE

Specifications

(A1) General—Furnish and install where indicated on plans (specify number) Standard Metal Glass Laundry Chute (s) (state which) (12 in.) (18 in.) (20 in.) (24 in.) inside diameter as manufactured by the PORCELAIN PRODUCTS COMPANY, Cicero, Ill.

(A2) Materials and Construction—The entire area of chute, both inside and outside, shall be surfaced with porcelain enamel fused into the metal. Chute shall be made of 18-gauge enameling iron with all seams welded and ground perfectly smooth before enameling. No rivets shall be employed. Chutes shall be made in suitable sections to meet building requirements. Sections shall be flanged at ends and joined together securely with cadmium plated bolts. Provide flat gasket between all joints.

(A3) Door Throats—The throat sections to which service doors are attached shall be welded to and form an integral part of the chute proper. They shall be of lengths required on plans to bring the back of the door frames flush against the finished wall. Each throat shall be made with a groove in the bottom side sloping downward in the direction of travel to insure prompt drainage when the chute is flushed. Square throats are used for porcelain enameled doors; round throats for cast aluminum service doors.

Note: Throats are 20 in. on 24 in. chute, 18 in. on 20 in. and 18 in. chutes, and 12 in. on 12 in. chute.

(A4) Service Doors—At each floor to be served, provide one porcelain enameled door and frame or one polished, Cast Aluminum Door and Frame, the center of which shall be 47 in. above the finished floor line. The door frames shall be securely fastened to throat flanges by brass nickel plated screws and aluminum backer rings. Each door shall be furnished with quick acting latch and with round rubber cushion gasket. All doors shall be water- and smoke-tight.

Note: Doors are 20 in. on 24 in. chute, 18 in. diameter on 20 in. and 18 in. chutes, and 12 in. on 12 in. chute.

(A5) Outlet—Note: Select type desired.

(A5a) The bottom of chute shall terminate in a 90° elbow of same diameter as the chute proper, center of which shall be 47 in. above the finished floor line.

It shall be fitted with a heavy cast aluminum door, attached to chute in the same manner as aluminum service doors. The door shall be provided with a round rubber cushion gasket and shall seal water-tight when closed. In the elbow there shall be a 2 in. brass pipe connection with strainer for connecting drain pipe to sewer. (Not used in residence chutes.)

(A5b) The bottom of the chute shall terminate in a 45° elbow of same diameter as the chute proper, without a door.

(A5c) The bottom of the chute shall terminate in a straight run.....inches below basement ceiling, without a door.

(A5d) Furnish outlet with an automatic fire door.

Note: Adapted to (A5c) only.

(A6) At each floor the chute shall be supported by four tie rods, suspended from two angle irons resting on the floor. The bottom (A5a and A5b) shall be supported by a pipe stand, made of 2 in. iron pipe, with floor flange resting on the floor.

(A7) Top—Approximately 5 ft. 6 in. above finished top floor provide porcelain enameled disc top with 3 in. galvanized iron pipe connection in center for vent pipe. Top shall be bolted to flange of chute section and provided with a flat gasket. (There is no vent opening on cover plate on residence chute.)

(A8) Flushing Device—A circular flushing ring shall be made of ½ in. copper tubing bent into a ring and perforated with ⅛ in. spray holes 2½ in. on centers with ¾ in. brass standard pipe tee connection for water supply. Holes shall be drilled so as to permit flushing by a spray of water. This device is placed near the top of the chute and to it the plumber connects a water line. A water valve shall be placed in basement for convenience.

(A9) Piping—All piping to and from the chute including water lines and drain pipe, vent pipe and ventilator shall be furnished and installed by others.

(A10) Sprinkler Jets—Provide (specify number and location) standard 1 in. size automatic sprinkler jet (s) set in (an) offset recess accessible from the inlet door.

(E) METAL GLASS RUBBISH CHUTE

Specifications

(E1) General—Furnish and install where indicated on plans (specify number) Metal Glass Waste Chute (s) as manufactured by the Porcelain Products Company, Cicero, Ill.

(E2) See (A2).

The same specifications for Metal Glass Laundry Chutes will apply to Metal Glass Rubbish Chutes, except the doors.
(E3) The inlet doors shall be located at a convenient point above each floor. Each door shall have a hopper attached to the back side so constructed that when the door is open the throat opening of the chute is closed.

(E4) Outlet—At a point approximately 4 ft. above the delivery floor the chute shall terminate in an elbow boot with a heavy hinged door provided with substantial hinges and latch.

Note: *The following are alternate items for the outlet:*

(E4b) Outlet to be furnished with automatic firedoor.

(E4c) Outlet to terminate in 45° elbow.

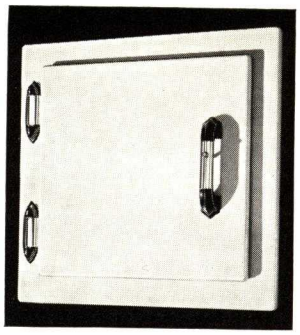
(E4d) Outlet to terminate in straight run.....inches below basement ceiling.

(E5) See (A7).

(E6) See (A6).

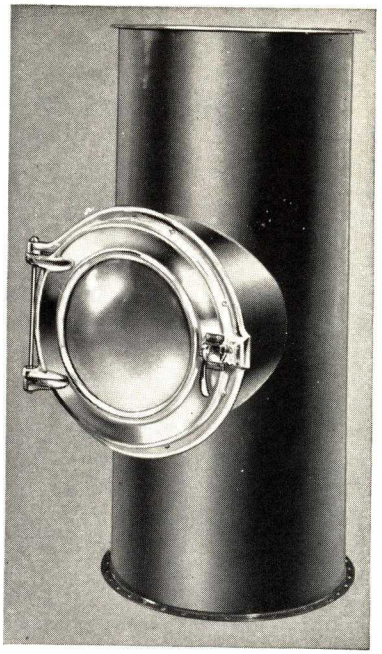
(E7) See (A10).

(E8) Piping—See (A9).

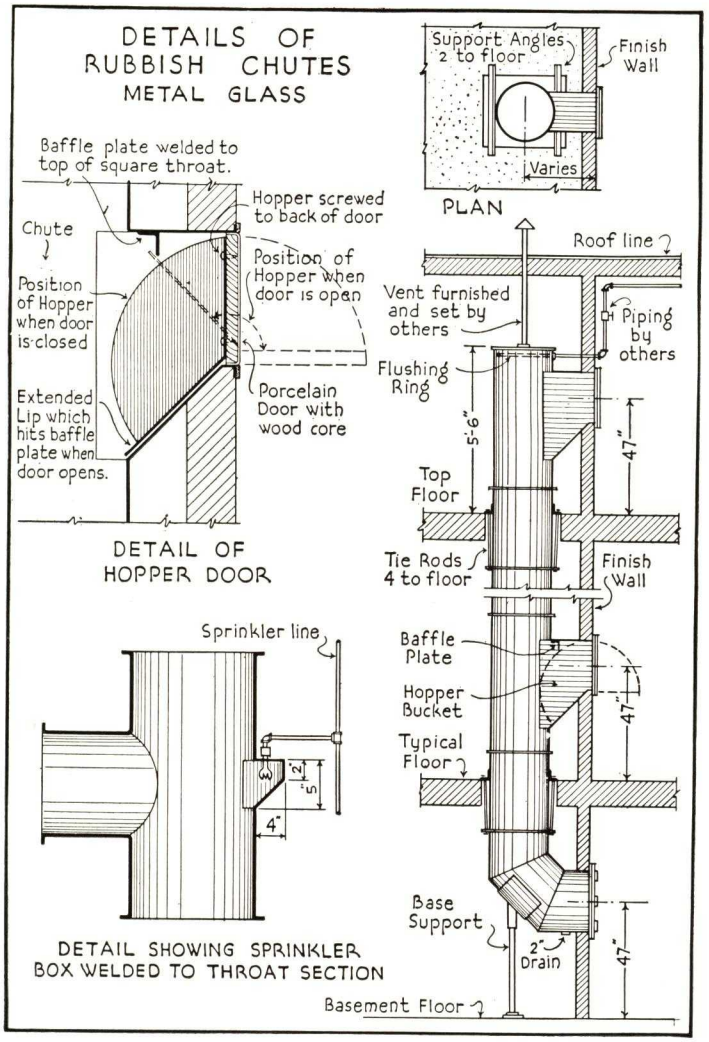


Above:
This neat all-Porcelain-enameled door is available in a wide selection of colors for all chute installations. Note modern design of fittings

At Right:
A typical throat section showing cast aluminum door equipped with easy-acting latch.



Two Standard Types of Chute Doors



THE SPENCER TURBINE CO.

Member of The Producers' Council, Inc.

Manufacturers of Vacuum Cleaning Systems, Blowers and Exhausters

488 New Park Avenue, HARTFORD, CONN.

Products

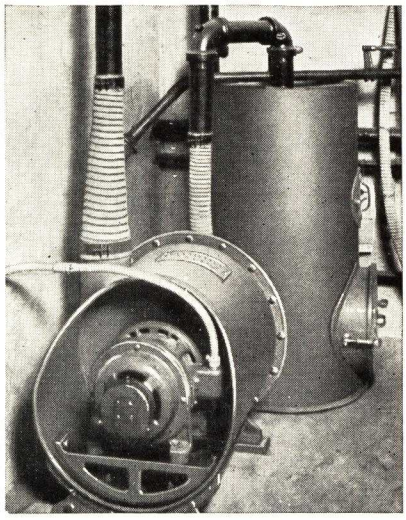
CENTRAL AND PORTABLE VACUUM CLEANING SYSTEMS; SWIMMING POOL CLEANING EQUIPMENT; BOILER FLUE CLEANING APPARATUS; the SPENCER TUBE-VAC. Also Turbo Compressors (Blowers); Organ Blowers (Orgoblo).

Spencer Central Vacuum Cleaning Systems

Spencer Central Vacuum Cleaning is a permanently installed system for the speedy and complete removal of dirt and dust from all kinds of floors, walls, ceilings, furniture and other building equipment. It consists of five essential parts, each carefully selected and installed to meet the special requirements for each individual building.

A vacuum producer, located in the basement, and piped to inlet valves on all floors of the building, draws all dirt and dust into a specially designed separator which is entirely enclosed and readily cleaned. Light weight, flexible hose and special vacuum tools are provided for each operator.

Capacities—Each type of building calls for a different layout, equipment and tools. Data sheets with tool recommendations are obtainable for every type of building. Spencer Engineers are available for layout service. In general, the Spencer System provides a capacity of 2½ hp. per sweeper up to and including 30 hp. Above 30 hp., the capacity is 2 hp. per sweeper.



5 Hp. Motor-Operated Vacuum Producer

Spencer Vacuum Producers — The Spencer Vacuum Producer is of the turbine type but differs from most turbine exhausters in that it is designed and built especially for vacuum cleaning.

The impellers are made of the best sheet steel or duralumin; carefully balanced and tested. They are so proportioned that they will not clog or wear out and are mounted in the turbine casing with extra wide clearances on both sides.

It is also characteristic of the machine that the desired volume may be delivered without changing the vacuum. This makes possible uniform results in all parts of the largest and highest buildings.

Separators — The principle of centrifugal separation is standard on Spencer Systems. It has been found from actual tests that centrifugal separators will separate from 95% to 98% of the dust which is picked up by the cleaning tool.

Tools—Superiority of cleaning implements and accessories is universally acknowledged. Spencer tools are designed with openings in correct proportion to the rest of the system; also with special consideration as to convenience and fitness of the various requirements. Strong in construction, light in weight, and shaped for fast and effective work. Tools are equipped with Spencer universal controllable swivel, which enables operator to remove dirt beyond the reach of the rigid tool. All wearing surfaces are renewable. Tools are attached to handle by means of a convenient locking chuck.

Three Main Objectives of a Cleaning Operation—Spencer Central Vacuum Cleaning Systems accomplish the following:

(1). Thoroughness — In exhaustive tests in leading schools, the powerful Spencer vacuum, scientifically applied with the correct tools, has demonstrated its ability to remove more of the dirt and dust in less time than other methods.

(2). Speed — In office buildings, organized crews of operators reduce the time required for cleaning. In schools, theatres and hotels, the ease of cleaning around furniture results in faster cleaning.

(3). Cost — Because the equipment is simple in design, requiring little attention and because these systems are built to provide satisfactory service over long terms of years, both the operating and amortisation costs are extremely low.

Spencer Central System

Heavy Duty Portable Vacuum Cleaners

A new portable unit embodying the same principles and using the same tools as the Central System, is now available. It weighs only 150 lb., is easily moved around, provides complete separation of the dust and is easily cleaned.

Entirely practical for schools, hotels, theatres and hospitals and used also in office buildings and stores.

Larger units of the Portable Truck type are also available for industrial plant service. Bulletins on request.

Boiler Flue Cleaning Apparatus

With special attachments available, Spencer system can be used in cleaning horizontal return tubular and cast iron sectional boilers with a remarkable economy in fuel consumption.

Swimming Pool Cleaning Equipment

The use of Spencer cleaning equipment for swimming pools is most desirable since it permits the removal of sediment from the bottom of the pool without lowering the water level appreciably. Bulletin on request.

Spencer Portable

The Spencer Tube-Vac

An all-steel, motor operated unit for furnishing power for pneumatic tubes systems. Made in a complete range of capacities.

Engineering Service

The Engineering Department offers its services without obligation in recommending the proper size and type of equipment, piping layout, or other engineering details. Bulletins for Architects on request.

B. F. STURTEVANT COMPANY

Vacuum Cleaning, Heating, Ventilating and Air Conditioning Equipment

MAIN OFFICE AND WORKS
HYDE PARK, BOSTON, MASS.

For List of Offices, see our page on Fans, Blowers, etc.

Sturtevant Products

Sturtevant Puts Air to Work

The complete line of Sturtevant Equipment includes PORTABLE and STATIONARY VACUUM CLEANERS and practically every type of AIR SUPPLYING, EXHAUSTING and CONDITIONING APPARATUS; UNIT HEATERS; and many other related items.

For Sturtevant Fans, see File Index.

Co-operation

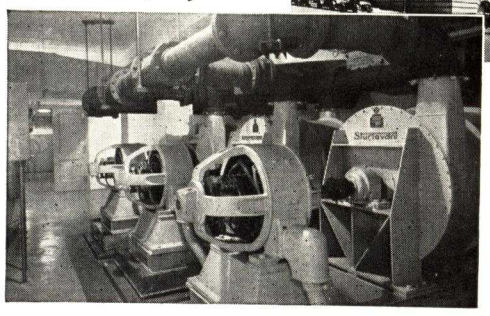
Sturtevant Engineers located at each of the branch offices are always ready to co-operate with architects, engineers and contractors in the selection of equipment suitable for any prospective installation. These men are at your service. Call on them.

Central Vacuum Cleaning System

The central vacuum system is recognized today as the most efficient method of cleaning public and private buildings, but the economical operation of such a system depends upon the piping, vacuum producer and design of tools.

The Sturtevant Central Vacuum Cleaning System includes piping recommendations which insure correct operation of the system—vacuum producer which will maintain the correct vacuum throughout the system—tools designed individually for specific cleaning operations.

The system consists of a vacuum producer together with a dust separator, both located in the basement and connected to a piping system which runs through the building. Outlets from this piping system are so located that any part of the building can be reached by an operator with 50 feet of hose and the necessary cleaning tools.



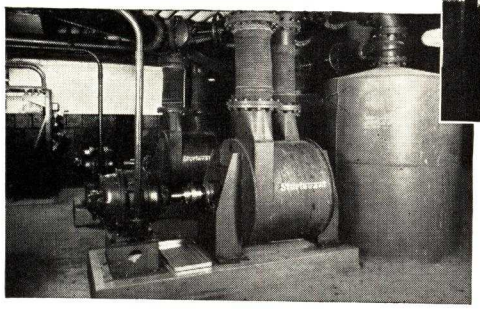
House of Representatives Office Building, Washington, D. C.

The cleaning principle is based on the maintenance, by the exhauster in the basement, of a fixed vacuum on the system and a flow of air at controlled velocities through the tools and the piping system. At the tool, high velocity flow of air is necessary to pick up the dirt within the floor space covered by the tool and to hold it in the air stream. In the piping system, however, the velocity is reduced to the minimum that will carry the dirt along the pipe, thus reducing the power required to operate the system.

In spite of the apparently complicated requirements of the Sturtevant Central Vacuum Cleaning System there is only one rotating element; nothing to regulate, nothing to wear out.

Typical Installations

Department of Justice Building, Washington, D. C.
House of Representatives Office Bldg., Washington, D. C.
60 Wall Tower, New York, N. Y.
Hotel Traymore, Atlantic City, N. J.
Central High School, Kansas City, Mo.
Broadway Department Store, Los Angeles, Cal.
Earl Carroll Theatre, New York, N. Y.
Municipal Auditorium, St. Louis, Mo.
Oliver High School, Pittsburgh, Pa.
University Club, Boston, Mass.
Public Schools No. 123, 124 and 150, New York, N. Y.



60 Wall Street Tower, New York, N. Y.

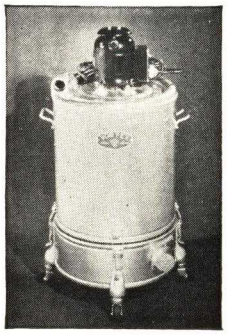
Complete Data

Our twenty-page booklet describes the system in full detail, gives helpful data on determining size of cleaning plant, layout of piping system and pipe and fitting requirements. Also describes Vacuum Producers and Separators and gives complete Standard Specifications. Write for your copy of this Bulletin No. 397-I.

Portable Vacuum Cleaner

The new Sturtevant Vortex Cleaner, suitable for use where a central system is not available, is the combined result of Sturtevant Engineering and the helpful suggestions of hundreds of users. Exceptionally rugged in construction, yet weighing only 60 lbs., it can be easily handled by one man.

Height—36 in. *Working Suction*—23½ in. *Water Working Volume*—85 c.f.m. *Motor*—Universal 110-volt or 220-volt single phase, a.c. or d.c.



DUPLEX INCINERATOR DIVISION

OF THE CONSOLIDATED IRON-STEEL MFG. CO.

Manufacturers of Duplex Incinerators

1291 East 53rd Street, CLEVELAND, OHIO

The Company

The Consolidated Iron-Steel Mfg. Co., of which DUPLEX INCINERATOR COMPANY is a Division, is a substantial organization with fifty years of successful manufacturing experience.

The improved features of Duplex Incinerators, which are made complete in our own foundry and shops, have been developed from long, intimate experience with garbage and waste burning equipment. They are sold as a proven product and guaranteed by an institution worthy of confidence.

Engineering Service

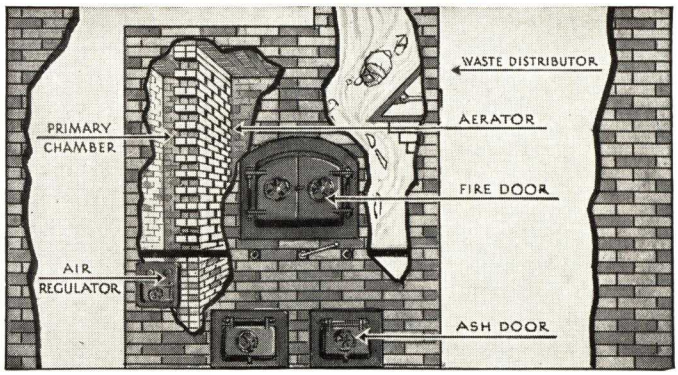
In selecting a Duplex Incinerator, the owner secures the services of a skilled sales engineer who understands the technique of incineration and has been thoroughly trained in the service of this company. This insures an adequate, properly adapted installation, with permanent satisfaction—guaranteed by the name, "Duplex".

In addition to our standardized, chimney-fed incinerators, we also design and furnish special incinerators and destructors. An Engineering Department, trained in this work, is maintained for the benefit of architects and engineers. This service is without obligation, and we welcome the opportunity to consult with you.

DUPLEX INCINERATORS

Description

The Duplex Incinerator is arranged with a brick combustion chamber of highly efficient, though simple, design having a fire brick lining. It is located at the base of a chimney, usually in the basement of the building. Into this chamber are built grate rests with full dumping grates, wall bearings, stops, waste distributor, access doors, draft regulator and miscellaneous supporting iron.



Chimney starts on top of the incinerator and extends straight up through the building, usually in the kitchen wall or convenient to corridor or rear porch. Service or receiving hopper doors, readily accessible, are built into chimney wall at the most convenient point on the floor or floors above.

All metal parts are furnished by us with ¾-in. scale installation detail drawings for guidance of mason in setting the parts.

Operation

Duplex Incinerator performs a triple function in the disposal of waste in that it—(a) provides sanitary concealed storage for waste until it is dried, ready to be burned; (b) provides fuelless, odorless burning, and (c) provides storage for the ashes, flame-sterilized tin cans, broken glass and crockery for timely removal.

Garbage, waste paper, broken boxes of wood and paper, wilted flowers, discarded newspapers, sweepings, and all other miscellaneous waste are deposited in the receiving doors, right at hand on upper floors of buildings, where they fall to the incinerator chamber. As waste falls it strikes the waste distributor, which scatters the material over the grates, preventing packing which would interfere with drying and combustion. Then follows the drying out process by means of the chimney draft and aerator lattice.

When lighted, the waste paper, broken wood and other readily combustible matter contribute a hot fire which completes the drying and consumes the contents of the incinerator chamber, as garbage is then readily combustible.

Principles of Construction

The Aerator Lattice—Air is drawn by the chimney through the draft regulator into the primary chamber and is distributed by the aerator lattice which extends the full width and height of the incinerator. This current of air passes through and over *all* the garbage and other waste in the main incinerator chamber.

Between burnings, this greater air circulation prepares the waste for burning by evaporation of moisture.

During burning, the incoming air is heated by the hot fire brick in the aerator lattice which is in contact with the fire, and that feeds a perfectly distributed supply of preheated oxygen to maintain combustion *on top* of the waste accumulation. Odorous gases released by the heat approaching waste below must pass through the fire and be sterilized or consumed.

Draft regulator provides separate control of up-draft through horizontal grates, and top draft through Aerator, to obtain controlled burning and maximum results under all conditions.

The Waste Distributor—The efficient, fuelless incineration accomplished in Duplex Incinerators is the result of positive aeration of all waste secured as follows:

First—by air distribution the entire height and width of the incinerator. Second—by placing air intake and distribution on side opposite chimney so that air current acts on *all* the waste. These two results are accomplished by the Duplex Aerator Lattice in a highly satisfactory manner.

Third—by avoiding the compression of the accumulation of waste due to the impact of its fall from upper floors of the building. Fourth—by shifting the waste in a loose pile toward the point of incoming air to insure its contact with the drying air current. The latter two results are secured by the unbreakable heavy iron waste distributor which prevents packing and shifts waste into a loose pile to dry.

These functions, with consequent complete aeration of waste, set a new standard of performance in fuelless, chimney-fed incinerators.

Standard Models

Duplex Incinerators are manufactured in a wide range of standard models designed to meet specific requirements. The table below will guide the reader to the type which will meet his needs and we will be glad to furnish additional data regarding any model upon request. We also manufacture outdoor incinerators, direct charged basement incinerators and high temperature incinerators or destructors for large installations in hotels, hospitals, laboratories, etc.

STANDARD MODELS

Model	Residences, rooms	Apartments, rooms	Schools, students	Hospitals, beds	Stores, average group
S	Not over 10				
B	10—14	Under 18			
D	Very large	18— 40			
L		40— 80	Under 300	50	1— 6
T		80—120	300— 500	50— 90	6— 8
N		120—160	500— 700	90—120	8—10
F		160—240	700—1000	120—180	10—15
K		240—320	1000—1200	180—260	15—18

Architect's Specifications

The contractor shall furnish all metal parts, fire brick, masonry materials and labor, to install complete where shown on plans—( ) Model ( ) Duplex Incinerator, having ( ) No. ( ) Receiving Doors.

Incinerator (s) to be installed according to the detail plans and specifications of DUPLEX INCINERATOR COMPANY, 1291 East 53rd Street, Cleveland, Ohio.

EQUAL-AIRE INCINERATOR DIVISION

SARGENT BUILDING SPECIALTIES CO.
16 Warren Street
NEW YORK, N. Y.
SALES REPRESENTATIVES IN PRINCIPAL CITIES

The Principle of "Equal-Aire"

If incineration is to be complete, economical and odorless, certain fundamental laws of combustion must be observed.

The Sargent Equal-Aire Incinerator provides equal distribution of air in the combustion chamber. This accounts for its uniformly successful performance. In terms of incineration, it means utmost waste destruction in the shortest time with maximum consumption of liberated gases.

Equal distribution of air is attained by means of air controls in the front or side of the incinerator which supply air through a duct between the fire brick and common brick walls to a series of air ports in the fire brick wall. By distributing these ports over the entire wall surface, a constant flow of air on all sides of the waste is assured, thus providing a drying out process before burning. Top burning, which is essential to the elimination of obnoxious odors, is effected by the feeding of preheated air through the ports. Besides furnishing air in correct proportions to all parts of the incinerator, a steady circulation is created, thereby insulating the outer walls, which reduces the possibility of heat cracks much more effectively than a dead air space.

The method of laying up the walls requires a minimum of fire brick, lending economy to its construction.

Specifications

Furnish and install where shown on plans Sargent "Equal-Aire" Incinerator(s) Model — equipped with heavy cast iron dump grates and having a live-air insulating and air-feeding duct between the common brickwork and the fire brick lining.

Hopper Doors No. (..) to be built in flue on each floor above basement (or where indicated) and to have polished aluminum (cast iron) front equipped with concealed checking device.

All work to be completed in a neat and workmanlike manner and in strict accordance with detailed drawings and specifications of the manufacturers, SARGENT BUILDING SPECIALTIES CO., 16 Warren Street, New York, N. Y.

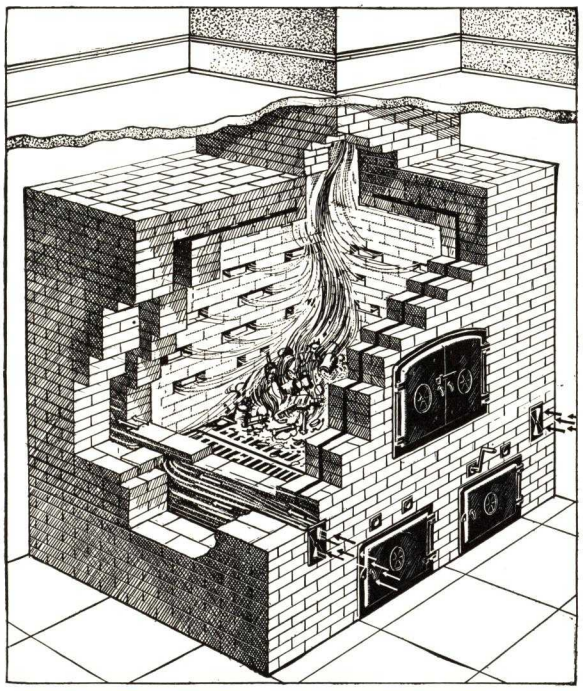
STANDARD MODELS AND CAPACITIES

Model	*Apartments		Hospitals	Schools	Grate area (sq. ft.)	Minimum flue size, inside dimensions, in.
	Number rooms	Number suites	Number beds	Number students		Using 1 or 5 hopper doors
22	Residences				5	12x12, if more than one hopper 16x16
23 or 32	40	18	40	250	7.5	18x18
24	90	36	40–70	250–350	10	18x18, over 4 story, 20x20
33	110	40	50–80	300–400	11	18x18, over 4 story, 20x20
25	150	70	70–90	400–500	12.5	18x18, over 4 story, 20x20
34 or 26	180	80	80–120	500–700	14.5	20x20, over 6 story, 24x24
35	230	100	120–200	700–1000	18	20x20, over 6 story, 24x24
36	280	125	200–275	1000–1250	21	20x20, over 6 story, 24x24

*In selecting proper model for apartments, *both* number of rooms and suites must be considered.

**Height of incinerator is variable, depending upon headroom in basement. Average—7 ft. 2 in.

Heavy duty types for wet garbage and industrial waste designed according to special needs.



Showing "Equal-Aire" Construction with Live-Air Insulating Duct and Air Intake Controls

Combustion Chamber Parts

100% grate area, which aids dehydration and eliminates the nuisance and odors that are sure to arise from the accumulation of wet garbage on a moisture soaked brick hearth. Heavy cast iron double leaf firing door 26x20 ins., with perforated cast iron liner to prevent warping, is standard equipment. Smaller models are equipped with single leaf cast iron firing door.

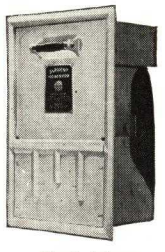
Hopper Doors

Appearance, durability and mechanical perfection have been successfully combined. The buck is heavy cast iron, eliminating the possibility of distortion. Standard equipment includes concealed checking device.

Offset Type

No.	Type	Approx. door size
1	Offset	12 x14 ins.
3	Offset	10 x11½ ins.
5	Flush	11½x11 ins.
6	Flush	10 x 8½ ins.

Aluminum or cast iron.



Flush Type

References

Apartments

Carl Mackley Houses, Philadelphia
Westfield Acres, Camden, N. J.
Knickerbocker Village, New York
Prudential Housing, Newark
West Side Housing, Cleveland
Outhwaite Housing, Cleveland
Kenfield Housing, Buffalo
Laurel Homes, Cincinnati
Total—380 incinerators

Schools and Hospitals

Woodrow Wilson and Anacostia, Washington, D. C.
High School, Greenwich, Conn.
Massachusetts State College
Middlebury College, Middlebury, Vt.
Homer Phillips Hospital, St. Louis
State Hospital, Holmdel, N. J.
U. S. Marine Hospital, Stapleton, N. Y.
Scott High School, E. Orange, N. J.

EWING INCINERATOR COMPANY

2432 Irving Park Boulevard, CHICAGO, ILL.

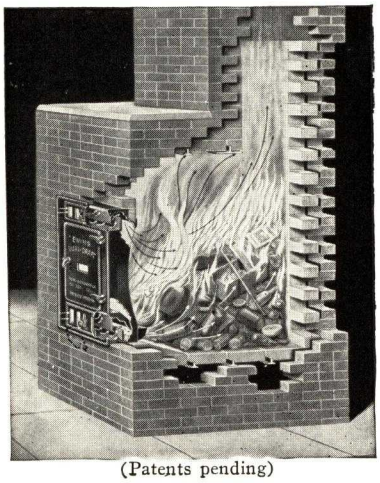
Products

EWING DUAL-DRAFT, FLUE FED, INCINERATORS in *Automatic* and Hand Controlled types; also PORTABLE GARBAGE and RUBBISH BURNERS.

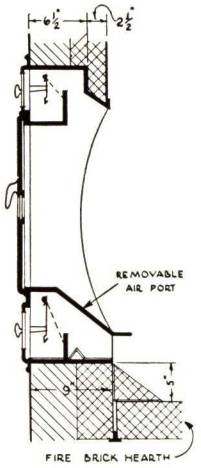
The EWING INCINERATOR COMPANY are also originators of the Ewing Automatic Damper for controlling excessive chimney draft in tall buildings.

Flue Fed Incineration Pioneers

In 1913 Hugh W. Ewing pioneered Flue Fed Incineration in Chicago. As an outgrowth of all these years spent exclusively in the Incinerator business, the EWING INCINERATOR COMPANY are the originators and owners of patents covering the introduction of *automatically controlled over-fire air* in Flue Fed Incinerators.



(Patents pending)



The Ewing AUTOMATIC Dual-Draft Principle

Radically different, in operation, the "Ewing Dual-Draft" is designed upon accepted engineering principles. Admitting continuous over-fire air in variable quantities and at widely spaced levels is decidedly new and of the greatest importance for proper combustion. The use of an air-tight fire brick hearth makes positive the *automatic control* of all air entering the combustion chamber and prevents the distillation of garbage odors and smoke. Hence, when the material in the Incinerator is lighted, the air for combustion must first be drawn through the upper air port where it impinges directly on the material to be burned. This produces a slow, even flame across the entire top of the material.

As the fire gathers headway, the velocity of the flue gases increases and the upper damper starts to function. The chimney suction gradually pulls this damper shut so the volume of incoming air is *automatically* diminished. The small amount of air needed is drawn through a permanent opening above the damper.

As the fire burns down slowly, air is being drawn through the lower air port, impinging upon the base of the material, producing the same high efficiency in combustion as obtained with under grate air in boiler practice. As the lower damper is almost twice as heavy as the upper, it remains open longer, directing a greater volume of air at the base of the material where it is most needed.

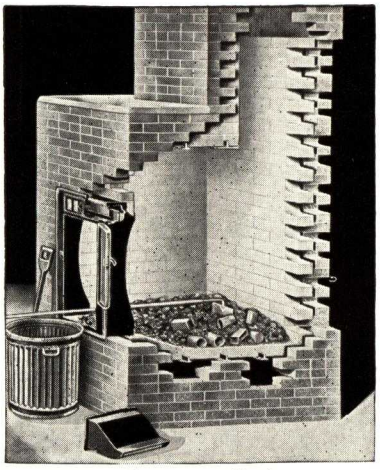
As might be expected, the introduction of oxygen at this point speeds up the fire. Soon this damper is *automatically* closed by the suction of the chimney before too great a velocity of flue gases can take place. And, as is the case with the upper damper, a sufficient amount of oxygen is taken in above the damper to maintain slow, complete combustion. As the fire in the Incinerator burns down, the chimney suction becomes less and the lower damper, due to its extra weight starts to open first, again supplying additional oxygen at the base of the material. When the burning is about over, the suction becomes even less and the upper damper gradually opens and a continuous passage of air through both air ports and up the chimney is established for drying and absorbing moisture from material thrown down prior to the next burning.

Low Cost Construction and Upkeep

(1) No time is wasted by the mason in setting grates, ash doors and other unnecessary parts.

(2) The simplicity of construction enables the mason to build this Incinerator in about one-half the time required for other types.

(3) Since no ash pit is required, greater capacity in the Incinerator is obtained with relation to floor space.



(Patents pending)

(4) There is never any need for expensive replacements of grates, or the annoyance caused by warping or getting out of place.

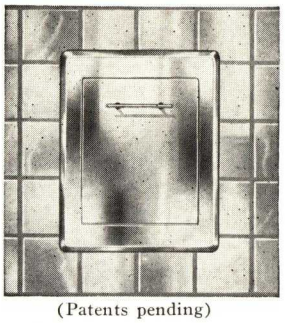
(5) With a properly designed flue fed Incinerator auxiliary gas is not needed for successful operation.

Easy to Clean

When the Incinerator is to be cleaned, the entire lower air-port may be slipped out leaving one side of the Incinerator chamber wide open. The fire brick hearth is set at a proper height above the floor so that a small ordinary garbage can will fit under the opening. The ashes are either shoveled or hoed directly into the can.

Attractive Receiving Doors

Ewing Receiving Doors are the flush type with beveled edge extending out from the wall but ¼ in. They are so designed that no bolts or advertising matter mar their smooth surface.

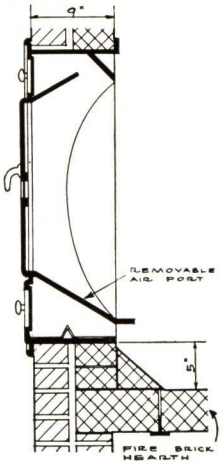


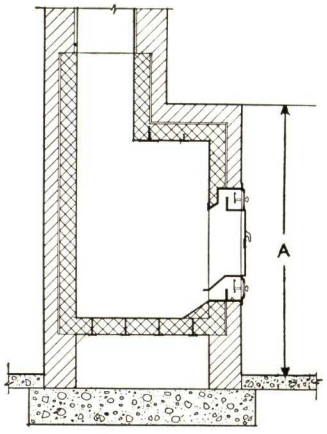
(Patents pending)

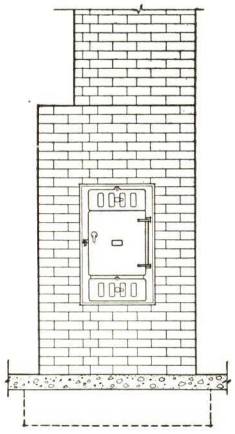
This door may be had in an aluminum ground coat, which can be used in its original finish or painted to harmonize with any desired color scheme, or a beautiful satin chrome with polished chrome handle supported on black bakelite posts.

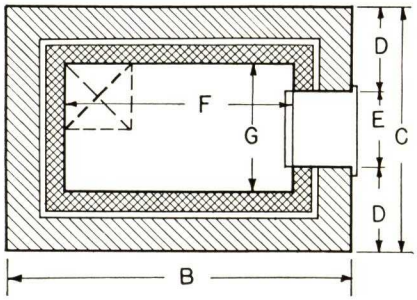
The Standard Ewing Dual-Draft Non-automatic Incinerator

The Standard Ewing Dual-Draft Non-automatic Incinerator differs only from the automatic in that it is hand controlled. The principle being the same and the cost somewhat less. By comparing the sectional diagram at the right with the one above in the left hand column, the difference in design of the damper and air-port arrangement is at once apparent.



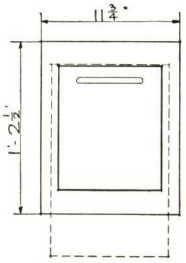




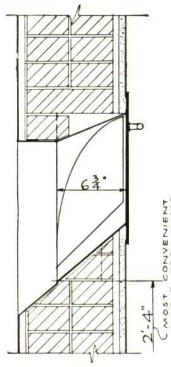


Elevation and Plan of Incinerator

(Refer to table for dimensions)



Diagrams of Receiving Door and Hopper



Architect's Information

Chimney must be in either of the rear corners to give the best results.

Chimney: The sides of the chimney must be perpendicular all the way up and the top of the chimney must extend high enough above any roof construction to avoid interference with the draft.

Footing for Incinerator should extend at least 6 in. out from the outside of the Incinerator walls.

Incinerator Lining: 4½-in. fire brick lining in the Incinerator must be used in all models.

Ordinarily, in 12x12 and 16x16-in. chimneys flue lining is used: however, in larger chimneys 4½-in. fire brick lining must be carried to a height of not less than 30 ft. above the Incinerator roof.

In buildings other than residences, the steel furnished for the support of the Incinerator roof is not designed to support the chimney. Where the chimney is not carried from floor to floor additional structural steel must be furnished.

Standard Specification

The Mason Contractor shall furnish and install where shown on plans..... (Standard) or (Automatic) "Ewing Dual-Draft" Incinerator(s), Type....., having ....., Receiving Door(s), Type....., in strict accordance with Manufacturers' details.

MODELS—CAPACITIES AND DIMENSIONS

Model	B	1B	2B	B	4C	5C	6C	7D
Residence (number of rooms)	10	14	20	.....	.....	.....	.....	.....
Apts. (number of rooms).....	24	60	90	140	200	250	300	400
Hospitals (number of beds)..	.....	.....	.....	60	80	100	125	200
Schools (number of pupils)..	.....	.....	.....	.....	1000	1200	1500	2000
Flue sizes:								
Res. and Apts.—1 rec. door on first floor.....	12x12	12x12	12x12	16x16	16x16	.....	.....	.....
With more than 1 rec. door	16x16	16x16	16x16	16x16	16x16	.....	.....	.....
Up to 3-story bldgs.....	.....	16x16	16x16	16x16	16x16	16x16	16x16	16x16
Up to 8-story bldgs.....	.....	.....	20x20	20x20	20x20	20x20	20x20	20x20
Over 8-story bldgs.....	.....	.....	.....	24x24	24x24	24x24	24x24	24x24
Incinerator height A...	6'6½"	6'6½"	6'6½"	7'1"	7'6"	7'6"	8'	8'
Outside measurements B...	3'8"	4'2"	4'7"	4'7"	6'1"	6'11"	6'11"	8'6"
Outside measurements C...	3'0"	3'5"	3'8"	4'2"	5'	5'	5'4"	5'4"
Outside measurements D...	11"	1'11½"	1'3"	1'4"	1'9"	1'9"	1'9"	1'9"
Outside measurements E...	1'2"	1'2"	1'2"	1'6"	1'6"	1'6"	1'10"	1'10"
Inside measurements F...	2'2"	2'8"	3'1"	3'1"	3'9"	4'7"	4'7"	6'2"
Inside measurements G...	1'6"	1'11"	2'2"	2'8"	2'8"	2'8"	3'	3'

THE EWING AUTOMATIC "DUAL-DRAFT" GARBURNER

The Garburner, latest of the Ewing Automatic "Dual-Draft" Incinerators is designed in three sizes, 4, 8, and 12-bushel capacities. It is ideal for installation in existing homes as well as in the modern home built without a basement.

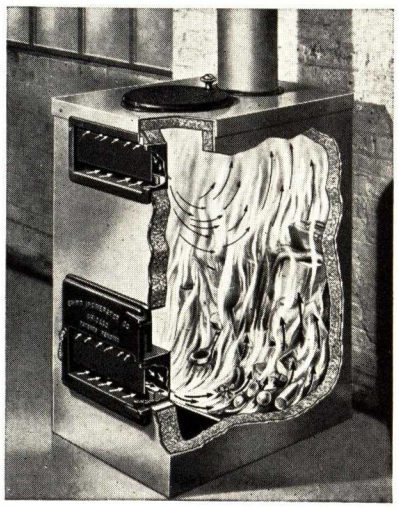
Small industrial plants find it well suited to their needs. Large industrial plants, amusement parks, refreshment stands, schools, camps, garages and small hospitals find it indispensible as a trash burner.

In rural communities, where gas is not available, this unit is the answer to the garbage disposal problem.

The Garburner's sturdy refractory lining is encased in a beautifully plain metal shell. The charging door is at the top while in the front are placed the air ports equipped with *automatic dampers.* The lower air port is so designed that it swings open with the clean-out door, thus affording an unusually large opening for easy removal of the ash.

The flue connection may be made directly to the chimney or breeching of the heating unit, where coal is not used or into a separate flue where possible.

This unit is highly efficient when all paper and combustible waste, such as boxes, crates and cans, are fed into it in the same intermixture as into a flue-fed incinerator. It may be used out of doors as an outside burner for trash and garbage, providing an adequate smoke stack is used.



CAPACITIES AND OUTSIDE DIMENSIONS

Bushel capacity	Width	Depth	Height
"4"	17½"	30"	30"
"8"	26"	34"	30"
"12"	25"	34"	42"

Pipe: 8" round.

Left: The Garburner "12" is designed for heavy duty, having both upper and lower automatic dampers.

Right: Garburners "4" and "8" have the same sturdy construction as the "12," but because of their height have but the one automatic damper. Over Fire Air is supplied through fixed Air Ports just below the cover.

Write Home Office for address of our nearest representative.

MEMORANDA

JOSEPH GODER INCINERATORS

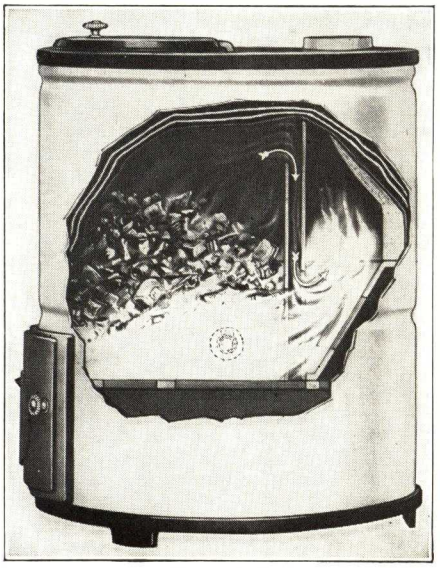
SCHWAB FURNACE & MFG. CO., MILWAUKEE, WIS.

Manufacturers of Incinerators of All Types and Sizes

193 So. 2nd Street, MILWAUKEE, WIS.

REPRESENTATIVES

BUFFALO, N. Y., Ideal Specialty Co., 84 Sterling Ave.
CHICAGO, ILL., Joseph Goder, 43 E. Ohio St.
COLUMBUS, OHIO, The V-W Co., 214 Oak St.
HOUSTON, TEX., Lehman Steel Products Co., M. & M. Bldg.
INDIANAPOLIS, IND., Geo. A. Haynes, 5356 Ohmer Ave.
MADISON, WIS., Theo. Kupfer Foundry & Iron Works, 629 E. Mifflin St.
MINNEAPOLIS, MINN., J. F. Jackson, 803 Pence Bldg.
OMAHA, NEB., Earl S. Lewis & Co., 601 Redick Tower
PHILADELPHIA, PA., W. A. Laub Co., 1700 Walnut St.
PITTSBURGH, PA., E. W. Lauschke, Fulton Bldg.
ST. LOUIS, MO., Builders Specialty Co., 214 Mart Bldg.
ST. PAUL, MINN., C. B. Ellyson, 503 Minnesota Mutual Life Bldg.



Disposall 3

Disposall 3

The Odorless and Safe Home Incinerator

Disposall is the home incinerator that absolutely destroys odorous gas. Disposall stands out, because it is completely insulated with asbestos; it also has a firebrick-lined combustion chamber.

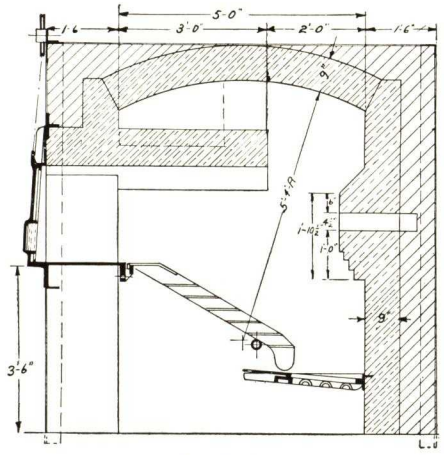
Disposall can be connected to any existing chimney by means of a standard 7-inch stove pipe.

Specifications

Capacity	3 bushels
Diameter	25 inches
Height	36 inches
Gas connection	¾ inch
Flue	7-inch standard stove pipe

Goder Destructors

Goder Destructors have been in use for over twenty years in hospitals, institutions, hotels, industrial establishments, municipal and government installations, sewage plants, etc.



Goder Destructor
Longitudinal-section through furnace chamber

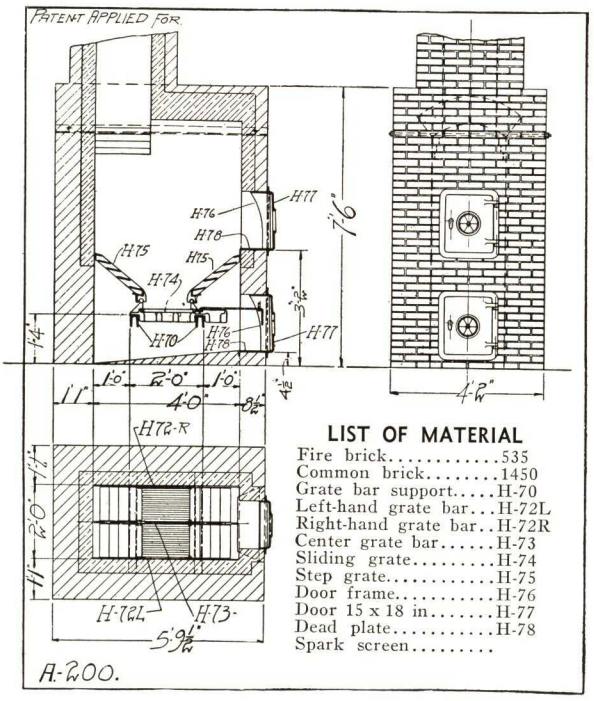
Goder designed Step-Grate Incinerators are universally adapted and have been in use for years under widely varying conditions with complete satisfaction.

We are equipped to furnish destructors for all requirements and all capacities. Outline your disposal problem to us and our engineering department will suggest correct type and size.

Goder Chimney Fed Incinerators

Goder Incinerators incorporate the Step Grate in their design, which permits the closest possible contact of air with the material to be burned. Goder Step grates also permit the use of the Sliding Ash Grate and provide an inclined fuel bed to prevent the packing of material on the grates.

Simplicity and ease of installation is one of the most important advantages offered.



LIST OF MATERIAL

Fire brick.....535
Common brick.....1450
Grate bar support....H-70
Left-hand grate bar...H-72L
Right-hand grate bar..H-72R
Center grate bar.....H-73
Sliding grate.....H-74
Step grate.....H-75
Door frame.....H-76
Door 15 x 18 in.....H-77
Dead plate.....H-78
Spark screen.....

MODELS AND DIMENSIONS

Model No.	Capacity	Size			Grate area, sq. ft.	Flue size,
		Width	Depth	Height		
75	Up to 6-room	2′ 8″	3′ 1″	4′ 6″	2.1	12″ x 12″
80	8-10 room res.	3′ 5½″	3′ 6″	6′ 4″	4.3	12″ x 12″
95	12 room res.	3′ 6″	4′ 5½″	6′ 4″	5.4	12″ x 12″
110	Up to 15-room residence	3′ 6″	4′ 5″	6′ 4″	6.75	12″ x 12″
100	30 rooms	4′ 2″	4′ 9″	7′ 6″	6.75	16″ x 16″
200	50 rooms	4′ 2″	5′ 9″	7′ 6″	8.96	18″ x 18″
300	70 rooms	5′ 2″	4′ 9″	7′ 6″	10.00	20″ x 20″
400	150 rooms	5′ 2″	5′ 9″	7′ 6″	13.45	22″ x 22″
500	300 rooms	6′ 2″	5′ 9″	8′ 6″	17.95	24″ x 24″

Intake Door Data

Goder intake doors are of the *self-closing bucket type.*

Features found desirable during a long incinerator experience, are incorporated in the design.

Neutral gray vitrified enamel is the standard finish for doors and frames.

We recommend our 10⅝x11-in. size as standard for all incinerators.

Larger sized doors can be furnished upon request.

KELLOGG MANN CORPORATION

Combustion Engineers and Manufacturers of K-M Incinerators
Designers and Manufacturers of Garbage and Waste Disposal Equipment for Heavy-Duty Requirements

GENERAL OFFICES
37-39 Franklin Street, BUFFALO, N. Y.
NEW YORK OFFICE: 60 East 42nd Street

ENGINEERING

Complete and odorless refuse destruction can be achieved only through experienced engineering. Each installation presents a problem which should be reviewed by a specialist. In this way, the many inexcusable mistakes of cheap or faulty installations —poor dehydration, deficient top air, improper combustion chambers, lack of consideration of the nature and amount of refuse, etc., will be avoided—and incineration will receive the recognition it deserves.

K-M INCINERATOR

KELLOGG MANN CORPORATION are engaged *solely* in designing and manufacturing all types of low and high temperature incinerators. Both K-M standard products and special designs are thoughtfully engineered. K-M Engineers are combustion specialists, experienced in solving unusual or difficult problems of waste incineration; thoroughly competent to design, build and install special equipment. Architects, engineers, and builders are invited to consult us on any unusual problems of design or construction involving waste disposal.

PRODUCTS

K-M INCINERATORS, CHIMNEY-FED, BASEMENT-FED, OUTDOOR TYPES. Seven standard models and many special designs. For residences, apartments, schools, smaller hospitals, institutions, office buildings, country estates, parks, etc. Operate with or without auxiliary fuel. Principles of incineration and construction described below.

SUPER MANN DESTRUCTALL for heavy duty high temperature work. Designed to meet individual requirements of industrial plants, larger hospitals, schools and institutions, restaurants, hotels, markets, etc. New design effective either where additional fuel is necessary or where no fuel is required as in the case of burnable refuse. Equally effective to destroy any combination of *unsorted* wet and dry refuse; built of modern materials in accordance with latest high temperature practice.

Also Crematory for human remains of advanced design and outstanding quality; silent, odorless, and effective. For detailed information write our Engineering Department.

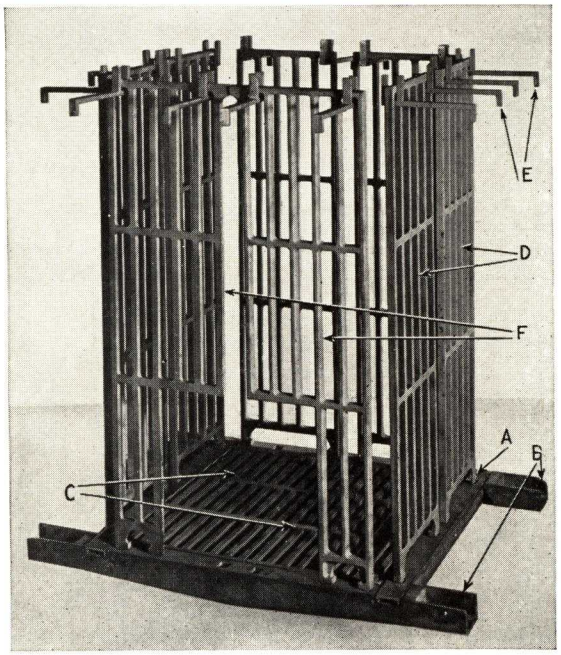
A STURDY, EXCEPTIONALLY EFFICIENT INCINERATOR

For All Types of Buildings

K-M Incinerator—General Description

An incinerator to be efficient must be designed to perform two highly important functions. First, to rapidly and thoroughly dehydrate wet garbage and refuse. Second, to produce complete combustion. Both these functions are dependent on adequate draft. K-M Engineers have long recognized that a thorough dehydration of wet garbage was absolutely necessary for the complete combustion required to obtain odorless destruction of waste matter. With this in mind, they designed the combustion chamber into which the refuse is fed with a suspended basket arrangement of grates and a blast furnace top to insure maximum draft at all times.

This construction utilizes the draft to the utmost, resulting in thorough drying, complete and odorless burning, and easy ash removal. No auxiliary fuel is required, except where there is a preponderance of wet garbage.



The Exclusive K-M Patented, Suspended Basket Arrangement of Grates with Combustion Chamber and Doors Removed

Sustaining members, A, interlock with heavy, supporting members, B, which are embedded in the combustion chamber wall, to form a support for the horizontal grates, C. The vertical grates, F and D, are supported on the bottom by the members, B and A, and guided on top by the lugs, E. All parts are made of high quality, low phosphor, low sulphur cast iron. Note their great thickness and strength and their design to withstand terrific heat without cracking and warping.

Features and Advantages

(1) Patented Suspended Basket Type of Construction—A system of vertical grates entirely lining the combustion chamber, excepting space occupied by cleanout doors, with a 2-in. space between grates and side walls, permits the charge of mixed wet and dry refuse to be suspended in the combustion chamber with a powerful draft circulating on all sides. This construction has outstanding advantages.

(2) Sanitary Treatment Decaying Garbage—The air space between vertical grates and side walls prevents wet garbage from piling up against the brick walls, and sticking fast to them, thus eliminating obnoxious odors from the decaying mass.

(3) Quick Drying—The air space between vertical grates and fire wall provides a channel for fast moving air on all four sides of wet refuse producing the greatest possible evaporation and quick drying between burnings.

The side grate construction gives the K-M five times greater dehydration area than incinerators employing horizontal grates only—a feature of greatest possible importance.

(4) Complete Odorless Combustion—When charge of refuse is ignited the constant stream of air drawn up through air space on all four sides of combustion chamber and through refuse spread on grates, enables entire mass to be enveloped in flame. Rapidly rising temperature builds up a powerful draft. Gases and odors liberated from garbage beneath pass up through flames and are consumed. Complete combustion results.

(5) Extends Life of Fire Brick Lining—Fire brick is porous. Vertical grates protect this lining. Moisture absorbed by the bricks from the wet garbage causes formation of steam in brick pores when combustion takes place. This materially reduces its life and eventually necessitates expensive relining job.

(6) Insures Odorless Combustion Chamber—Vertical grates prevent porous fire brick from absorbing decaying garbage. Lining does not foul and give off obnoxious odors.

(7) Sturdy Cast Iron Construction—Both vertical and horizontal grates are of heavy section supported on four strong cast iron supporting members. Size of parts increase as size

of combustion chamber increases. No exposed steel members are used to support roof or grates. Steel members exposed to flame overheat, resulting in expensive failure.

(8) No Dumping—Clean Ash Pit—The stationary, yet removable horizontal grates eliminate dumping and avoid the possibility of the ash pit filling up with unburned refuse which shuts off the draft so essential to the drying process. No garbage remains in the ashes.

(9) Grates Will Not Warp, Clog or Crack—Since the grates are of the non-dumping, stationary type, they never give trouble by clogging or warping. Hot ashes cannot be dumped to come up against the grates and burn them out if ash pit is full.

(10) Nothing to Get Out of Order—Simple, sturdy construction. No bearing blocks, nuts, bolts, shakers, handles; no moving parts, no mechanism to get out of order or interfere with continuous operation.

(11) Easy to Remove Ashes and Unburnables—The fire door is set flush with horizontal grates, not above them, as in many machines. The unburnables are then raked into a receptacle. Assures much easier cleaning of grates and substantial labor saving.

(12) All Parts Easily Removable—To remove the vertical grates it is only necessary to lift them from the supporting hooks—the horizontal grates are easily lifted from their sustaining pieces. It is just as simple to replace them.

(13) Corbelled-in Roof Construction—Corbelling facilitates maximum draft and proper dehydration and combustion. *It also provides space vital to complete combustion above the refuse,* thereby eliminating odors from flue gases.

TYPICAL SPECIFICATION

The contractor shall furnish all masonry, material and labor, including fire brick, and all metal Incinerator parts to install complete where shown on the plans .....
1, 2, etc.
Model ..... K-M Incinerator(s), having .....
SR, R, etc. 1, 2, etc.
Receiving Hopper Door(s) of..... size,
7x7"; 8½x10½"; 12½x13½"
.....type, ... design.
Polished Solid Aluminum Ship, Windmill, etc.
or C. I. Aluminum Primed

Incinerator(s) shall be installed in strict accordance with the directions of the manufacturers, the KELLOGG MANN CORPORATION, 37-39 Franklin Street, Buffalo, New York.

DIMENSIONS AND CAPACITIES OF 7 STANDARD "K-M" INCINERATORS

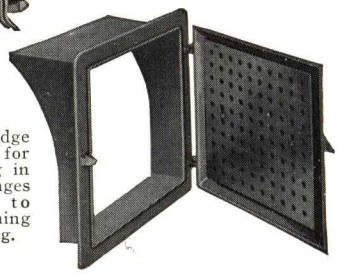
Series model	Capacity	Outside dimens., ins.			Inside dimens., ins.		Flue size, ins. (inside)
		X	Y	Z	P	Q	
SR	Residences up to 6 rooms	38	38	78	20	20	*12x12
R	Residences up to 10 rooms; Apartments 3 2-bedrooms or 4 1-bedroom.	48	48	80½	30	30	*12x12
LR	For residences up to 16 rooms; For apartments up to 40 rooms Outdoor installations — Parks, Camps, etc.	53	53	91	35	35	16x16
SA	For apartments up to 60 rooms Small institutions Country estates	60	48	91	42	30	18x18
A	Apartments up to 90 rooms Hospitals up to 60 beds Schools up to 700 pupils	68	68	95	42	42	18x18
LA	Apartments up to 160 rooms Hospitals up to 85 beds Schools of 700 to 1000 pupils	80	68	106½	54	42	20x20
H	Apartments up to 240 rooms Hospitals up to 125 beds Schools 1000 to 1500 pupils Small hotels, etc.	80	80	106½	54	54	22x22

*On SR and R, if two or more hopper doors are used, flue must be 16x16 in.

Typical Clean-Out Doors

Double Leaf Clean Out Door (Open)

Doors are carefully fitted and are smoke and odorproof. Handles are wire, designed not to get hot by air-cooling.

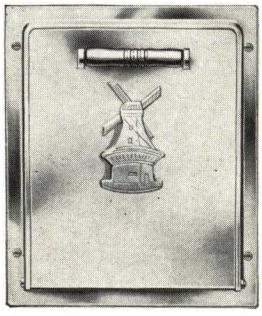


Right:
Frame is wedge shaped and deep for secure anchoring in masonry and hinges are balanced to make easy opening and sealed closing.

Single Leaf Clean Out Door (Open)

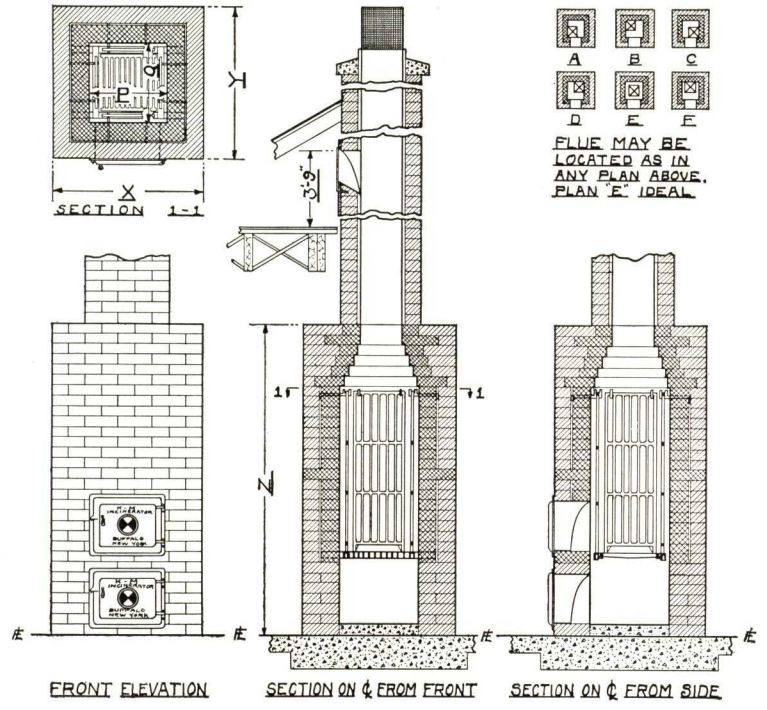
Details of these doors deserve more than a passing glance. Notice unusual thickness of them all. Offset constructions of door make it stronger. Baffle plate makes it last longer, more heat-resistant as well as draft equalizing. Lip keeps out fire glare.

Typical Receiving Doors



Aluminum Receiving Door

Receiving hopper doors are well constructed and have specially designed air-cooled handles; are available in smooth grained cast iron, or aluminum, highly polished, and with any of three raised decorative designs on their surface which contributes to beauty of any kitchen. Hopper buck is of heavy cast iron construction assuring secure anchoring in chimney.



Detail of Typical Installation

(Full sized blue prints of any K-M models may be had on request either from the factory or your K-M distributor)

KERNER INCINERATOR COMPANY

Originators of Flue Fed Incineration
3551 North Richards Street
MILWAUKEE, WIS.
BRANCH OFFICES AND AGENCIES IN 150 CITIES

GENERAL AND CONSTRUCTION NOTES

Incinerator Chamber

The chamber is lined with fire brick from the grate level up to and including the inner course of the top.

Chimney Support

Roof steel furnished with incinerator is *not* designed for support of chimney. Where walls of chimney are not carried from floor to floor, *structural support* of flue walls above incinerator roof *must be provided, by others.*

Flue

The flue for Flue-Fed Models must be carried up *plumb, without slopes or offsets,* and all flues must extend high enough above any roof obstructions to avoid interference with draft.

Flues not provided with fire clay flue lining must have 4½-in. fire brick lining for a distance of not less than 30 ft. above incinerator chamber.

Note: Brick quantities given below do not include chimney above incinerator top.

Gas Burners

Auxiliary gas burners should be provided in installations where it is felt that the volume of combustible waste is at times insufficient for complete incineration of the garbage.

The Kerner Patented Burner is placed immediately above fire door, and gives a long torch-like flame that penetrates downwards into the garbage.

On Models T and J, a burner is provided as standard equipment, and a suitable burner is available for all other models.

All Flue Dimensions are inside measurements

STANDARD MODELS

Models	T	J	JI	J2	J3	J4	J5
Grates	1—16 x 16 in.	1—16 x 16 in.	1—16 x 16 in.	2—12 x 20½ in.	2—12 x 20½ in.	2—12 x 25 in.	3—12 x 25 in.
Grate area	2¼ sq. ft.	2¼ sq. ft.	2¼ sq. ft.	4¼ sq. ft.	4¼ sq. ft.	5 sq. ft.	7½ sq. ft.
Hearth area	None	1⅛ sq. ft.	2¾ sq. ft.	2½ sq. ft.	5½ sq. ft.	8½ sq. ft.	10½ sq. ft.
Total burning area	2¼ sq. ft.	3⅜ sq. ft.	5 sq. ft.	6¾ sq. ft.	9¾ sq. ft.	13½ sq. ft.	18 sq. ft.
Common brick	525	675	900	985	2410	2980	3590
Firebrick (standard)	175	225	300	385	585	740	950
Arch brick (No. 1)	None	None	None	None	6	6	6
Feather edge brick	2	2	2	2	5	5	7
Fire doors	T	J	JA-S	JA-S	JB-S	JB-S	JC-S
Ash doors	T	T	T	J	J	J	J
Cubic capacity	7¾ cu. ft.	11½ cu. ft.	17½ cu. ft.	25¼ cu. ft.	39 cu. ft.	59 cu. ft.	86 cu. ft.
Capacity (bushels)	6 bu.	9 bu.	14 bu.	20 bu.	31 bu.	47 bu.	68 bu.

FIRE AND ASH DOORS

	Style	Opening	Weight
Standard fire and ash doors (no air box or baffle)	T	13¾ x 9½ in.	15 lbs.
	J	16 x 12 in.	24 lbs.
Standard fire doors (with air box)	JA-S	17½ x 14½ in.	55 lbs.
	JB-S	22 x 17 in.	86 lbs.
	JC-S	29½ x 22 in.	130 lbs.

	Style	Opening	Weight
Special fire doors (with baffle)	JA-B	17½ x 14½ in.	52 lbs.
	JB-B	22 x 17 in.	82 lbs.
	JC-B	29½ x 22 in.	125 lbs.

Note—All fire and ash door dimensions are width by height. Weights of doors are without lintels.

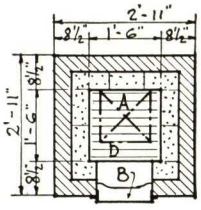
SPECIAL MODELS

Models	Heavy Duty Type J	Small Retort	Large Retort	Heavy Duty Retort
Grates	Stationary bars	2—12 x 20½ in.	3—12 x 25 in.	Stationary bars
Grate area	7½ sq. ft.	4¼ sq. ft.	7½ sq. ft.	10 sq. ft.
Hearth area	7 sq. ft.	4¾ sq. ft.	11½ sq. ft.	9 sq. ft.
Total burning area	14½ sq. ft.	9 sq. ft.	19 sq. ft.	19 sq. ft.
Common brick	2950	1370	3525	3260
Firebrick (standard)	790	800	1660	1540
Arch Brick (No. 1)	46	None	25	112
Feather edge brick	8	4	8	10
Jamb brick	32	17	25	23
Fire doors	JC-S	1 JA-S and 1 JB-B	1 JB-S and 1 JB-B	1 JC-S and 1 JB-B
Ash doors	J	2T	2-J	2-J
Cubic capacity	65 cu. ft.	27 cu. ft.	58 cu. ft.	58 cu. ft.
Capacity (bushels)	52 bu.	21 bu.	46 bu.	46 bu.

SUGGESTED ARCHITECTS' SPECIFICATIONS UNDER MASONRY

The contractor shall furnish all masonry, material and labor—including fire brick, and all metal incinerator parts to install complete where shown on the plans..... Model.....Kerner Air-Torch Incinerator(s), together with.....Type.....Size.....Hopper Doors, all in strict accordance with the
(Quantity) (A, B or C) (33 or 55)
installation drawings furnished by the KERNER INCINERATOR COMPANY.

STANDARD LAYOUTS



Model T

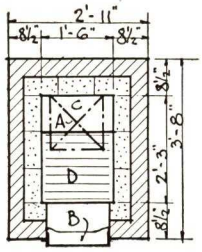
For Residences—Up to 6 rooms.

Flue Size—12x12 in. if small (Size 33) hopper door is used on first floor only. 16x16 in. if hopper door is used on second floor.

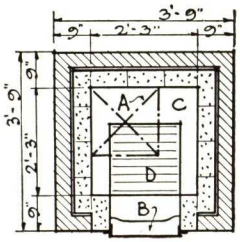
HEIGHT OF INCINERATOR—6 ft. 1 in. above floor. Top of footings figured 1 in. below floor level.

Model J

For Residences—Up to 8 rooms.



Model J1-L (J1-R Flue opposite side)



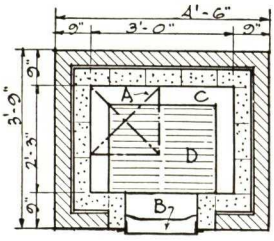
For Residences—Up to 10 rooms.

For Apartments—Up to 24 rooms.

Flue Size—12x12 in. in residences if small (Size 33) hopper door is used on first floor only. 16x16 in. if hopper door is used on second floor. 16x16 in. for apartment buildings 4 stories or less, if small (Size 33) hopper doors are used, 18x18 in. if large (Size 55) hopper doors are used and for all buildings up to 6 stories.

HEIGHT OF INCINERATOR—6 ft. 2 in. above floor. Top of footings figured 1 in. below floor level.

Model J2-L (J2-R Flue opposite side)

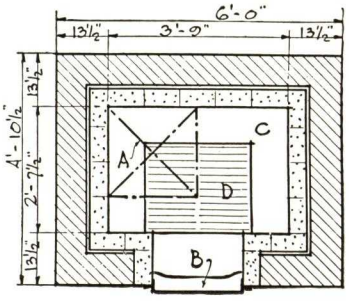


For Residences—Up to 12 rooms.

For Apartments—Up to 80 rooms.

Flue Size—16x16 in. in residences and for other buildings 4 stories or less if small (Size 33) hopper doors are used. 18x18 in. if large (Size 55) hopper doors are used and for all buildings up to 6 stories. 22½x22½ in. for all buildings over 6 stories. HEIGHT OF INCINERATOR—6 ft. 4½ in. above floor. Top of footings figured 1 in. below floor level.

Model J3-L (J3-R Flue opposite side)



For Apartments—Up to 140 rooms.

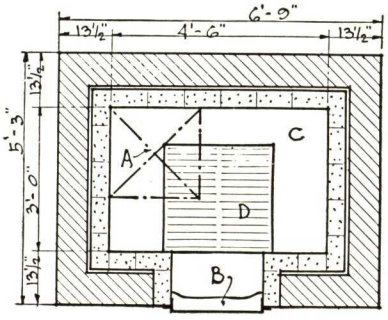
For Hospitals—Up to 60 beds.

For Schools—Up to 800 pupils.

Flue Size—22½x22½ in. for buildings over 6 stories; 18x18 in. for buildings 6 stories or less.

HEIGHT OF INCINERATOR—7 ft. 1 in. above floor. Top of footings figured 1 in. below floor level.

Model J4-L (J4-R Flue opposite side)



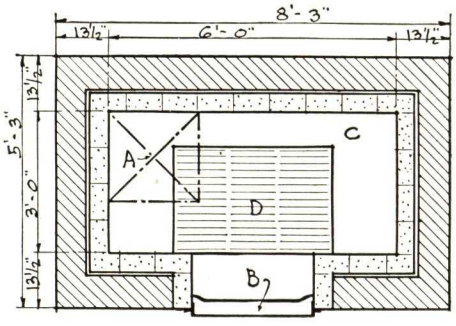
For Apartments—Up to 200 rooms.

For Hospitals—Up to 80 beds.

For Schools—Up to 1,000 pupils.

Flue Size—22½x22½ in. for buildings over 6 stories; 18x18 in. for buildings 6 stories or less. HEIGHT OF INCINERATOR—7 ft. 6 in. above floor. Top of footings figured 1 in. below floor level.

Model J5-L (J5-R Flue opposite side)



For Apartments—Up to 300 rooms.

For Hospitals—Up to 125 beds.

For Schools—Up to 1,500 pupils.

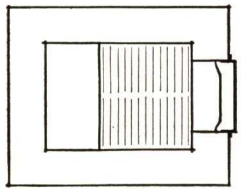
Flue Size—22½x22½ in. for buildings over 6 stories; 18x18 in. for buildings 6 stories or less.

HEIGHT OF INCINERATOR—7 ft. 11 in. above floor. Top of footings figured 1 in. below floor level.

Modified Layouts

Standard layouts are flexible to some extent and can be modified to suit particular plan conditions.

End Charging



Rectangular models can be arranged for end operation, as shown, where space conditions and limits make use of standard layouts impossible.

Direct Fed Models

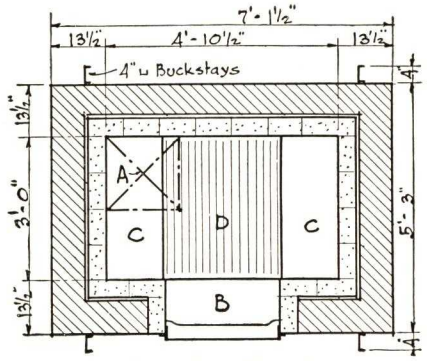
Any model can be used as a Direct Fed Incinerator, either with the flue extending up from the top of the incinerator chamber or connected by a breeching to an adjoining flue.

For Hopper Doors and Special Models See Pages 3 and 4.

Index to Parts

A—Chimney flue
B—Fire and ash doors
C—Firebrick hearth
D—Dumping grates
Scale—¼ in. = 1 ft.

SPECIAL LAYOUTS



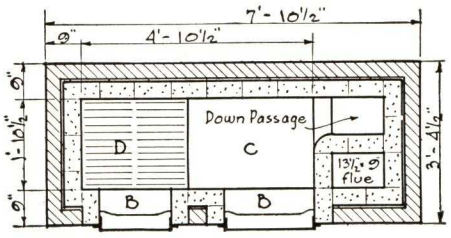
Heavy Duty Type J

Height of incinerator 7 ft. 8½ in.

Heavy Duty Type J

The Heavy Duty Type J Incinerator is built to withstand higher temperatures than is usually encountered in burning residential or general apartment house waste. It has fire brick arched roof construction, and is reinforced with buckstays and tie rods. Grates are the heavy stationary bar type.

Can be either flue-fed or direct-fed.



Small Retort

Height of incinerator 6 ft. 4½ in.

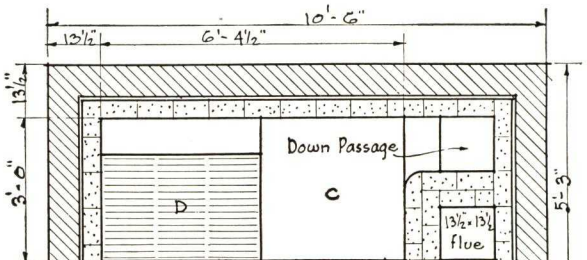
Retort Type

The Retort Type Incinerator is not flue-fed. It is designed to handle situations where large proportions of garbage or other wet waste make it necessary to charge the wet and dry waste separately for proper burning.

The miscellaneous dry waste is burned as the fuel on the grate section of the incinerator, the flames and hot gases from which pass over a fire brick hearth where the wet waste is placed for incineration. The gases then travel downwards to a secondary combustion chamber below the hearth, where further combustion of the gases takes place before passing up the flue.

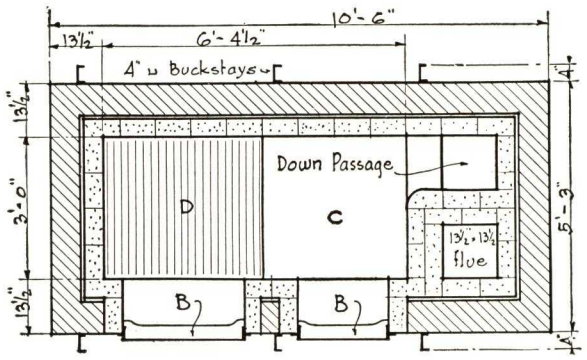
When the amount of miscellaneous dry waste is not sufficient to provide the necessary fuel, additional fuel such as wood or coal must be burned on the cast iron grates.

The Retort Type is built in three models: Small, Large and Heavy Duty. The Heavy Duty model has fire brick arched roof construction, and is reinforced with buckstays and tie rods. The grates are the heavy stationary bar type.



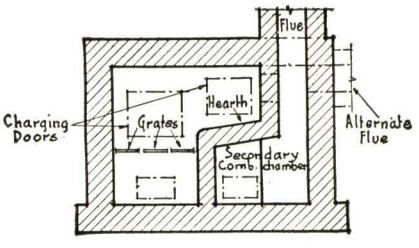
Large Retort

Height of incinerator 6 ft. 11½ in.



Heavy Duty Retort

Height of incinerator 7 ft. 1 in.

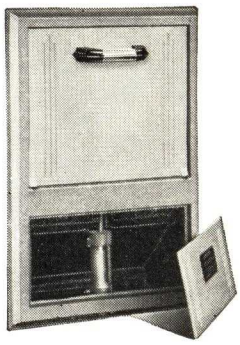


Typical Section

In all cases where the requirements to be met appear to indicate the use of Special Equipment we suggest that the particular problem be submitted to either the nearest Kerner Representative or the Home Office for consideration.

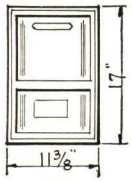
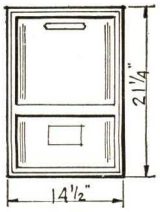
HOPPER DOORS

Type A

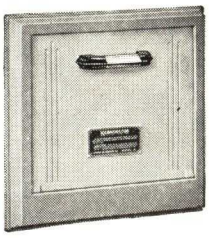


(Silent and Self-closing)

This door is automatically closed by spring action. Closing is cushioned by a dashpot located in an air cooled chamber, below the doors.

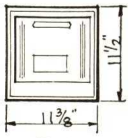
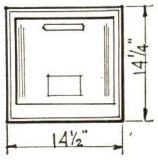
	Size 33	Size 55
		
	A-33	A-55
Daylight opening	8¾ x 7¾ in.	11½ x 10 in.
Depth of wall frame.....	6½ in.	9 in.

Type B

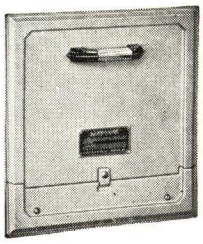


(Standard)

Identical with Type A door except for lower panel and silent, self-closing features.

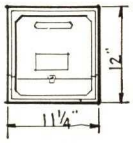
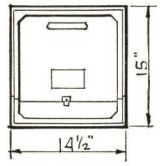
	Size 33	Size 55
		
	B-33	B-55
Daylight opening	8¾ x 7¾ in.	11½ x 10 in.
Depth of wall frame.....	6½ in.	9 in.

Type C



(Low Cost Type—Without Casing)

Not as attractive in appearance as Types A and B, but just as rugged and serviceable.

	Size 33	Size 55
		
	C-33	C-55
Daylight opening	9 x 9 in.	12 x 11 in.
Depth of wall frame.....	6½ in.	9 in.

Size 55 cannot be used on flues with minimum dimensions less than 18x18 in. Where building is over 6 stories in height, flue should be larger than 18x18 in. — See Standard Layouts (page 2) for proper flue sizes.

Size 33 hopper door may be installed in a 12x12-in. flue if door is located on the first floor. Flue of larger dimensions must be used if more than one door is specified.—See Standard Layouts (page 2) for proper flue sizes.

Types A and B are painted in two-tone gray enamel finish. Type C is painted in one shade of gray enamel. (Types A and B are available in chromium plated finish at additional cost.)

Height above floor to bottom of wall frame should be determined by architect. Most convenient height is 2 ft. 4 in.

Extra Large (Projecting Type) 1A3 Hopper Door is available for commercial use. Daylight opening 14½x11½ in. This door requires a flue not less than 22½x22½ in.

All Flue Dimensions are inside measurements

MORSE BOULGER DESTRUCTOR COMPANY

202-A East 44th Street, NEW YORK, N. Y.

AGENCIES IN ALL PRINCIPAL CITIES

HEAVY-DUTY INCINERATION
MORSE BOULGER DESTRUCTORS

The Product

HEAVY DUTY DESTRUCTORS for heavy duty service in the incineration of:

(1) Hotel, hospital and institutional waste.
(2) Store and office building waste.
(3) Municipal garbage and rubbish.
(4) Sewage screenings and sludge.
(5) Industrial refuse.
(6) Elimination of obnoxious fumes.
(7) Removal of insulation from scrap wire.
(8) Cremation of human remains.

Morse Boulger Destructors

More than 1000 Morse Boulger Destructors have been built and are in daily operation in all parts of the world, burning almost every conceivable type of waste.

Morse Boulger Destructors are of the brickset, high temperature type and only materials which have been proven by years of service to be particularly adapted to incineration work are used. Every Morse Boulger Destructor built is guaranteed against defects in material and workmanship and carries a permanent guarantee as to capacity and correctness of design.

Standard Types

Type "R"—Designed for heavy duty, high temperature incineration of combustible rubbish in warehouses, stores, railroad yards and factories. This type may be used for water heating and generating steam where sufficient quantities of refuse are available.

Type "M"—Designed especially for the disposal of garbage and rubbish in large cities. This destructor makes use of preheated forced draft air supply and extra large settling and combustion chambers in order to destroy the refuse at temperatures above 1400° F. This type is especially valuable if a city desires to produce power.

Type "G"—Designed for use in smaller cities and towns or in hotels, hospitals and institutions where there are large quantities of very wet garbage and little dry rubbish. This type is especially efficient for use where coal, oil or gas is to be used as auxiliary fuel.

Type "A"—Designed for apartment houses, schools, apartment hotels, markets and bakeries where the proportions of garbage to rubbish is nearly equal. This destructor will burn rubbish only or rubbish mixed with garbage or garbage only may be burned by adding fuel.

Type "E"—Designed for use where space is limited and the quantities of refuse small. This type is particularly useful in small apartment houses, stores, institutions and markets.

Type "S"—Designed for the incineration of very wet sewage screenings or industrial wastes that are reluctant to burn.

Type "F"—Designed for the burning of fumes in paint factories or chemical plants. This unit will remove the insulation for copper wire without smoke and will return a bright metal.

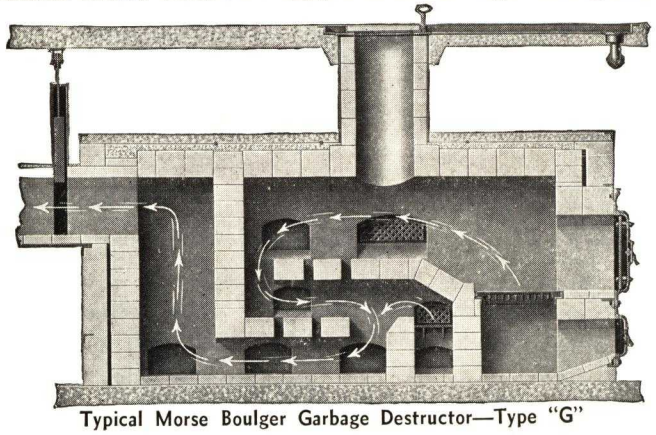
Type "U"—Designed for the incineration of combustible refuse as collected in smaller industrial and commercial establishments.

Crematories—Designed to give dignity to the building and to the service it is to render the public. From the time the casket is placed in the cool receiving vault to the presentation of the ashes in the urn no unpleasant odors, sound, or smoke is evident.

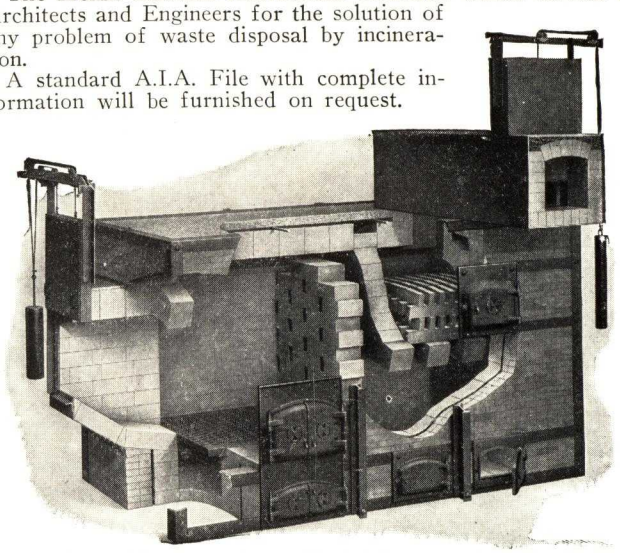
Service

The MORSE BOULGER DESTRUCTOR COMPANY offers service to Architects and Engineers for the solution of any problem of waste disposal by incineration.

A standard A.I.A. File with complete information will be furnished on request.



Typical Morse Boulger Garbage Destructor—Type "G"



Typical Morse Boulger Rubbish Destructor—Type "R"

DIMENSIONS AND CAPACITIES OF SMALL STANDARD MORSE BOULGER DESTRUCTORS

Type "G" for Garbage					Type "R" for Combustible Rubbish					Types "A," "E" and "U" for Rubbish and Garbage				
Model No.	Capacity, lb. per hr.	Dimensions, ft. in.			Model No.	Capacity, lb. per hr.	Dimensions, ft. in.			Model No.	Capacity, lb. per hr.	Dimensions, ft. in.		
		Length	Width	Height			Length	Width	Height			Length	Width	Height
1½-G	160	9—0	4—7	5—7	2-R	205	7—0	5—3	6—8	1¼-A	125	7—4	4—0	5—3
2 -G	215	10—9	4—7	5—7	3-R	288	8—0	5—3	7—6	2 -A	200	8—6	4—0	5—8
3 -G	340	12—9	6—0	6—7	4-R	400	11—0	5—6	7—6	3 -A	300	9—4	4—7	6—1
4 -G	430	14—0	6—0	6—7	5-R	480	12—3	6—0	8—0	4 -A	450	10—2	5—2	7—4
5 -G	520	15—6	6—0	7—0	6-R	630	13—0	6—6	8—0	6 -A	600	12—5	5—6	7—9
6½-G	660	17—0	6—0	7—3	7-R	700	14—0	6—6	8—0	"E"	90	5—1½	4—10	5—6
8 -G	815	18—0	6—6	7—7	8-R	800	14—0	7—0	8—0	"U"	75	4—11	2—11	5—8

Note: Working space at least equal to width of destructor is necessary on one side and is desirable on one end.
For clearances, sizes of flues and breechings, permissible length of charging chutes, etc., send for detailed information on any particular project.

C. CARLTON PARKER CO.

Manufacturer of Amherst Incinerators

608 Lafayette Avenue

BUFFALO, N. Y.

NEW YORK OFFICE: THE EXPANDED METAL ENGINEERING CO., 523 West 33rd Street

The Amherst Brickotype Incinerator

Convenience and Simplicpty—The Amherst Brickotype Incinerator is a built-in incinerator consisting of a combustion chamber lined with fire brick and equipped with special grates. This machine has a history of ten years of successful operation without departure from the basic principles employed at the time of its inception, and is backed by 50 years' experience in the manufacture of incinerators, furnaces and stoves. The principle used is the same simple, long established principle used in furnaces, namely, *a fire will burn better if the air goes through and into the base of the material to be burned.* We have made many tests on other methods and have found none as good.

Amherst Incinerator is equipped with flat stationary grates, providing more space in the combustion chamber and eliminating the necessity of removing the dumped material from the ash pit. The portable grates are laid on the grate frame and require no bolts to assemble. Grates are on a level with the cleanout door enabling easy removal of non-combustible articles. The patented automatic air port introduces secondary air when and as needed. All openings into the incinerator are screened against flies. A baffle grate beneath the flue keeps materials from collecting in a compact mass.

Automatic Air Port—A feature individual with the Amherst Brickotype Incinerator is the automatic air port located about 3 ft. above the grates. The flutter valve in the air port controls the supply of oxygen over the top of the fire preventing too much draft when the fire is burning intensely and when the incinerator is not burning, directing the air into and through the material to be dried preparatory to burning.

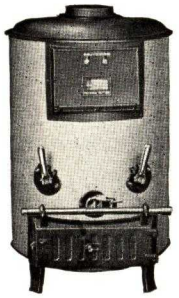
Hopper Doors—An attractive cast aluminum hopper door is placed in the wall of the kitchen or hall on the floor or floors above the incinerator. This hopper is in the flue of the incinerator which flue acts as a chute for the disposal of the garbage as well as a flue to carry off the combustion from the incinerator. The entire edge of the hopper door is packed with asbestos to prevent leakage as well as to prevent the metallic slam of the door. By preventing this leakage at the hopper more air is drawn through the material to be dried and burned, threby providing greater incinerator efficiency. Furthermore, smoke will not leak out around the hopper doors in case of a stoppage of the flue or a back draft. Both of these features are very important.

Floor Receiving Doors—The same incinerator can be installed in an old or remodeled residence using flues (except fireplace flues inconveniently located to receive wall hoppers). This contemplates the use of our special floor receiving door, so that all refuse can be disposed of without going into the basement or out doors. This cast aluminum floor door operates with a disappearing treadle and is guaranteed to be sanitary and smokeproof. The same mechanical features of efficient drying and burning are incorporated in this type of incinerator.

Various Installations and Sizes—The Amherst Brickotype Incinserator can be adapted to any space due to the multiple unit grate construction. The design is such that the cost of installation in both labor and material has been reduced to a minimum. Also made as heavy duty destructor with gas burners, for hospitals, etc.

The Sanotype Portable Incinerator

The No. 7 Sanotype was built to meet the demand for a low priced, durable and efficient gas burning incinerator. This machine represents years of experience in all types of gas burning incinerators. Complete information will be sent upon request.

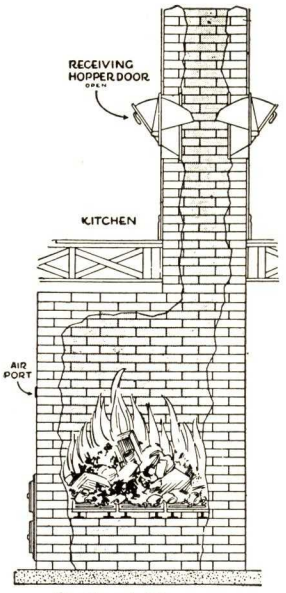


No. 7 Sanotype Portable Incinerator

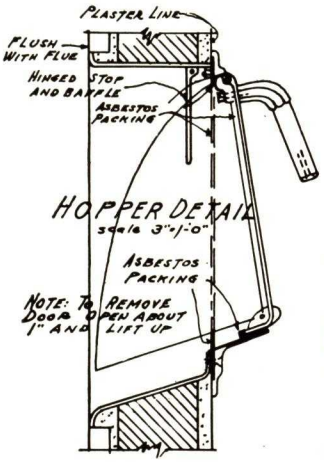
SCHEDULE OF SIZES

Type	Grate area, sq. ft.	Dimensions "X"	Dimensions "Y"	Cap., bu.
24	4	1′ 7″	3′ 0½″	18
26	6¾	1′ 7″	4′ 6¾″	28
36	6¾	2′ 4″	3′ 0½″	28
46	6¾	3′ 1″	2′ 3½″	28
28	9	1′ 7″	6′ 1″	38
48	9	3′ 1″	3′ 0½″	38
39	10	2′ 4″	4′ 0¾″	42
410	11¼	3′ 1″	3′ 9¾″	47
510	11¼	3′ 10″	3′ 0½″	47
312	13½	2′ 4″	6′ 1″	57
412	13½	3′ 1″	4′ 6¾″	57
612	13½	4′ 7″	3′ 0½″	57
414	15¾	3′ 1″	3′ 4″	66
714	15¾	5′ 4″	3′ 0½″	66
515	16¾	3′ 10″	4′ 6¾″	70

Types 510, 612, 714, 515 have two sets of cleanout and ash pit doors.



Sectional Diagram



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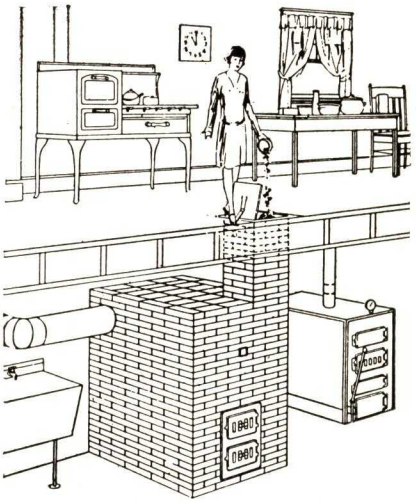
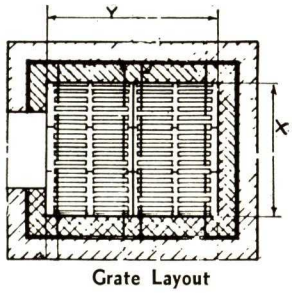


Floor Hopper Door Installation



Grate Layout

Amherst Incinerator standard layouts below show the square foot grate requirements for various sized buildings. Where the same square foot area is available in more than one type of incinerator use the type most adaptable to the conditions in the building.

Where more than one hopper door is used the flue should not be less than 16 x 16 in., because of the danger of flue stoppages.

Square ft. of grate	Residences	Schools	Apartments	Flue
4	Up to 10 rooms		Up to 20 rooms	12″x12″
6¾	14 rooms		80 rooms	12″x12″
9	20 rooms		90 rooms	16″x16″
10			130 rooms	16″x16″
11¼		800 pupils	160 rooms	18″x18″
13½		1000 pupils	200 rooms	18″x18″
15¾		1200 pupils	250 rooms	18″x18″
16¾		1500 pupils	300 rooms	18″x18″

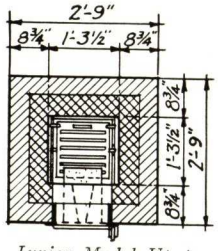
MEMORANDA

PITTSBURGH INCINERATOR COMPANY

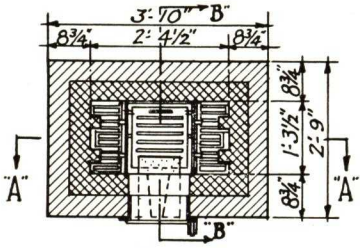
PITTSBURGH, PA.

NATION WIDE DISTRIBUTION

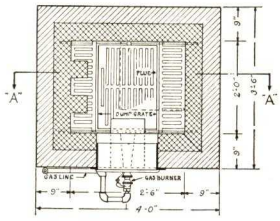
PITTSBURGH BUILT-IN-THE-CHIMNEY FLUE-FED INCINERATORS (PATENTED)



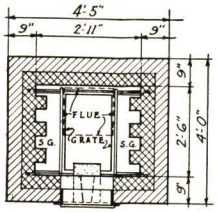
Junior Model Up to 6 Rooms



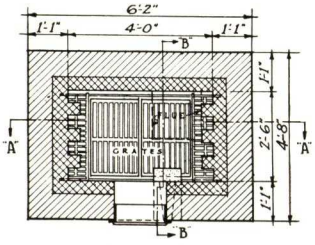
Type "H" For Larger Homes and Duplexes



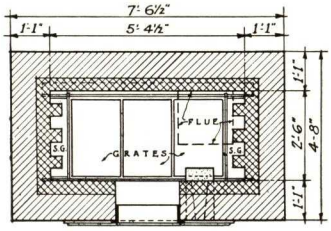
Type 4 FA 4-Family Apartment



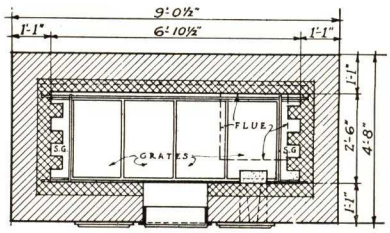
Type "A" Up to 15 Apartments



Type "AA" Up to 25 Apartments



Type "AAA" Up to 50 Apartments



Type "AAAA" Up to 100 Apartments

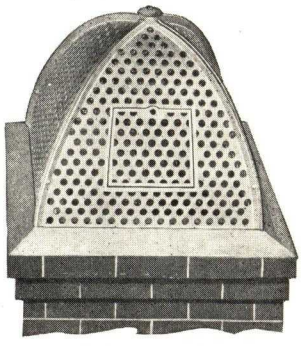
SPECIFICATIONS OF FLUE FED INCINERATORS

Model or Type	Combustion chamber outside—over all, in.			Combustion chamber inside, in.			Approximate brick to build		Minimum flue lining size, in.	Shipping weights, lb.	Doors, in.	
	Depth	Width	Height	Depth	Width	Height	Fire	Red			Fire	Ash
Junior	33	33	72	15½	15½	45	175	450	13x13	250	9x12	9x12
Type H	33	46	76	15½	28½	49½	250	575	13x13	350	9x12	9x12
Type 4 FA	42	48	85	24	30	51	450	700	18x18	500	12x16	12x16
Type A	48	53	85	30	35	51	500	767	18x18	650	12x16	12x16
Type AA	56	74	85	30	48	51	600	1800	18x18	1000	12x16	12x16
Type AAA	56	90½	85	30	64½	51	660	2150	20x20	1450	20x20	12x16
Type AAAA	56	108½	85	30	82½	51	790	2425	24x24	1650	20x20	12x16

AUTOMATIC SELF-CLOSING ALUMINUM AND PORCELAIN ENAMEL RECEIVING HOPPERS

Complies with the Underwriters' requirements

Hopper No.	Daylight opening, in.		Wall flange, in.		Wall opening, in.	
	High	Wide	High	Wide	High	Wide
1	8	8½	11	14	9	17
2	9	9½	12	16¼	9½	19
3	12	12	16	23	16	27
4	12	15	19	23	19	27



Patents Pending

Durable Cast Iron Chimney Spark Arrester

The cast iron spark arrester is built for heavy duty and long duration, architecturally designed to improve the appearance of chimney tops; a vast improvement over the galvanized wire screen in appearance and lasting qualities. So constructed to cause a down swirling motion on all four sides, shunting burnt paper and sparks back into flue.

Specially designed cleanout door installed to assist in removing any obstruction that may occur.

Incinerators for All Conditions

The Pittsburgh is recognized as one of the leading incinerator companies in the country. Architects and builders will receive our full co-operation.

Pittsburgh San-A-Tor Portable and Wall Types

Self-contained and complete units delivered and shipped assembled, and can easily be installed and put in operation after a few minutes' work in the same manner as an ordinary stove.

CAPACITIES AND DIMENSIONS PORTABLE TYPE

No.	Cap., bu.	Height, in.	Floor space, in.	Ship. weight, lb.
11	1	37½	21x21	450
12	2	55	21x21	700
50	½	37½	21x21	450
15	5	60	24x32	1800

CAPACITIES AND DIMENSIONS WALL TYPE

No.	Cap., bu.	Height, in.	Width, depth, in.	Ship. weight, lb.
21	1	31½	18x18	450
22	2	49½	18x18	700
31	1	31½	18x18	450
32	2	49½	18x18	700
41	1	31½	18x18	450
42	2	49½	18x18	700
25	5	59½	24x32	1800

Flue Capacity: 1 and 2 bu., 9 in.; 5 bu., 16 in.; ¾-in. gas connection.
Fire Doors: 7¼x11¼ in. for 1 bu.; 9¼x11¼ in. for 2 bu.; 12x16 in. for 5 bu.

Commercial and Industrial Units

Designed for the destruction of garbage, rubbish and combustible waste materials. Capacities 1 to 6 tons. Plans and specifications of destructors furnished on request.

For larger designs and municipal plants, capacities ranging from 6 to 600 tons, address *The Pittsburgh-Des Moines Steel Co., Neville Island Station, Pittsburgh, Pa.*

THE PYRONEEL CO.

DIVISION OF J. C. ROCHESTER & CO., INC.

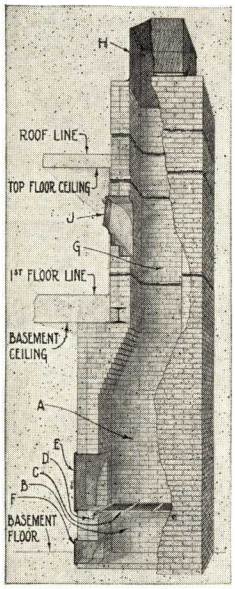
370 Lexington Avenue

NEW YORK, N. Y.

PYRONEEL INCINERATORS

Full-Grate *Flue-Fed*

The Pyroneel principle of incineration was introduced in 1930. While not a radical departure from the methods of former years the Pyroneel refinements, considered innovations then, have proven to be accepted standards of today. PYRONEEL stresses dehydration—a major function equal in importance to combustion. In planning with equal care for both functions Pyroneel has produced the closest approach today to odorless free-burning incineration.



SECTIONAL VIEW

A—Combustion Chamber
B—Ash Pit
C—Removable Grates
D—Grate Supports
E—Fire Door
F—Ash Door
G—Flue
H—Spark Screen
J—Hopper Doors

Note: Hopper Doors "J" for depositing refuse into the flue-chute may be installed on each floor of the building.

How to Specify Size

TABLE 1. BUSHEL RATING

Model No.	Basement Ceiling Heights					Each add'l. 6 in.
	7 ft.	7 ft., 6 in.	8 ft.	8 ft. 6 in.	9 ft.	
	Bushel Rating					
21	7	8	9	10	11	1
22	13	15	17	19	21	2
23	21	23	25	27	29	2
32	21	23	25	27	29	2
24	29	32	35	38	41	3
42	29	32	35	38	41	3
33	33	37	41	45	49	4
25	35	39	43	47	51	4
52	35	39	43	47	51	4
26	45	50	55	60	65	5
62	45	50	55	60	65	5
34	45	50	55	60	65	5
43	45	50	55	60	65	5
35	52	58	64	70	76	6
53	52	58	64	70	76	6
44	55	62	69	76	83	7
36	60	67	74	81	88	7
63	60	67	74	81	88	7
45	65	73	81	89	97	8
54	65	73	81	89	97	8
46	76	86	96	106	116	10
64	76	86	96	106	116	10

First—determine the number of bedrooms in the building. The reason bedrooms are considered a reasonably accurate guide to incinerator capacity is because they are the best known factor for estimating 24-hour occupancy of the premises.

Second—if it is an apartment building consider each bedroom to have 1-bushel rating, based on incinerator being fired each night.

If a private dwelling consider each bedroom to have 3-bushel rating based on incinerator being fired twice a week—6 bushels per bedroom when fired once a week.

Third — after determining bushel rating of aggregate number of bedrooms, consult Table No. 1 at left. Select the column corresponding to ceiling height in basement. Find in this column the bushels corresponding to bedrooms. In column on extreme left of that figure is shown the proper model Pyroneel.

TABLE 2. Hopper Doors

Hopper Door Numbers and description	For flues, in.	Daylight opening, in.	Door frame, in.	Wall opening, in.	Depth of buck, in.	Extension from wall, in.
No. 78 For Residences, finished in baked ivory enamel, bakelite handle with chromium mounting.	12 x 12 12 x 16 12 x 18	7 x 7	9 x 11	7¼ x 15¾	5¾	4½
No. 99 Apartment and Residence type. Finished one coat gray enamel. To be painted on job to match wall.	16 x 16 16 x 18 18 x 18 20 x 20	8½ x 8½	11½ x 12¾	9 x 16	5¾	3¾
No. 1010 Apartment and Residence type. Finished one coat gray enamel. To be painted on job to match wall.	16 x 16 16 x 18 18 x 18 20 x 20	9 x 9¼	11½ x 12	10⅛ x 13¼	6	Flush
No. 1112 Heavy duty Apartment and Hotel type. Finished one coat gray enamel. To be painted on job to match wall.	18 x 18 20 x 20 24 x 24 30 x 30 and larger	10½ x 11¼	16¾ x 16¼	12 x 25	9¾	3½

Counterweights can be furnished on all doors.

Automatic door-checks can be furnished on doors 99 and 1112.

Pyroneel Advantages

(1) Twenty-two sizes meeting all requirements.
(2) All draft forced through entire garbage mass.
(3) Corbeled roof eliminates framing for flat roof.
(4) Grates removable through fire-door in case of breakage.
(5) Lintels cast integral with fire and ash door.
(6) Fixed grates, eliminating smoldering unburned matter in ash-pit.
(7) Simple and effective draft control.
(8) A minimum of moving parts reducing operating care to a minimum.
(9) Clean ashes suitable for garden use.

Flues

Flue may lead up from any corner of combustion chamber. Local building ordinances may govern size and type of construction of flues but we give herewith the following data which experience has taught us to be good approved construction practice.

For apartment buildings within fire zones, flues should consist of two thicknesses of common brick and one inner course of fire brick for 30 ft. above top of combustion chamber. Above that point, two courses of common brick with or without flue lining.

For residences, or buildings outside of fire zones, flues should consist of two courses of common brick for entire height with terra cotta flue lining or fire brick for the first 30 ft. above top of combustion chamber.

TABLE 3. RECOMMENDED FLUE SIZES

Incinerator model numbers	Flue size, in. I. D.	CHIMNEY HEIGHT, FT.	
		Minimum	Maximum without expansion chamber
21, 22 (when only one hopper door is to be used)	12 x 12	—	—
21, 22, 23, 24, 32, 42	16 x 16	30	65
25, 26, 33, 34, 43, 52, 62	18 x 18	50	70
34, 35, 36, 43, 44, 45, 54, 63	20 x 20	60	70
35, 36, 44, 45, 46, 54, 63, 64	24 x 24	100	120

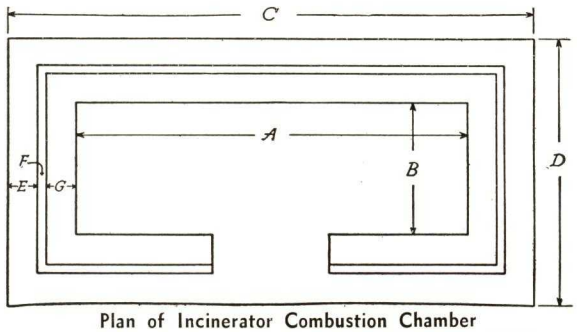
Note: Considerable latitude may be exercised in the selection of flue sizes. The above are only suggestions. We can furnish draft regulators if certain control of chimney currents cannot be effected by flue size.

Where only one hopper door is used, flue should not be less than 12 x 12-in. inside diameter. Where more than one hopper door is used, buildings 6 stories or less should have flue not less than 16 x 16-in. inside diameter, over 6 stories, not less than 18 x 18-in. inside diameter. Hopper door daylight opening should not exceed one-third the inside area of the flue.

Combustion Chambers

A—Inside width
B—Inside depth
C—Outside width
D—Outside depth
E—Common brick
F—Air space
G—Fire brick

Footings should extend at least 6 in. beyond dimensions C and D.



Plan of Incinerator Combustion Chamber

Table No. 4 gives plan dimensions of all 22 models of Pyroneel. The height is governed by basement ceiling height. No roof steel is required in Pyroneel Incinerators, as corbelling is designed to carry across from combustion chamber walls to flue walls. Our working drawings furnished with each Pyroneel gives accurate details and dimensions of combustion chamber for mason contractors guidance. In no case do we estimate or furnish steel members for support of chimney, as this is governed by height of building and other factors that may not be known to us. Neither can we specify exact thickness of footings under combustion chamber as we know nothing about local soil conditions. However, we recommend a minimum of 6-in. thickness and 6 inches beyond combustion chamber walls for all footings.

TABLE 4

Table 4 shows 13-in. walls for all models. However, The National Board of Fire Underwriters permit 9-in. walls for models having 9 sq. ft. grate area or less.

Model	Grate area, sq. ft.	Dimensions on plan above						
		A, ft.	B, ft.	C, ft.–in.	D, ft.–in.	E, in.	F, in.	G, in.
21	2	2	1	4–2	3–2	8	½	4½
22	4	2	2	4–2	4–2	8	½	4½
23	6	2	3	4–2	5–2	8	½	4½
32	6	3	2	5–2	4–2	8	½	4½
24	8	2	4	4–2	6–2	8	½	4½
42	8	4	2	6–2	4–2	8	½	4½
33	9	3	3	5–2	5–2	8	½	4½
25	10	2	5	4–2	7–2	8	½	4½
52	10	5	2	7–2	4–2	8	½	4½
26	12	2	6	4–2	8–2	8	½	4½
62	12	6	2	8–2	4–2	8	½	4½
34	12	3	4	5–2	6–2	8	½	4½
43	12	4	3	6–2	5–2	8	½	4½
35	15	3	5	5–2	7–2	8	½	4½
53	15	5	3	7–2	5–2	8	½	4½
44	16	4	4	6–2	6–2	8	½	4½
36	18	3	6	5–2	8–2	8	½	4½
63	18	6	3	8–2	5–2	8	½	4½
45	20	4	5	6–2	7–2	8	½	4½
54	20	5	4	7–2	6–2	8	½	4½
46	24	4	6	6–2	8–2	8	½	4½
64	24	6	4	8–2	6–2	8	½	4½

We also manufacture Basement-Fed, Down-Draft, and Estate Type Incinerators.
Pyroneels are applicable to schools, hospitals, hotels and clubs. Your inquiries are invited.

E. C. STEARNS & COMPANY

Manufacturers of Built-in and Portable Incinerators

SYRACUSE, N. Y.

THE BUILT-IN INCINERITE

The problem of disposing of garbage and waste, most efficiently, without odor and at a minimum of expense, has been solved effectually for the modern home and apartment building, by the Stearns Built-in Incinerite.

The Incinerite — IT SOLVES THE PROBLEM

Many years of tests and experience have proven the correctness of the Stearns Incinerite design and construction. It has been built from the standpoint of long service. No weakening of important points has been permitted just to effect the saving of a few cents in manufacturing cost. The roof steel as supplied is complete as well as of proper weight and strength. The hopper and fire doors are of a quality and weight of metal that will resist the heat to which they will be subjected.

The Stearns Built-in Incinerite differs from all other equipment of this kind in its correctly positioned and proportioned auxiliary draft control as well as in the permanent checker-work wall at the side of the combustion chamber. Rapid and adequate pre-drying of an accumulated charge is followed by complete and odorless combustion because the combustion chamber has been designed with provision for a definite—instead of an accidental or casual—distribution of air above and below the horizontal grates.

The Stearns auxiliary draft control admits outside air above the horizontal grates independently of the volume of air that must be admitted under these grates. This auxiliary, above-grate air, is distributed to the charge through a permanent, checker-work, fire brick wall. The air thus admitted is preheated and may be regulated in volume as required, both during pre-drying and during burning. In this way, the best conditions for maximum speed in drying and for most efficient combustion, may be quickly established for each installation.

Independently regulated over-grate air is essential to perfect incineration without odor or smoke. It is permanently provided for in the Stearns construction by the checker-work fire brick wall, which requires no upkeep expense. The Stearns Incinerite is characterized throughout its entire construction by the weight and durability of all its parts.

All the details of construction as well as all working drawings and specifications relative to its erection, conform with the requirements of the National Board of Fire Underwriters.

Installation Details

We provide large scale blueprints with each installation, showing all details of construction and with complete specifications for erection. For conditions that require a modification of any of the standard designs or for special installations, we will gladly furnish specially drawn plans and recommendations.

Foundation

Foundations or footings for the incinerator chamber should be of concrete and extend 6 in. beyond the outer sides of the walls.

Chimney Construction

Chimneys measuring 16 x 16-in. or less may be enclosed by common brick 3¾-in. thick and lined with standard fire clay chimney lining. Chimneys larger than 16 x 16-in. must be lined with fire brick 4½-in. thick for a distance of not less than 30 ft. above roof of the combustion chamber, the fire brick lining being enclosed with common brickwork 3¾-in. thick. Above this point the chimney may consist of common brickwork not less than 8-in. thick, which may be lined with standard fire clay chimney lining, if desired.

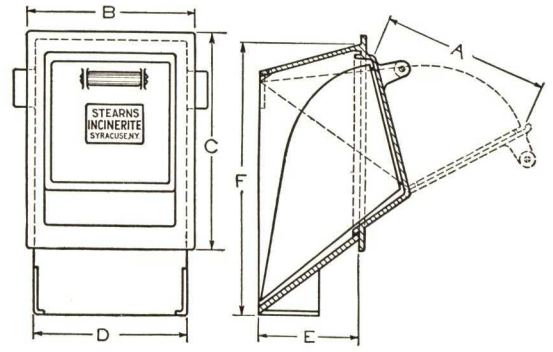
Chimney Screens

Chimney screens or spark arresters must be set on top of the chimney cap and fastened to the cap or sides of the chimney by masonry nails.

Hopper Doors

Hopper doors may be installed on any side of the chimney and may be located at the most convenient points within the building, subject to the condition that there be no offsets or slopes on the inside of the chimney below the topmost door.

Below we show a front and side diagram of the Stearns Incinerite hopper doors, together with detailed measurements of both Standard and Flush-type doors.

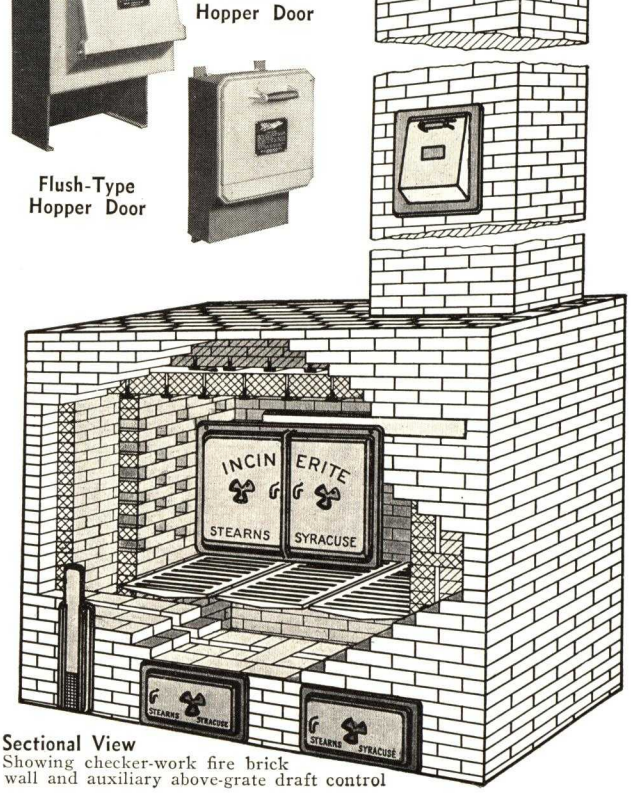


HOPPER DOOR DIMENSIONS

Door sizes	A-opening	B	C	D	E	F	Minimum flue size
Standard Type							
No. 0	6½"x10"	9½"	9¾"	8¼"	5"	11¾"	12"x12"
No. 1	8¾"x10¾"	11¼"	14½"	10¼"	6¾"	18¼"	12"x12"
No. 2	11½"x15½"	16"	19½"	13¼"	9½"	24"	16"x16"
No. 3	15½"x18½"	18¼"	21¾"	16¼"	9¾"	26¼"	20"x20"
Flush Type							
No. 4	8½"x10"	10 9/16"	11 5/16"	9"	6¾"	14½"	12"x12"
No. 5	10" x11½"	12½"	13"	10 9/16"	6¾"	15½"	12"x12"

Standard Hopper Door

Flush-Type Hopper Door

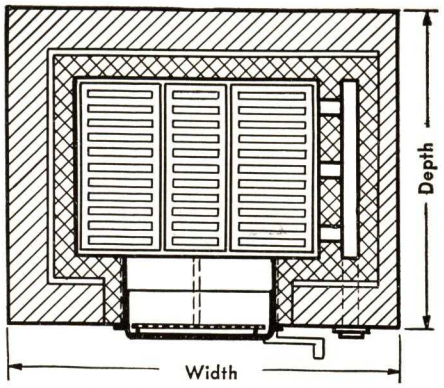


Sectional View
Showing checker-work fire brick wall and auxiliary above-grate draft control

FLOOR PLAN LAYOUTS (STANDARD BUILT-IN TYPES)

DIMENSIONS AND CAPACITIES BY SIZES

No.	Width	Depth	Standard height	Bushels capacity	Grate area	Grates
1	3′9″	3′7″	6′3″	8½	3 sq. ft.	1—18″x24″
2	4′3½″	3′7″	6′3″	11	4 sq. ft.	2—12″x24″
2½	4′9½″	3′7″	6′3″	14	5 sq. ft.	1—18″x24″ 1—12″x24″
3	5′3½″	3′7″	6′6″	18	6 sq. ft.	2—18″x24″
3½	5′3½″	4′1″	6′6″	22½	7½ sq. ft.	2—18″x30″
4	5′10″	3′7″	6′6″	21	7 sq. ft.	1—18″x24″ 2—12″x24″
5	5′3½″	4′7″	6′6″	27	9 sq. ft.	2—18″x36″
6	6′9″	5′5″	8′0″	48	12 sq. ft.	1—12″x36″ 2—18″x36″
7	7′3″	5′5″	8′0″	54	13½ sq. ft.	3—18″x36″
8	9′2″	5′5″	8′0″	72	18 sq. ft.	4—18″x36″



Typical Section Above Grates

APPLICATION OF UNITS BY SIZES

No. 1 —For 8-room residences. Flue size 12x12 in.

No. 2 —For 10-room residences. Flue size 12x12 in.

No. 2½—For 14-room residences, 4-family apartments, or up to 24 rooms. Flue size 12x12 in. for residences; 16x16 in. for apartments.

No. 3 —For 20-room residences, 6-family apartments, or up to 32 rooms. Flue size 12x12 in. for residences; 16x16 in. for apartments.

No. 3½—For 8-family apartments or up to 50 rooms. Flue size—under 4 stories, 16x16 in.; 4 stories or more, 20x20 in.

No. 4 —For 8-family apartments or up to 50 rooms. Flue size—under 4 stories, 16x16 in.; 4 stories or more, 20x20 in.

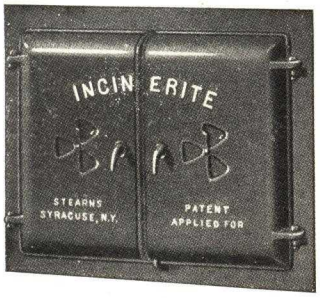
No. 5 —For 12-family apartments or up to 90 rooms. Hospitals—35 beds. Schools—500 students. Flue size—under 4 stories, 16x16 in.; 4 stories or more, 20x20 in.

No. 6 —For 18-family apartments or up to 130 rooms. Hospitals—35 to 60 beds. Schools—500 to 800 students. Flue size—under 7 stories, 20x20 in.; 7 stories or more, 24x24 in.

No. 7 —For 24-family apartments or up to 175 rooms. Hospitals—60 to 85 beds. Schools—800 to 1200 students. Flue size—under 7 stories, 20x20 in.; 7 stories or more, 24x24 in.

No. 8 —For 40-family apartments or up to 300 rooms. Hospitals—85 to 125 beds. Schools—1200 to 1500 students. Flue size 24x24 in. or larger.

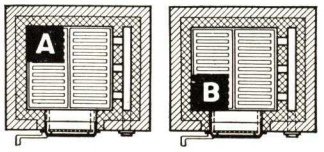
FIRE DOORS
Built for Service



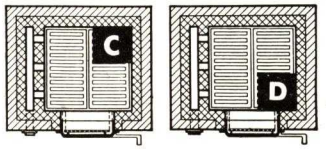
DIMENSIONS AND DATA

Fire Doors	No. 1 (single leaf)	No. 2 (single leaf)	No. 3 (double leaf)
Size	11″x20″	18″x22″	22″x30″
Brick opening	11⅝″x20⅝″	18¾″x22¾″	22¾″x30¾″
Used on Incinerite	Nos. 1, 2, 2½, 3	Nos. 3½, 4, 5	Nos. 6, 7, 8

Chimney and Grate Positions

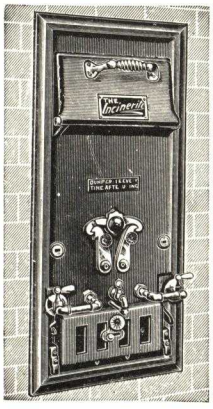


All sizes of the INCINERITE are made for each of the standard chimney positions as shown here. Orders should specify the chimney position as well as size.



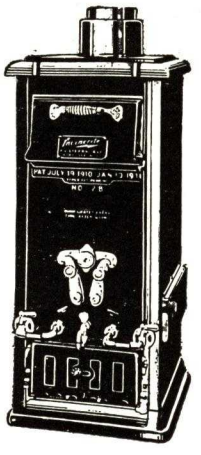
PORTABLE AND WALL TYPE INCINERATORS

Gas Fired



There are numerous forms of so-called "portable" as distinguished from built-in incinerators available. These vary greatly in design and construction—likewise in price. Many of them will burn paper or readily combustible waste, others can dispose of garbage and wet waste in moderate amounts—if liberally diluted with dry material of high fuel value. A very few are actually capable of satisfactorily solving the ever-present household problem of disposing of a daily accumulation of wet garbage.

The Stearns Incinerite—either portable or wall type—completely and permanently solves the problem once it is installed because it really does what an incinerator is intended to do—it burns garbage quickly, completely and without odor. The Stearns Incinerite is a tested and proven unit—not to be compared with make-shift or flimsily constructed affairs built primarily to sell at a price. The Stearns Incinerite with its heavy cast iron firebox will stand up under long use and give the service that equipment of this type should give, even under the hardest usage. It will dispose of a maximum charge of waste with a minimum consumption of gas or other fuel.



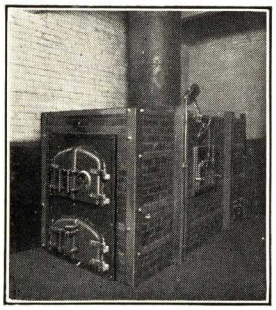
Complete dimensions and weights of these units will be provided on application

WASHBURN & GRANGER, INC.

MANUFACTURERS OF

Dean Incinerators, Crematories, Can Washers, Rubbish Chutes, Waste Heat Hot Water Heaters, Gas Washers, Boiler Grates and Floor Grids

53 Park Place, NEW YORK, N. Y.



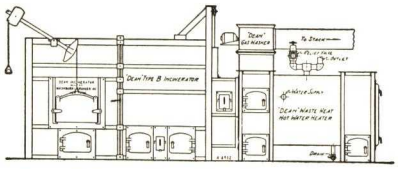
Dean Type A Incinerator

Dean Type A Incinerator

Designed to burn garbage and other refuse in varying percentages from 100% garbage down to 20%. Used in hotels, hospitals, institutions, bakeries, civilian or army camps, small towns, restaurants, railroad stations, produce terminals, public markets, etc. Wood, coal, coke, gas or oil used as auxiliary fuel.

Capacities from 100 to 2000 lbs. per hour. Send for descriptive literature.

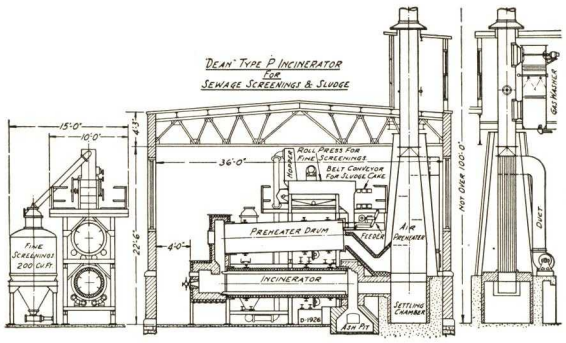
We also build the *Dean Garbage Can Washer* which should be installed with all incinerators where the garbage is brought to the incinerator in cans. See detailed specifications below.



Dean Waste Heat Hot Water Heater

Dean Waste Heat Hot Water Heater

Dean Waste Heat Hot Water Heater may be attached to any Dean Incinerator as shown in cut above. Capacity 500 gal. water per hour 100° F. temperature rise. Also Dean Gas Washer (see above) to collect fly ash and reduce gas temperatures to 250° F. Space requirements for complete installation, including Type B incinerator, 30 ft. long, 17 ft. wide, with 11 ft. 6 in. headroom. Send for descriptive literature.



"Dean" Type P Incinerator

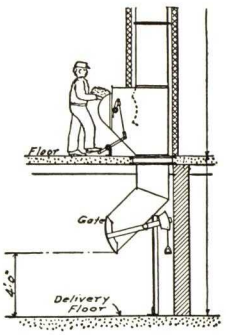
A mechanically operated incinerator for drying and burning fine sewage screenings and filtered sludge cake. Capacity 2000 lbs. per hour 75% wet material. Also adapted to drying and burning processed waste material with a large percentage of moisture.

"Dean" Type T Incinerator

Built to burn garbage, combustible refuse, filtered sludge cake and fine sewage screenings. Space required for installation 26 ft. 0 in. high, 39 ft. 0 in. wide, 27 ft. 0 in. deep. Suitable for town with 6000 population.

Dean Rubbish Chute

Standard size 24½x24 in. inside. Plain sections are made of 14-gauge blue annealed sheets with flanged connections; intake sections are 10-gauge and intake opening is 14½ in. high by 24 in. wide, has a positive seal at all times and is foot operated. Discharge gate at bottom of chute is the self-closing cut-off type, complete with lever, counterweight and operating handle.

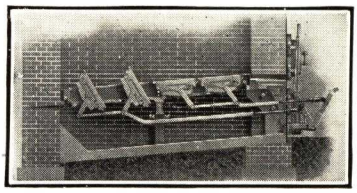


Dean Rubbish Chute

Dean Dumping Grates

Built for burning small sizes of anthracite coal with either natural or forced draft. Bars tip in tandem to angle of 65° and are supported at both ends by a rectangular frame which eliminates entirely tendency of the bars to hang downward on the ends. Air spaces ⅛ to ⅜-in. slot and also built in the pinhole form with ¼ or $\frac{5}{16}$-in. diameter openings. Fires can be cleaned in one-half the time required with stationary bars.

Complete automatic forced-draft systems installed in connection with these grates for burning rice or barley coal. Write us for prices.

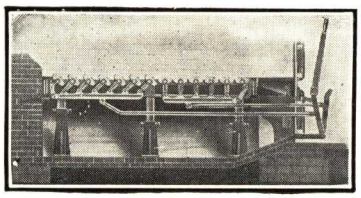


Dean Dumping Grate

Dean Shaking Grates

Used for bituminous and larger sizes of anthracite coal, both fuels requiring a grate with an oscillating or shaking movement. Supported by a frame resting on the ashpit floor independent of the brickwork with bars placed on 8-in. centers, allowing ample opening for largest clinkers. Journals self-locking requiring no caps. Sides of the bars are made solid which is a necessity as ninety per cent of the wear comes along these edges. Construction is of the most durable form to withstand hard service.

Catalogue No. 10 on request.



Dean Shaking Grate

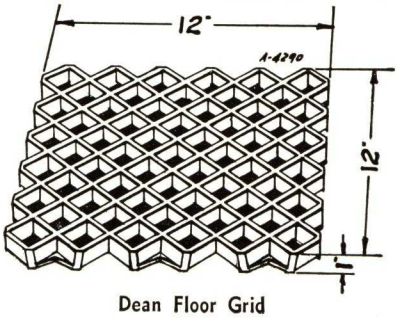
Dean Cast Iron Grids for Flooring

General Uses—Used extensively in milk plants, loading platforms, boiler rooms, printing plants, warehouses, driveways, receiving and heavy storage areas; traffic aisles, garage and other ramps, and wherever the need for a floor which will withstand for years continuous heavy shocks without breaking up or needing costly repairs.

Made in One-foot Square Sections—Each section occupies 1 sq. ft. of floor space. This size is conveniently handled and quickly laid; gives the finished installation the best possible anchorage, and maximum flexibility in expansion and contraction.

How to Specify—Furnish and set Dean Floor Grids as made by Washburn & Granger, Inc., New York, N. Y., to cover area as per specifications and drawings. Each section to occupy 1 sq. ft. and to be approximately 1 in. thick.

On the rough concrete floor lay a thin bed of 1-to-2 cement and sand mortar. Set each section in this bed so that each piece is level with all others on all sides. After this mortar has set, pour the finish mortar, including cement hardener, over the sections and level off so that cement is flush with top of grids.

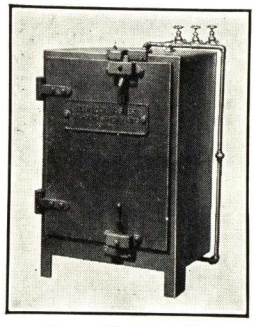


Dean Floor Grid

Dean Garbage Can Washer

How to Specify—Furnish and place in the building where shown on the plan (s) *One* (1) *Garbage Can Washer* as manufactured by Washburn & Granger, Inc., New York.

Height 4 ft. 3 in. above the floor line, width 2 ft. 7 in., depth 2 ft. 9¼ in. inside. Washer to be of welded construction of 11-gauge steel, fitted with brass spray nozzles top and bottom. Door to be of cast iron, equipped with a rubber gasket on the inside and two quick opening latches on the outside. Furnish and mount on top of can washer one ½-in. cold water, one ½-in. steam and one ¾-in. hot water brass globe valves together with piping between the upper and lower connections. Furnish suitable removable drain cover. Leave the can washer ready for ½-in. cold water, ½-in. steam, ¾-in. hot water and 4-in. cast iron soil pipe drain connections, by others.



Dean Can Washer

PYROFAX DIVISION, CARBIDE AND CARBON CHEMICALS CORPORATION

(UNIT OF UNION CARBIDE AND CARBON CORPORATION)

Carbide and Carbon Building
30 East 42nd Street, NEW YORK, N. Y.

PYROFAX GAS SERVICE FOR LOCATIONS NOT SERVED WITH CITY GAS

Used Wherever Gas Is Required

Pyrofax Gas Service supplies gas for cooking and other domestic purposes to country and suburban residences which are not served with city gas. It is also suitable for schools, colleges, industrial plants, hospitals and other institutions.

Pyrofax Gas Is Real Gas

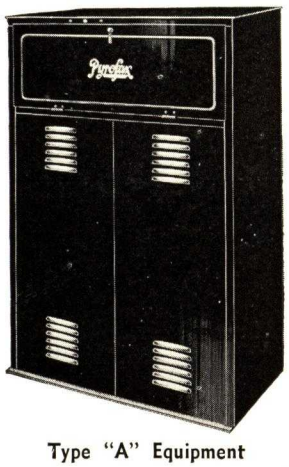
Pyrofax Gas is delivered to the customer in steel cylinders under sufficient pressure to cause the gas to liquefy and thus permit a comparatively small cylinder to hold the equivalent in heat units of approximately 5700 cu. ft. of city gas. The gas is conveyed through piping to gas-burning appliances as a true gas, and not as a liquid such as kerosene or gasoline. It is non-toxic, non-poisonous and uniform in composition. Pyrofax burns with a clear blue flame free from soot or odor. "Pyrofax" is a trade mark belonging exclusively to Carbide and Carbon Chemicals Corporation.

Two cylinders are furnished for each installation; one is in reserve while the other is in use.

Pyrofax Equipment

There are two types of Pyrofax Equipment available. Type "A" Cabinet Equipment consists of regulating equipment and connections for two cylinders of Pyrofax Gas completely housed in a green enameled steel cabinet. Type "T" Equipment consists of regulating equipment and connections for two cylinders of Pyrofax Gas with separate housing for each cylinder. An automatic device is available which turns on the reserve cylinder of gas when the one in use becomes exhausted. This includes a signal which indicates when the changeover is made. Thus a continuous supply of gas is provided without attention.

Type "A" Cabinet Equipment is 57 ins. high, 37 ins. wide and 19 ins. deep, and is placed outside the house, on a weatherproofed wooden base supplied with the equipment. Type "T" Equipment is 37 ins. wide, 20 ins. deep, 55 ins. high when closed and 60 ins. high when open. This equipment is also placed outside the house on a weatherproofed wooden base supplied with the equipment. Copper tubing or standard gas pipe is used to convey Pyrofax as a gas (not a liquid) to the appliances. Piping is exactly the same as for city gas, except shellac should be used on joints and all unions should be of ground seat type.



Type "A" Equipment

Type "T" Equipment

Installation of Pyrofax Equipment

Installation will be made by the local Pyrofax distributor. The distributor will, upon request, quote his charge for installation by his trained service men.

All Gas Appliances Will Operate with Pyrofax

Leading types of gas ranges, built expressly for Pyrofax, are guaranteed by the manufacturer to be capable of efficient and economical operation.

Laundry stoves, water heaters, refrigerators, and other similar gas burning appliances can be secured adapted by the manufacturer for use with Pyrofax. In large homes and institutions, hotel equipment is used.

Because Pyrofax contains five times as many heat units per cubic foot as city gas, smaller orifices are inserted in the gas cocks, and the burners are raised to approximately $\frac{9}{16}$ to $\frac{7}{8}$ in. from the cooking top on properly Pyrofax-adapted appliances. These adjustments are made at the manufacturer's factory.

Underwriters' Laboratories Listing

Pyrofax is listed as "standard" by the Underwriters' Laboratories of the National Board of Fire Underwriters. This means that a Pyrofax installation, when made in accordance with rules of the National Board of Fire Underwriters, should not increase the insurance rate to the householder.

Installation and Operating Costs

Type "T" Pyrofax Gas Regulating Equipment is furnished to the consumer without charge. The initial cost of delivering, assembling and installing this equipment is $9.75—payable to the Pyrofax distributor. Type "A" Cabinet Equipment is available at a slightly higher price. Good gas ranges are available at $50.00 up. The cost of cooking with Pyrofax for the average family of four ordinarily is $3.00 to $4.00 per month. Lower rates are available for increased consumptions when the family is larger or when additional appliances, such as a refrigerator or water heater, are used.

Specifications for Architects' Use

The following should be included in the plumbing specifications under the gas piping section:

> This contractor shall have installed where shown on the architect's plans, one standard Type .... Pyrofax Gas Equipment manufactured by Carbide and Carbon Chemicals Corporation of 30 East 42nd Street, New York, N. Y.
>
> Gas piping shall be of the sizes shown and located as indicated on the detail drawing (specify as for city gas). Shellac should be used on pipe threads and unions should be ground seat type. Piping shall be connected by (the local Pyrofax distributor) to the fixtures and all necessary adjustments on these fixtures for burning Pyrofax Gas shall be made by (local Pyrofax distributor).

All appliances specified elsewhere in the specifications should be ordered from the Pyrofax distributor, adapted for use with Pyrofax Gas.

The standard Pyrofax Equipment has sufficient capacity for all ordinary purposes. For larger loads, two or more equipments are supplied.

A National Gas Distribution Service

Carbide and Carbon Chemicals Corporation and associated companies maintain more than 600 plants, warehouses and sales offices throughout the United States and Canada to serve thousands of Pyrofax users.

Write to the Pyrofax Division, Carbide and Carbon Chemicals Corporation, 30 East 42nd Street, New York, N. Y., for the name of the nearest distributor.

PHILGAS DEPARTMENT, PHILLIPS PETROLEUM CO.

General Motors Building
DETROIT, MICH.

NEW YORK, N. Y., 1 Wall Street

BARTLESVILLE, OKLA., Phillips Building

AN EXACT DUPLICATION OF CITY GAS—BEYOND CITY GAS MAINS

Modern and Economical

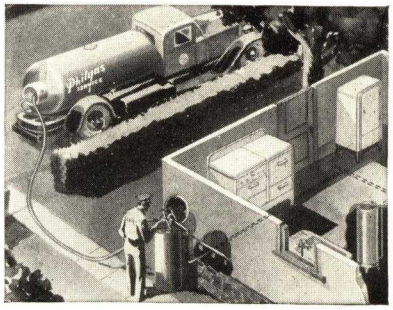
Philgas Service is an *exact duplication* of city gas service. The customer uses Philgas and the modern gas appliances just as if connected with city gas lines—never has to order fuel, or manipulate equipment. There are no tanks to change and a *continuous,* dependable gas supply is maintained by Philgas Service without interrupting the use of gas, without requiring the attention of the user, and without entering the customer's home or place of business. Continuity of the gas supply permits the safe and convenient use of fully automatic appliances. To carry the parallel of city gas service to completion, the user of Philgas is billed at monthly intervals for the exact amount of gas consumed—*after* it is used.

Real Gas

Philgas is real gas—a hydrocarbon commonly found in natural gas and known commercially as propane (C_3 H_8). The gas is treated in special plants to remove impurities and compressed to a liquid state for economy in shipping and distribution. Propane resumes its gaseous state *automatically* when relieved of pressure and is not to be confused with gasoline, kerosene and similar fuels which are normally liquid, and which must be artificially gasified before being burned. Philgas is piped into the house as a gas, and is used in the same manner as natural or artificial gas in all types of gas appliances.

Complete Service

Philgas is shipped in special tank cars to the many Philgas distributing stations. From the distributing stations Philgas is delivered at regular intervals in special tank trucks to the customer's installation. At the customer's home, consumption during the previous period is accurately determined and the gas supply replenished from the tank truck.



This service is performed without any attention from the customer and without interrupting the use of the gas at any time. Philgas is always ready at the turn of a valve.

Universal Applications

The uses of Philgas are as varied as are the applications of gas heat. Among the great variety of common appliances used with Philgas are:

Cooking ranges
Hot water heaters
Electrolux refrigerators
Laundry hot plates, Mangles
Coffee urns
Restaurant ranges
Gas brooders
Gas incubators
Melting pots
Bunsen burners
Steam tables
Singeing and drying torches
Radiant type heaters
Clothes pressing machines

Approved Appliances

Philgas is much higher in heat content and of different chemical constituency than artificial or ordinary natural gas, and therefore has different combustion characteristics. For these reasons only those appliances which have been designed and constructed especially for use with propane gas are recommended.

To insure maximum efficiency and minimum operating costs for the user, PHILGAS DEPARTMENT "lists" as acceptable for connection, only these appliances which have been tested and

approved for *propane usage* by the American Gas Association Testing Laboratory. Such appliances are built by leading appliance manufacturers of the country. Consult the local Philgas office before specifying appliances.

Low Operating Costs

As with city gas the cost of operation depends exactly on amount of gas used by customer. Considering the efficiency of approved appliances, Philgas for cooking compares to city gas of average 530 B.t.u. content at about $2.00 per thousand cubic feet, or to electricity at 2¢ per kw. hr. for the average domestic consumer. For automatic water heating and refrigeration the new low Philgas rate compares to 530 B.t.u. city gas at approximately $1.00 per thousand cubic feet. Tens of thousands of satisfied users have found Philgas operating costs to be equal or less than those of much less convenient fuels.

Installation Only $9.75

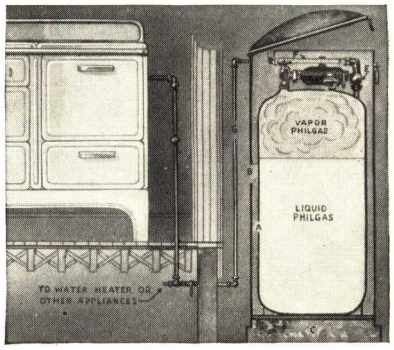
For $9.75 the company delivers and installs all Philgas equipment necessary to supply customer's appliances. The charge includes the labor of installing up to 30 ft. of piping from the Philgas equipment to appliances. *Buried installations can be furnished for an extra charge.* Equipment and piping remain property of the company.

Underwriters' Listing

Philgas Service equipment has been tested and listed as "Standard" by the Underwriters' Laboratory of the National Board of Fire Underwriters, and consequently has no effect on insurance rates.

Typical Philgas Installation

The installation is very simple. It consists of a steel cylinder (A) inside of a cylindrical metal cabinet (B), located outside customer's home or place of business. The entire installation stands on a concrete base (C). Resting on top of the steel cylinder is a regulator (D) which maintains a constant pressure of 11 in. of water on gas entering the house. (E) is safety valve set at 1-lb. pressure. From the safety valve the gas passes through flexible hose (F) and thence through standard gas



piping or copper tubing (G) to appliances inside the house. The metal cabinet is kept under lock and key.

As gas is consumed in range or heater, more Philgas automatically resumes its natural gaseous state in the cylinder, passes through the regulator and gas piping into appliance burners. Nothing to wear out or get out of order.

Data and Information

Two different sizes of gas storage equipment are used at consumers' homes, depending upon the number of gas appliances installed and volume of anticipated Philgas usage. Further flexibility to meet individual requirements is provided by Philgas, at no extra charge, through the installation of more than one unit of storage equipment where justified. Consequently, if recess in wall of house or other building is planned to accommodate Philgas Service equipment, the local Philgas office should be consulted as to which size of equipment will be used and whether a multiple installation is required.

Philgas above-ground equipment cannot be completely enclosed, but may be masked by shrubbery or by removable lattice work and may be painted by user in any color desired. Original color of standard cabinet is sage brush green. Buried installations can be made at extra cost.

(1) Dimensions of "standard" size equipment (illustrated): Height of cabinet (open) 72 ins.; diameter concrete base 23 ins.; diameter cabinet 21 ins.; height of cabinet (closed) 53 ins.; minimum size of recess for one unit of equipment (if recess is to be used) 26x26x75 ins. high.

(2) "Large" size equipment requires minimum space of 36x36x70 ins. high, per unit.

(3) All Philgas storage equipment must be placed (a) outside of building (b) at least 5 ft. from any openings in building which are below the top of the equipment (c) and so as to be reached by 50 ft. of hose from nearest point which delivery truck can approach.

(4) Roads leading to installation must be of such character as to be easily accessible to trucks twelve months in the year.

(5) Piping and labor incident to installing Philgas Service is done by Company employees, and the charge for same is covered by the initial charge for Philgas Service within the limitations in respect to extra piping and other unusual conditions set forth in the Philgas Service Application.

Company reserves the right to locate Philgas equipment on customer's premises so as to require a minimum of piping to the points of use, but should customer desire a location other than the point selected by the Company, his request will be granted upon payment of any additional expense incurred.

(6) Any piping inside the building done by other than the Philgas employees must be fitted with special compounds and the work done as specified by the local Philgas manager.

Suggested Specifications

Contractor shall supply Philgas Service equipment as manufactured and furnished by PHILGAS DEPARTMENT, PHILLIPS PETROLEUM COMPANY, General Motors Building, Detroit, Mich. (or local Philgas District address), under its standard Philgas Service Application, and arrange for installation of same by Philgas at point shown in architect's plans.

All gas piping preferably to be installed by Philgas. If not, contractor must consult local Philgas office concerning pipe sizes, location of equipment, joint compound specifications, and testing arrangements.

All gas appliances must bear American Gas Association Testing Laboratory seal of approval for *propane gas.* Philgas office will furnish names of dealers handling approved appliances. Connection to appliances to be made by Philgas.

WHERE PHILGAS SERVICE CAN BE OBTAINED

Philgas Service—the exact duplication of city gas service—is supplied in eighteen districts east of the Mississippi River. Each distributing station serves a district within a radius of approximately 25 miles from the central plant. These stations are listed below, together with general description of locations. Call or write any central, division or district office for exact information on territory served.

COMMUNICATE WITH PHILGAS DEPARTMENT, PHILLIPS PETROLEUM COMPANY, at Any of the Addresses Below:

Near New York (Southwest)
Box 502, Bound Brook, N. J.
Telephone: Bound Brook 1111

Near New York (West)
Box B, Haskell, N. J.
Telephone: Pompton Lakes 896

Near New York (North)
Box 587, Mount Kisco, N. Y.
Telephone: Mt. Kisco 5174

Near Bridgeport, Conn.
Box 351, Derby, Conn.
Telephone: Derby 472

Near Madison, Wis.
Box 608, Madison, Wis.
Telephone: Badger 6499

Near Hartford, Conn.
Box 227, Windsor, Conn.
Telephone: Windsor 791

South Central Conn.
Box 485, Niantic, Conn.
Telephone: Niantic 33

Near Providence, R. I.
Box 160, Washington, R. I.
Telephone: Coventry 8

Berkshire Section—N. Y., Conn., Mass.
Millerton, N. Y.
Telephone: Millerton 1

Near Boston, Mass.
Box 119, South Sudbury, Mass.
Telephone: South Sudbury 200

Near Baltimore, Md.
Box 63, Reisterstown, Md.
Telephone: Reisterstown 218

Near Washington, D. C.
Box 266, Rockville, Md.
Telephone: Rockville 304

Near Albany, N. Y.
Box 1188, Albany, N. Y.
Telephone: Albany 8-2271

Near Utica, N. Y.
Richfield Springs, N. Y.
Telephone: Richfield Springs 137

Near Toledo, Ohio
Box 145, West Toledo Station,
Toledo, Ohio
Telephone: Lawndale 7488

Near Cleveland, Ohio
Box 491, Hudson, Ohio
Telephone: Hudson 40

Near Detroit, Mich.
Box 94, Pontiac, Mich.
Telephone: Pontiac 4154

Near Indianapolis, Ind.
Box 166, Maywood, Ind.
Telephone: Belmont 3399

For gas service in other localities under Philgas Self-service Plan—see next page.

PHILGAS DEPARTMENT, PHILLIPS PETROLEUM CO.

Philgas SELF-SERVICE

REAL GAS FOR HOMES BEYOND GAS MAINS —PHILGAS—NOW AVAILABLE IN ECONOMICAL, SMALL, EASY-TO-CARRY "PACKAGES"

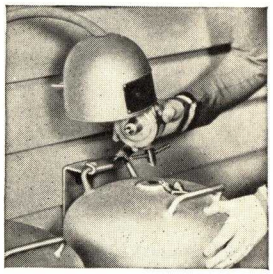
Philgas—the same modern gas fuel used by tens of thousands of families under the Philgas Service system of distribution described on preceding pages—is also available in certain areas in small, easy-to-carry packages under the Philgas Self-Service plan.

Serve Self

Local Authorized Philgas Self-Service Dealers make the installation at the consumer's home, and carry a stock of filled Philgas cylinders. The consumer replenishes his or her gas supply by exchanging empty for full cylinders at the dealer's store. The average user thus secures modern gas cooking at a lower cost than under prevailing bottled gas prices where gas delivery service to the customer's home is involved.

Easy to Handle

Each cylinder weighs approximately 42 pounds, with gas, and can be handled by a woman. Connecting or disconnecting the cylinder is as easy as screwing a cap on a glass jar—nothing complicated, no wrenches required.



Low Operating Cost

A cylinder of Philgas, costing only $1.75 in most localities, lasts the average user (for cooking) from two to four weeks. Most users are finding modern Philgas cooking cheaper than obsolete methods.

Installation Charges

The Standard two-cylinder system can be installed for $14.75. The DeLuxe system with an almost human device which automatically switches the gas supply from an empty cylinder to the full reserve cylinder (giving uninterrupted gas service) can be installed for $19.75. All Philgas equipment remains the property of the company.

Underwriters Listed

Philgas Self-Service equipment has been tested and listed as "standard" by the Underwriters' Laboratories of the National Board of Fire Underwriters, and therefore has no effect on insurance rates.

Availability

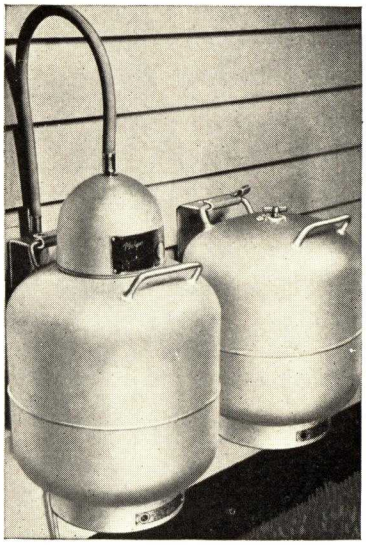
Philgas Self-Service is available in portions of Michigan, Indiana, Illinois, Wisconsin and Iowa. Distribution facilities are being expanded. Communicate with PHILGAS DEPARTMENT, PHILLIPS PETROLEUM CO., General Motors Building, Detroit, Michigan, for information on nearest authorized Philgas Self-Service dealer.

Data and Information

Philgas equipment must be placed (a) outside of building (b) above the ground (c) and at least 5 ft. from any opening in building which is below top of equipment. Equipment can not be completely enclosed but may be masked by shrubbery or removable latticework.

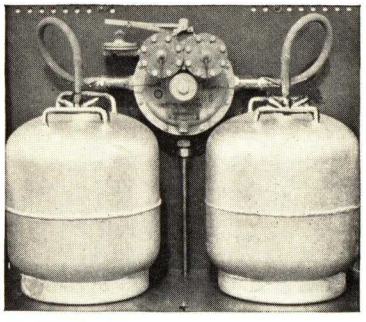
Dimensions—Cylinder 14¾ in. high, 12¼ in. diameter; wall space required by Standard system 30 in. high, 26 in. wide.

Authorized Philgas Self-Service dealers sell appliances especially manufactured for high operating efficiency with Philgas. All appliances for use with Philgas must bear the American Gas Association Testing Laboratory Seal of Approval for *propane gas*. Installation of equipment and piping to be done by local authorized Philgas Self-Service dealers.



Standard System

A simple, fool-proof installation consisting of two cylinders (one in use, one in reserve), two brackets, two locks, gas regulator and flexible connector, and copper tubing to appliances. When one cylinder is exhausted, the connector is merely unscrewed from the empty cylinder and connected to the full one. No wrenches required. An additional cylinder or cylinders, for extra reserve capacity, can be installed for an extra charge.



DeLuxe System

An almost human robot automatically changes the gas supply from an empty cylinder to a full one, giving uninterrupted gas service. An indicator mounted in the kitchen shows when the reserve cylinder is in use, and reminds the user to replenish the reserve supply the next time she goes to market.

ESTABLISHED 1864

TIRRILL GAS MACHINE CORPORATION

19 Rector Street, NEW YORK, N. Y.

WORKS: NETCONG, N. J.

THE TIRRILL GAS MACHINE

Generates and Delivers at Low Cost a Steady Supply of Non-poisonous Gas

Applications

Gas produced by the Tirrill Gas Machine burns smokelessly with a brilliant white or a hot blue flame as may be desired, and without odor.

It is suitable for all industrial purposes and for cooking, heating and lighting purposes in residences, laboratories, hospitals, colleges, factories and for small municipal gas plants in communities not provided with gas.

Operation

The machine consists of three simple units: *Air Pump, Gas Generator, Mixer.*

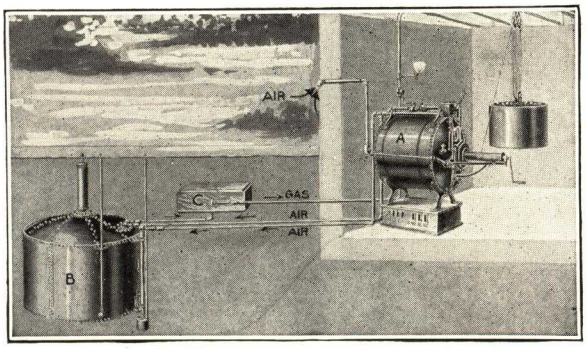
Air Pump and Meter (A)—This unit furnishes the necessary air and pressure to deliver the gas. This pump is operated by a suspended weight wound up by hand, by means of water pressure, water wheel, automatic electric motor or Aerometer type (see at right).

Gas Generator (B)—The gas generator, with inside carburetor and float, acts as a reservoir for the liquid gas and mixes air with .the vapor of the liquid, forming a permanent gas.

Mixer (C)—The mixer functions to thoroughly mix or equalize the vapor from the generator with a given quantity of air from the air pump, thus insuring a supply of smokeless, high heat value gas of uniform quality.

Tirrill Electric Aerometer Type—Consists of the Aerometer and Generator and positive blower, motor driven. This type is much simpler than the weight type, requires less room, is less cumbersome, and has no weights for operating it. It also has the advantages of delivery gas at much higher pressures than the weight type.

The aerometers are made in sizes capable of furnishing maximum gas output of the plant for a period of some 3 to 5 minutes between periods of operation of the motor driven pump. The aerometer may be made to give any pressure desired within a wide range. Write for our new bulletin on the Aerometer Type Machine, also blueprint and specifications.



The Tirrill Gas Machine

FIVE IMPORTANT ADVANTAGES OF THE TIRRILL GAS MACHINE

1. Safety

The machine mixes the gas outside the building underground. It makes a gas that contains no carbon monoxide; hence it is absolutely non-poisonous. It produces and distributes the gas noiselessly and requires no heat to operate it. In producing this gas no dangerous high pressures are used.

Tirrill gas apparatus is listed by the National Board of Fire Underwriters as Standard Class "A" equipment, and its installation does not increase insurance rates.

2. Economy

The cost of Tirrill gas is much lower than that of any other compressed or liquid gas. Under average conditions in the United States, the amount of Tirrill gas equivalent in heating value to 1000 cubic feet of average city gas is produced by the Tirrill gas machine for $1.00 to $1.25. This is cheaper than any bottled gas and cheaper than city gas as sold in many communities.

3. Simplicity

The apparatus is easily installed and connected up to any existing gas piping. Any pipe fitter can install the apparatus in a short time by following the instructions for erection. It requires no attention beyond an occasional (once or twice a year) filling of the generator tank with the Tirrill liquid gas.

As the tanks have a considerable capacity, frequent fillings are not required as is the case with bottled gas.

4. Efficiency

The Tirrill gas machine gives positive, continuous service—the gas being automatically made only as needed and no made gas being stored. The opening of a burner cock to a stove, heater, or any other appliance connected to the pipe system, starts the generator making gas, and the shutting off of the burner cock automatically stops the generator making gas. Variations in temperature have no effect on the efficiency of the gas machine's operation.

5. Durability

As only the highest grade materials and workmanship are employed—once installed, the system requires no upkeep or repairs. There are many Tirrill gas machines in use today which were installed thirty or forty years ago, and these are still giving perfect satisfaction to their owners.

CAPACITIES AND SIZES OF TIRRILL MACHINES

Machine No.	2	3	4	5	6	7
Gas delivered per hr. cu. ft.	300	400	550	850	1100	2500
Gas pressure ... in.	2	2½	2½	2¾	3¼	3½
Equalizing pressure Meter (A):						
Length ... in.	56	64	70	75	86	97
Height ... in.	45	47½	47½	57	61	61
Diameter ... in.	29	35	35	42	48	48
Weight box:						
Height ... in.	24	24	24	24	24	24
Diameter ... in.	26¼	34½	39½	44	52½	60¼
Total weight for loading weight box ... lbs.	1000	1250	1550	2400	3500	4500
Note: We can supply CI counterweights in place of weight box where desired.						
Generator (B):						
Height (with dome) .. in.	68	69	70	80	82	96
Diameter ... in.	45	53	59	65	75	100
Capacity ... gals.	200	250	300	500	700	1250
Mixer (C):						
Height ... in.	12	14	14	14	15	18
Diameter ... in.	42	46	46	46	52	65
Shipping weight ... lb.	1222	1500	1775	2260	3475	4000

Aerometer—Dimensions, etc., special upon receipt of specifications.

Industrial Installations

Where gas is required for operating industrial plants, and where electric power is available, a blower may be installed and be used in place of the *Air Pump* "A," *Mixer* "C" and the *Weight Box.*

Installation Service

The Tirrill Corporation is prepared to undertake the installation of its gas machines by experienced service men, or to refer customers to reliable local firms who will undertake the work.

MEMORANDA

SWEET'S
CATALOG
FILE

1938

HEATING & AIR CONDITIONING 26

PLUMBING & BATHROOM EQUIP. 27

KITCHEN & SERVICE EQUIP. 28